

5TH INTERNATIONAL CONFERENCE MISHEEL INSTITUTE-2023



TFICMI-23

2023.05.26~27 SEOUL, SOUTH KOREA



**MONGOLIAN UNIVERSITY OF SCIENCE
AND TECHNOLOGY**
SCHOOL OF TECHNOLOGY IN DARKHAN-UUL

ISBN:978-9919-24-786-7



Call for the papers

“The Fifth International Conference of Misheel Institute 2023”

26~27 May, Seoul, South Korea

Welcome to the International Conference for Researchers

TFIC-MIYR- 2023 is being organized by:

- Misheel Institute for Young Researchers (MIYR)
- School of Technology in Darkhan-Uul, Mongolian University of Science and Technology

Aim of the conference:

The conference aims to build an international platform for the researchers to share their research findings with global audience, to improve the connection between theoretical and practical knowledge, to offer a networking opportunity for researchers and industrial participants, company representatives, to open opportunities to participate in projects and programs.

International Conference for Young Researchers welcomes submissions on areas including (but not limited to):

- Topic 1.** Information Technology
- Topic 2.** Bio Technology
- Topic 3.** Humanities
- Topic 4.** Physical sciences and Engineering
- Topic 5.** Health sciences
- Topic 6.** Social sciences
- Topic 7.** Environmental sciences/Geology
- Topic 8.** Others

General evaluation criteria for the best work:

- ✓ Theory and methodology used for the research is appropriate and scientific
- ✓ Methodology used for the research is clear and data used for analysis are appropriate
- ✓ Suggested idea/solution is practical
- ✓ Presentation can be prepared by group or individual researcher. Has to have a supervisor.
- ✓ Presentation should be 15minutes, 5 minutes Q&A session in ppt format.
- ✓ Article writing standards of the institute has be strictly followed

Important Dates:

- Abstract submission deadline(1-2p): ***April 11, 2023***
- Full paper submission deadline(8-15p, MC-Word): ***April 30, 2023***
- Conference dates: ***May 26~27, 2023***

All Award /Gifts and certificates all presentations/

Grand Prize Award: Certificate and 400,000tugrug

Doctorate student awards:

- First Prize 300.000 tugrug
- Second Prize Certificate and 250.000 tugrug
- Third Prize Certificate and 200.000tugrug

Master student awards:

- First Prize 300.000 tugrug
- Second Prize Certificate and 250.000 tugrug
- Third Prize Certificate and 200.000tugrug

Conference committee:

- Ph.D. Gantumur Khongorzul, lecturer, Department of Industrial Management, Gyeongsang National University, South Korea, Misheel Institute Founder.
- Ph.D WonJong Kim, Assistant Professor, Department of Industrial Management, Gyeongsang National University, BERI, South Korea, Misheel Institute Board Member.
- Ph.D. Doctorant Ha Jang Su, Professor for industry collaboration purpose, Gyeongsang national university leaders in Industry-University Cooperation 3.0, Misheel Institute Board Member.
- Ph.D. Doctorant Batmunkh Shurentsetseg, Department of Industrial Management, Gyeongsang National University, South Korea, Misheel Institute Board Member.
- Ph.D. Choijin Zolzaya, Associate Professor, Head english Department, School of Foreign Languages, Mongolian University of Science and Technology, Misheel Institute Board Member.
- Ph.D U.Bolorchimeg, Department of Sociology, Onseok University, Misheel Institute Board Member.
- Ph.D G.Urandelger, Associate Professor, Marketing and Trade Department, Business School, National University of Mongolia, Misheel Institute Board Member.
- Ph.D G.Nyamsuren, Associate Professor, Department of Humanies, School of Applied Sciences, Mongolian University of Life Sciences.
- Ph.D. B.Sarantuya, Senior Lecturer, Department of Livestock product Quality and Safety Monitoring and Inspection, School of Animal Science and Biotechnology, Mongolian University of Life Sciences
- Ph.D. M.Khishig-Undrakh, Associate Professor, Institute for Teacher Development Research, Mongolian State University of Education.

Supporting Organization:

- Misheel Institute of Young Researchers
- School of Technology in Darkhan-Uul, Mongolian University of Science and Technology
- GME Remittance
- TOPIC CENTER Korean Language Academy
- GG Tour
- Mongolian Students Association in Busan

Participating universities:

- Gyeonsang National University (South Korea)
- Wonkwang University(South Korea)
- Kangwon National University(South Korea)
- Chung-Ang University(South Korea)
- Incheon National University(South Korea)
- Soongsil University(South Korea)
- University of Freiburg (German)
- Utsunomiya University (Japan)
- Tokyo University (Japan)
- Vietnam National University, Hanoi(Vietnam)
- Inner Mongolia University(China)
- National University of Mongolia(Mongolia)
- Mongolian University of Science and Technology(Mongolia)
- Mongolian University of Life Sciences(Mongolia)
- Mongolian State University of Education(Mongolia)
- Mongolian National University of Medical Sciences(Mongolia)
- University of Finance and Economics(Mongolia)
- Mongolian National University(Mongolia)
- Mandakh University(Mongolia)
- CITI University(Mongolia)
- Erdenet Instiution of Technology(Mongolia)

Please send following documents to misheelinstitute@gmail.com

*Abstract and full paper, *Registration fee receipt, *Application form

Phone Number: 010-8519-2072/Korea/, 7785-8388/Mongolia/

“5- дугаар Олон улсын хаврын хурал-Мишээл хүрээлэн 2023”

5- дугаар сарын 26~27-ны өдөр, Солонгос улс Сөүл хот

“Залуу Судлаачдын Мишээл Хүрээлэн”-гээс зохион байгуулж буй олон улсын болон монголын их дээд сургуулиудын магистр, докторант мөн залуу судлаачдын дунд эрдэм шинжилгээний шилдэг илтгэл, бүтээлийг шалгаруулах “5- дугаар Олон улсын хаврын хурал Мишээл хүрээлэн 2023” нь 2023 оны 5- дугаар сарын 26-27нд зохион байгуулна.

Хурлын зохион байгуулагчид:

- Залуу судлаачдын мишээл хүрээлэн ТББ
- ШУТИС- Дархан уул аймагдахь технологийн сургууль

Хурлын гол зорилго: Оюутнуудыг Олон улсын судалгаа шинжилгээний ажилд идэвхитэй оролцуулах, тэдний эрдэм шинжилгээний ажил, бүтээлийг нийтэд таниулах, дэмжих, бүтээлч сэтгэлгээг бий болгохоос гадна багш оюутны хамтын ажиллагааг хөгжүүлэх, онол практикийн мэдлэгийн уялдаа холбоог сайжруулах, оюутнуудын бүтээлийг ажил олгогчдод танилцуулах, төсөл хөтөлбөрт хамруулах боломж бололцоог бий болгоход оршино.

Салбар :

МТ - Мэдээллийн Технологи
БТ - Био Технологи
ХУ - Хүмүүнлэгийн Ухаан
ИТ - Инженер Технологи
АС - Анагаахын Салбар
НУ - Нийгмийн Ухаан
БГ- Байгаль/Газарзүй
ХА - Хөдөө аж ахуй
БС - Бусад салбар

Шилдэг бүтээлд тавигдах ерөнхий шаардлага:

- ✓ Судалгааны ажил нь шинжлэх ухааны онол, арга зүйд үндэслэгдсэн байна.
- ✓ Судалгаа шинжилгээний тодорхой арга зүй, арга техникийг хэрэглэсэн байхын зэрэгцээ тооцооллыг бодит өгөгдөл дээр тулгуурлан хийсэн байна.
- ✓ Илтгэлд дэвшүүлсэн санаа оновчтой, практикт хэрэгжих боломжтой байх.
- ✓ Илтгэлийг ганцаарчилсан болон багаар бэлтгэж болох бөгөөд заавал удирдагч багштай байна.
- ✓ Илтгэлийг PPT хэлбэрээр бэлтгэх ба илтгэх хугацаа 15 минут, хэлэлцэх хугацаа 5 минут байна.
- ✓ Өгүүллийг хүрээнлэнгийн “Өгүүлэл бичих стандарт”-ын дагуу бичиж ирүүлнэ.

Өдөр:

- Хураангуй авах хугацаа(1-2р): **2023-04.11**
- Бүрэн өгүүлэл авах хугацаа (8-15р, MC-Word) : **2023- 04.30**
- Хурал болох өдөр: **2023-05.26-27**

Шагналт байр /Оролцсон бүх илтгэлүүд гарын бэлэг батламж дагалдан очно/

Grand Prize Award: Батламж болон 400,000төгрөг

Doctorate student Awards:

I байр Батламж, 300.000 төгрөг

II байр Батламж, 250.000 төгрөг

III байр Батламж 200.000төгрөг

Master student Awards:

I байр Батламж, 300.000 төгрөг

II байр Батламж, 250.000 төгрөг

III байр Батламж 200.000төгрөг

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- Mongolian National University(Mongolia)
- Mandakh University(Mongolia)
- CITI University(Mongolia)
- Erdenet Instiution of Technology(Mongolia)

Судалгааны ажлын хураангуй 1ш, бүртгэлийн хураамжийн баримт 1ш, Анкет 1ш-ын хамт misheelinstitute@gmail.com илгээнэ. Холбоо барих:010-8519-2072/Солонгос/, 7785-8388/Монгол/

THE FIFTH INTERNATIONAL CONFERENCE MIYR 2023

26~27, MAY, SOUTH KOREA SEOUL

TFIC-MIYR- 2023 is being organized by:

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Conference schedule

A 1. Group Online Presentation (5/26)

Section 1. Education Science

/Mongolian time/

09:00~09:10	Participant registration	
	Batchimeg Munkhzelter /Misheel Institute/ Nomin Otgonbaatar /Misheel Institute/	
Time Paper ID	Paper Title	Presenter
09:10~09:25	Professor Mijgee Khishig-Undrakh Presentation /Mongolian State University of Education/	
09:30~09:45 (SSED-01)	The version of model for assessment of reading ability of 9 th grade students	Ganbat Enkh-Otgon Chuluundorj Byambakhand Jagdag Davaa
09:50~10:05 (SSED-02)	Peer instruction method influence on learning quality	Bal Enkhtsetseg
10:10~10:25 (SSED-04)	Secondary school students' attitude towards Mongolian dance (bii biyelgee)	Batjargal Otgontsetseg Jagdag Davaa
10:30~10:45 (SSED-10)	Study on the psychological behavior of a codependent family member of an alcoholic	Baasansuren Byambanorov Tumurtogoo Altangerel Sharavdorj Erdenechimeg
10:50~11:05 (SSED-11)	Improving Students' Listening Skills through TED Talks	Amar-Amgalan Natsagdorj Gereltuya Dampil
11:10~11:25 (SSED-15)	Making student's knowledge to application through problem solving learning technology	Galsan Tsendmaa
11:30~11:45 (SSED-26)	Comparing intellectual level between autism spectrum disorder and normal children	Dorjbat Davkharbayar
11:50~12:10 Coffee Time		

A2. Group Online Presentation (5/26)

Section 2. Education Science

/Mongolian time/

Time Paper ID	Paper Title	Presenter
12:10~12:25 (SSED-41)	The results of the inspection of the financial statements of the public organizations /In the case of Darkhan-Uul aimag/	Shijirbaatar Narantungalag Yanjmaa Battsetseg Ayushbaatar Munkhzul
12:30~12:45 (SSED-44)	Reflecting children's stages of cognitive development in career-guidance activities	Eldev Ochir Otgon Erdene
12:50~13:05 (SSED-45)	On The issue of preparing counselors in career guidance	Tegookhuu Enkh Amgalan
13:10~13:25 (SSSS-13)	Research on the impact of work stress on psychological health	Gantumur Gereltnaran Pagvajav odgerel
13:30~13:45 (SSED-03)	Educational games. Developing engineering mentalities using educational applications	Bal Enkhtsetseg
13:50~14:05 (SSED-12)	Linguistic Characteristics of National Mentality	Tumurtogoo Altangerel, Baasansuren Byambanorov
14:10~14:25 (SSED-37)	A Study on the emotional intelligence of adolescents	Sandagdorj Tamir Pagvajav Odgerel
14:30~14:45 (SSED-24)	A study based on cognitive theory to improve the result of mathematics lessons	Urtnasan Munkhtsetseg
14:50~15:10 Coffee Time		

A3. Group Online Presentation (5/26)

Section 3. Social Science

/Mongolian time/

Time Paper ID	Paper Title	Presenter
15:10~15:25	Professor WonJong Kim Presentation /Gyeongsang National University, South Korea/	
15:30~15:45 (SSSO-09)	A Study of some factors affecting Marital Satisfaction	Ulzii Batbayar Delgerjav Munkhnasan
15:50~16:05 (SSIT-17)	The survey of current labor market in Mongolia	Amgalan Undrakh
16:10~16:25 (SSOT-29)	A study of factors impacting quarter-life crisis in early adulthood	Enkhsaikhan Onon Delgerjav Munkhnasan
16:30~16:45 (SSCS-40)	A comparative study of value orientations and life style of students of the first and fourth year of School of Technology in Darkhan-Uul aimag	Dariimaa Dungaamaa Bat-Ulzii Suvd-Erdnene
16:50~17:05 (SSOT-60)	The research on using interactive methods in teaching to improve the result of the general entrance examination (On case of the 12th grade social science subject in lyceum high school of Technology school in Darkhan)	Jyekyei Kalamkhas
17:10~17:25 (SSOT-43)	Opportunity study for implementation of occupational health and safety standards	Yanjmaa Battsetseg Tsendeelee Ganbaatar
17:30~17:45 (SSOT-48)	A professional study aimed at comprehending the factors and circumstances contributing to bullying and harassment within educational settings, along with strategies for effective resolution	Damdin Nomuunzaya. Orolmaa Munkhbat
17:50~ Last Greeting		

B1. Group Online presentation (5/26)

Section 1. Languages Science

/Mongolian time/

09:00~09:10	Participant registration	
	Khongorzul Gantumur /Misheel Institute/ Shurentsetseg Batmunkh /Misheel Institute/	
Time Paper ID	Paper Title	Presenter
09:10~09:25	Professor Zolzaya Choijin Presentation /Mongolian University of Science and Technology/	
09:30~09:45 (HSL5-05)	A study of the concept of fate in English-Mongolian texts	Nyamsuren Selenge
09:50~10:05 (HSL5-08)	Comparative Studies on Adverbial Clause Mongolian & English Languages	Badamsuren Ganbold
<del>10:10~10:25 (HSL5-16)</del>	~~Implementing computer-assisted language learning in the teaching of second language listening skill~~	~~Lkhundev Amgalan~~
10:30~10:45 (HSL5-27)	Gender Differences on Color Naming in Mongolian Language	Osorjamaa Nandin-Erdene
10:50~11:05 (HSOT-47)	A Comparative analysis of esp textbook: a case of business english	Bat-Ulzii Suvd-Erdene
11:10~11:25 (SSED-19)	Study on reliability issues of a general entrance exam of English in Mongolia	Bud Odon
11:30~11:45 (SSBA-57)	Service quality at sunny dream Mongolia company	Munkhdelger Nyamsuren
11:50~12:10 Coffee Time		

B2. Group Online presentation (5/26)

Section 2. Business Science

/Mongolian time/

Time Paper ID	Paper Title	Presenter
12:15~12:30	Professor Ha Jang Su Presentation / Gyeongsang National University, South Korea/	
12:35~12:50 (SSBA-14)	Assessing the financial information quality of commercial banks	Baasanjav Bayasgalan, Ginjbataar Enkhtsetseg
<del>12:55~13:10 (SSEC-20)</del>	~~The local government expenditure efficiency analysis towards the human development~~	~~Tumur-Ochir Eldev-Ochir Khurenbaatar Adiyatsogt~~
13:15~13:30 (SSBA-21)	Organizational participation in human development	Nyamjav Tsermaa
13:35~13:50 (SSBA-30)	Some of the supply chain issues and challenges for food production in rural regions in Mongolia	Batkhashig Ishdamba, Enkhtuya Dunkhorol, Battsetseg Dendev
13:55~14:10 (SSBA-31)	A study of the current state of depreciation of non-current assets	Polooj Dorjpurev, Purevjav Elbegzaya
14:15~14:30 (SSBA-36)	The Influence of Korean Vehicles Product Attributes on Consumer Satisfaction in the Mongolian Automobile Market	Tungalagtamir Namuun, Gerelmaa Battumur
14:35~14:50 (SSBA-38)	Analysis on Household financial sustainability, Impacts affecting on: on the example of orkhon province	Tumen-Ulzii Uuganbayar, Davaanyam oyu-Erdene
14:55~15:20 Last Greeting		

B3. Group Online presentation (5/26)

Section 3. Other Science

/Mongolian time/

Time Paper ID	Paper Title	Presenter
15:20~15:35 (SSBA-42)	Study of the possibility of introducing an integrated compliance system in a mining company	Yanjmaa Battsetseg Tsenedeelee Ganbaatar
15:40~15:55 (SSBA-56)	Social impact assessing of entrepreneurs in Ulanbaatar city and aimags	Altantsetseg Purevdulam Ganbaatar Altantovch Altangerel Nandin-Erdene
16:00~16:15 (NGEE-18)	Effects of solar radiation on agriculture area of Selenge province, Mongolia	Erdeneschoo Orolmaa Sanjaa Tuya
16:20~16:35 (SSEC-22)	Adaptability to climate change	Dashjamts Ariun-Erdene, Navaandamba Khajidsuren, Budjav Uuganbayar
<del>16:40~16:55 (NGEE-28)</del>	~~Ferrosilicon Producing Technology Using Domestic Mineral Raw Materials~~	~~Erkhembayar Tseveen Delger Gonchig Purevsuren Biidaabazar Khosbayar Erkhembayar Uulambayar Bayarsaikhan~~
17:00~17:15 (NGCH-34)	A Result of some chemical and biochemical parameters of yak meat	Tserenkhand Zorigtbaatar Tumurtogtokh Erdenetsogt Damdinsuren Dorjoo Erkigul Bukyei Enkhjargal Buyandelger
17:20~17:35 (NGCH-35)	Mongolian meat export: food safety	Zorigtbaatar Tserenkhand Badarch Khishigdavaa
17:40~17:55 (NGOT-58)	Effects of radial growth rate on juvenile wood properties of Pinus sylvestris planted in Mongolia	Batsaikhan Ganbaatar Futoshi Ishiguri Ikumi Nezu Jyunichi Ohshima Shinso Yokota Bayasaa Tumenjargal Gerelbaatar Sukhbaatar
18:00~ Last Greeting		

<http://youngres.com>

Poster Presentation (5/27)		
Paper ID	Paper Title	Presenter
ITES-07	Some results of welding technology using HSLA Q550	Khaltar Khureltogoo
SSED-25	Fesibility study of the translation of some technical terms used in English textbooks (on the example of English verbs)	Dorjbat Khugjmaa
ITES-32	Comparative Analysis of Probability Theory and Mathematical Statistics course for engineering students	Purevtseren Nyambayar
SSED-39	The Correlation between Entrance Exam and Students' Performance at School of Technology in Darkhan-Uul, MUST	Ser-Od Odtsetseg Bat-Ulzii Suvd-Erdnene
HSOT-46	Analysing Business Management Students' English Needs in School of Technology in Darkhan-Uul, MUST	Bat-Ulzii Suvd-Erdnene

South Korea, Seoul 2023.05.27

Oral presentation

/Korean time/

13:00~13:20	Participant registration		
13:20~13:30	Otgonduu Sugir /Misheel Institute/ Khongorzul Gantumur /Misheel Institute/		
Offline presentation in Seoul (5/27)			
Time	Paper ID	Paper Title	Presenter
13:30~13:45		A Study on the impact of life long education program on the quality of life for elderly	Invited presentation by Ph.D Bolorchimeg Uranchimeg
13:50~14:05 (HSTA-06)		Research on tourism tendencies and MICE skills affecting MICE participation restrictions	Otgonbayar Seung Koo Lee
14:10~14:25 (SSBA-50)		Some issues of waste management in Mongolia	Batmunkh Shurentsetseg Gantumur Khongorzul
14:30~14:45 (SSBA-51)		The Effect of Senior Entrepreneurs' Entrepreneurial Competence on Program Participation Intention: Mediating Effect of Entrepreneurship Intention	Otgonbaatar Nomin Gantumur Khongorzul WonJong Kim
14:50~15:10 GME Co., Ltd Introduction and Coffee Time			
15:10~15:25 (SSEC-52)		A Study of Factors Determining Economic Growth and Women's Labor Force Participation Rate in Developing Countries in Asia: An Empirical Analysis	Amarjargal Gandolgor
15:30~15:45 (OTFM-23)		Plant-based diet and coronary heart disease risk in Korean adults: A prospective cohort study based on the Health Examinees (HEXA) Study	Khongorzul Ganbat Bayarmaa Nasan-Ulzii Sangah Shin
15:50~16:05 (SSSS-61)		The effects of person job fit and person supervisor fit on turnover intention: Moderating effects of career satisfaction and career adaptability	Baterdene Munkhgerel Kwak WonJun Chung WonJoon
16:10~17:00 Last Greeting and Coffee Time			

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SSED-01

The Version of Model for Assessment of Reading Ability of 9th Grade Students

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Abstract: In order to develop the reading ability of middle school students in the current days, the content of texts for reading must conform to the students' age peculiarity and interests and shall have perfect sense. The versified or poetical texts shall be written in type of fiction at first. The contents of the texts purposed for additional reading are the summary of adventurous literature. When assessing the student's ability to read such texts, the Bloom's taxonomy (Bloom, 2020) needs to develop the assessment model based on the cognitive actions. The main goal is to reveal the scientific knowledge, work pieces, abstract knowledge, the ability to understand and explain the knowledge and skills, apply what he/she understands, summarize, analyze, classify, and apply knowledge and skills. Therefore, the issue of working out the criteria parameters for comprehensive assessment of learning-teaching activities not only connecting the knowledge, skills, and attitudes of 9th grade students to the learning methods using the subject of Mongolian language is becoming an utmost important issue in the current days of highly developed science, technology, information, and communication, and thus, we have worked out the version of model assuming that the Bloom's taxonomy can be used to assess the students' reading ability in preparation of students for PISA (Programme for International Student Assessment).

Keywords: reading ability, assessment, Bloom's Taxonomy, middle school students

Introduction

The reading ability is not only inseparably connected to the psychology, education study, and language education, but also, it is surveyed from the point of brain science (Cognitive Psychology) on how the humans perceive the information at their own cognitive level during the reading process, comprehending, and how they creatively express ideas in speech and writing. For example, it has been studied what human abilities are involved in the reading process, how they are interconnected, and which part of the brain receives and responds to information when reading (Ordetx, 2021). It can be said that the reading ability is a multi-function of the brain (diversity of brain), and the need to connect and use other types of knowledge and abilities arises to read and understand the text. Therefore, the ability to read and understand is an ability that is formed by many connections that exist in the intellect.

Reading strategies and competence are pre-planned conscious ways to help students solve problems while reading the text. It includes picturing the content of the text based on the primary words while reading, and using images included in the headings and texts, and other types of visuals. (Равдан, 2013)

Also, the main attention is paid to correctly choosing the right language materials, which directly depends on the learning goals. The spoken and written languages differ significantly from each other, and thus, it was believed that reading and writing can be taught on the similar material with a fairly simple structure within the scope of 500 words at the beginning stage. For instance, it was stated that 1200 words to teach spoken language and 3000-5000 words for reading. It is used to select active and passive vocabulary in modern teaching methodologies. The critical importance in teaching to read lies in choosing the text, and in a relation to this choice, the following issues have been developed (Michael, 1960):

- At the beginning of training, the text with correct stylistics and compositions that can create positive attitudes to the students shall be used.

- Reading the original and performing the task depend on how students understand what they read. Therefore, students aims at understanding what they read.

- Having an interest in reading original text in the textbook is of great importance. It is based on the students' language knowledge involving a new understanding of that certain language on one aspect and on the other, original text includes the use of extracurricular reading materials.

- The content of original text should match to the age, mentality, and interests of the students. Therefore, the reading text must have perfect meanings. The versified or poetical texts may be written in type of fiction at first. The contents of the texts purposed for extracurricular reading are the adventurous literature.

The possibility to use the above steps for choosing the text for reading in Mongolian language training.

The scientist M. West divided the reading forms into two types, observing or reading by observing every word, and reading by searching or scrolling through text to find a specific meaning. For instance, observing the meaning of each word when reading 400 words per minute. And, the other type of reading relates to adult readers, and the reading speed shall be 1200 words per minute. The main goal of the training is to develop the ability to scroll through by searching. Therefore, reading is a valuable thing, and thus, it should be developed in parallel from the moment the training begins. Michael said "reading is a habit, and such habit is formed as a result of practice. (Michael, 1960)

The process of assessing a student's academic achievements comparing to a specific criteria (results) developed orienting on the formation of knowledge, skills, and attitudes to be possessed as a result of learning is called a criterion-based assessment. In other words, it is the process of evaluating and concluding a student's performance only with evaluation criteria, not with other students. The evaluation criteria:

- Teaches how to determine the student's performance consistent with learning outcomes.
- Becomes a brief expression of what a student is able to do to demonstrate how successfully he/she reached the learning outcomes.
- Aims to create clear and unambiguous proof that student has reached each learning results.

There are parameters in the research papers concluding the questionnaires taken from readers on reading strategies by summarizing them. The parameters divided mainly the unified whole concept "reading and comprehending" into sub-sections as:

- Understanding the meaning of words,

- Understanding and interpreting the words within contexts,
- Discerning and understanding the letters' and writing symbols,
- Drawing conclusions,
- Distinguishing and comprehending the principles from the examples given,
- Ordering the idea of the text according to the plot development,
- Setting the orders of narrative actions.

Therefore, the assessment and scaling of 9th graders' reading abilities can develop reading abilities on the one aspect and on the other, each level of reading comprehension and cognition, and thus, using the Bloom's taxonomy in training has theoretical and practical importance.

Bloom's taxonomy (Bloom, 2021) is based on cognitive actions, and has been formulated in detail to identify the above abilities of learners. The main goal is to reveal the scientific knowledge, work pieces, abstract knowledge, the ability to understand and explain the knowledge and skills, apply what he/she understands, summarize, analyze, classify, and apply knowledge and skills.

Therefore, the issue of working out the criteria parameters for comprehensive assessment of learning-teaching activities not only connecting the knowledge, skills, and attitudes of 9th grade students to the learning methods using the subject of Mongolian language is becoming an utmost important issue in the current days of highly developed science, technology, information, and communication, and thus, we have worked out the version of model assuming that the Bloom's taxonomy can be used to assess the students' reading ability in preparation of students for PISA (Programme for International Student Assessment).

The following model is used in Mongolian language teaching methodology by creatively using the previous and revised forms of Bloom's taxonomy. (Bazarragchaa M. & Byambakhand Ch., 2014)

[Table 1] A model to creatively use the taxonomy in training

№	Bloom's taxonomy (1956)	Revised Anderson's taxonomy (2001)
1	At the level of possessing the knowledge, remembering original text complex, beginning, main part, end, topic, and perfect idea.	Make conversations about original text that was previously studied at the level of remembering
2	At the level of understanding Compare original text that is being read with another original text, present the perfect ideas with proverbs, or express the idea of original text with concise phrases.	Explain, and clarify the perfect ideas of the events of original text, express your own ideas, imagine the end and plot at the level of understanding: 1. Topic (title or heading of original text)-main part-perfect idea 2. Beginning – main part – end
3	Use one's understanding at the application level in different situations in different examples	Write similar or different texts according to the template given at the application level. For example, the following original text can be written and spoken in detail: (yellow sun and ordinary days)

4	Discuss by splitting original text into complexes at the analyzing level and discuss by finding the connections or interrelations.	The template or model such as whole part, beginning, main part, and end can be used at the level of analysis and synthesis.
5	At the level of synthesis, combine the novelty, and find the perfect idea of original text, and find the phrases appropriate for the perfect idea.	Imitating and composing on certain topic at the assessment level, preparing a plan, solving a problem or topic. For instance, A man worries for strangers (Black man for yellow man) If the administrative cannot be settled down Their subordinates can't (When higher ups cannot find their seats Their subordinates can't run) If one is slandered All the community will be related (If a cattle's horn is hit A thousand cattle's horns shake)
6	Evaluate the meaning, reasons, and picturing of original text and find out the importance of reading original text for a specific purpose at the level of assessment	Evaluate and conclude the composition of original text and become interested in composing original texts at the creation level

Based on this, considering the model of researchers M. Bazarragchaa and Ch. Byambakhand who are using the traditional (Bloom, B. S.; Engelhart, M. D.; Furst, E. J.; Hill, W. H.; Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Vol. Handbook I: Cognitive domain. New York: David McKay Company*) and revised versions (Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing, Abridged Edition. Boston, MA: Allyn and Bacon.*) of Bloom's taxonomy in Mongolian language teaching by comparing them, the following model with cognitive verbs can be used to evaluate the reading ability of 9th grade students based on their cognitive levels. For example,

[Table 2] Model for reading ability assessment

№	Externally directed cognition (EDC) (real)	Internally directed cognition (IDC) (abstract)
1	Remembering (1) At this level, the student reads original text and: A. Improve your reading abilities if you are re-reading original text you have read before	Analysis and synthesis (4) At this level, while reading original text, the student should: A. Sort out things that are different from previous knowledge, summarize similar aspects, and create a single concept

	B. Remember the knowledge you have gathered before, and distinguish the beginning, middle, and end of original text after reading original text.	B. While reading, distinguish original text in whole, and recognize the connections between words and sentences in original text
2	Understand (2) What is the idea presented in original text, and understand the meaning of the phrases and expressions in original text	Evaluate (5) Compose an original text with the similar topic based on new ideas and conclusions from original text, and express the ideas of original text that you have read using phrases
3	Apply (3) Compose original text with the similar topic with original text you have read	Create (6) Enrich the text based on your new knowledge or share your impressions with others

Based on the level of Bloom's taxonomy, L. Tudev's "Sheep" was selected from the textbook being studied in the 9th grade of "Mongolian language" as original text, evaluation materials were developed using Bloom's taxonomy, and standard tasks were designed.

- **Standard original text: L. Tudev "Sheep"**

... One thousand five hundred or even more years ago, Mongols used to keep remembering the beneficence of their sheep and erected monuments for them... A white sheep with huge round horns attended the monument complex in Hanui and Hunui basin. It still exists.

Why did ancestors erect marble statues for their sheep? Why is the sheep's head put on the funeral memorial headstones of the gods and the ancestors?

Isn't the sheep the secret idol of our Mongols? Isn't the sheep a secret guardian of the fact that Mongols have never been extinguished the heirlooms, and have never lost their kinship?

But, how well do Mongols know sheep and shepherds?

Scientists assumed that the sheep might be and thus, silly, and investigated her from different aspects, they reached a surprising discovery. Scientists at the Cornell University of America have taught the sheep a lesson, then the sheep demonstrated that she has an IQ of 50 and possess the skills to learn better than humans. Also, it was revealed that sheep is an animal that has the ability to distinguish the color, shape, and shape of forage very well.

It is even more surprising that the number of sheep herds in Mongolia has been decreasing in recent years... Let's pray that the heavenly spirit would not leave us while we have been "killing" our sheep and "doing charities". Amon heaven! (2019)

- **At the remembering level:**

The student must perform the following steps while reading:

- When predicting, imagining, interpreting, or thinking about the meaning of a word that you do not know well, find the meaning of the word in the dictionary, and distinguish the meaning of words such as "khoilgo (funeral) – the custom/rite of funeral by burying the livestock together", "sakhiul (guardian) – a person who is responsible for taking care of and guarding the things".
- When distinguishing the beginning, main part, and end of original text and finding the interrelations of the meaning, it stated in the beginning part as "... One thousand five hundred or even more years ago, Mongols used to keep remembering the beneficence of their sheep and erected monuments for them.

- A white sheep with huge round horns attended the monument complex in Hanui and Hunui basin. It still exists.” while it stated in the main part of the text as “it was revealed that the sheep is an animal that is a secret idol of our Mongols...” And, at the end of original text, it expressed the tone of questioning, shocking, and comprehending as “it is even more surprising that the number of sheep in Mongolia has been decreasing in recent years...”.

- **At the comprehension level:**

- When explaining and confirming the idea presented in original text, the author stated what knowledge do Mongols have who have been engaged in nomadic livestock husbandry since ancient times, compared that knowledge with the knowledge about the sheep of other countries, and expressed his own idea as “it is even more surprising that the number of sheep has been decreasing...” to make additional comment. Also, when reading original text, discuss the rationality and non-rationality of answers when answering the questions on how the title or heading, main part, and perfect idea of original text are connected.

For example: “When scientists studied sheep from different aspects, what did they discover?”, “Sheep had an IQ of 50 when it was taught and was able to learn better than humans.” Also, it is possible to assess the level of knowledge by asking questions such as “how can you confirm the decrease in the number of sheep in Mongolia in recent years?” and “while we have been “killing” our sheep and “doing charities”.

- **At the application level:**

If the student has read and understood the text “Sheep” by L. Tudev, he/she can be given the task of composing an original text with the topic “Camel”. In doing and thus,, student must be well explained that the original text with the similar meaning with the text he/she has read should be composed. The task of having a student composed an original text with the similar meaning to the original text at the above (external, real) level is a method to assess the level of reading ability within the real/external level of reading ability assessment. It is an external method of assessment. The topics such as “How the Mongols domesticated the camel, one of the cattle since ancient times” and “global desertification” can be discussed.

- **At the analysis and synthesis levels:**

- Understand “making predictions from observations”

It is interesting to determine that how the students understood and how they reached the predictions with grounds resulting from the observations such as ... One thousand five hundred or even more years ago, Mongols used to keep remembering the beneficence of their sheep and erected monuments for them... A white sheep with huge round horns attended the monument complex in Hanui and Hunui basin. It still exists.

- Isn't the sheep the secret idol of our Mongols? Isn't the sheep a secret guardian of the fact that Mongols have never been extinguished the heirlooms, and have never lost their kinship?

Also, select (underline, clarify) and explain the key words in original text - “sheep, statue, Mongols, sky”

- Read and discuss the parts of observations and predictions from original text,
- How did you conclude the main idea of original text?
- Speak and write in your own words how you understand the meaning.

If the student has read and understood in these steps, he/she can write in his/her own words to express his/her ideas correctly.

- **At the evaluating level:**

Do steps such as:

- Express the meaning of original text in idioms and phrases,

- Talk to others what did you understand after reading original text.

- **At the creating level:**

The student can use internal assessment methods to compose the original text by enriching the meaning of original, and talk to others about their impressions after reading the text, and furthermore, he/she can express the ideas by writing original texts starting with a simple, day-to-day topics to scientific thesis. As looking at this example, the above evaluation model shall be used to clarify the understanding of the cognitive level of 9th grade students and evaluate their reading ability. And, when evaluating the X-XII grade students, it will be more efficient if it is modeled to perform more detailed actions within the higher level of cognition.

A specific type of assessment of students' knowledge consisting of a set of questions and that is organized in certain time period is a test and thus, it is a systematic tool of measuring and expressing one or more characteristics of the student using numerical or any of categorical measures. The measurement, on the other hand, shows the results of a test or assessment type in numbers according to specific rules (e.g., counting the correct answers, giving the points, and etc.). It is often defined as scoring. It is the process of determining the ranking according to the established criteria using the evaluation data, and thus, it is necessary to develop the standard original text and perform evaluation.

Therefore, based on the above model to creatively use the Bloom's taxonomy in teaching, we chose the original text of D. Dairijav's "Gobi well engineer is in danger of extinction" from the textbook being studied in the 9th grade of "Mongolian language", and experimented by developing a standard task worksheet to evaluate reading ability.

- **Standard original text: D.Dairijav "The Gobi well engineer is in danger of extinction"**

There are the cases that people of Gobi unjustly treat the khulan – wild ass. Since there are no excessive things in the nature, khulan must have good qualities. The herdsmen dislike the khulan because they eat the grass from the roots. But the khulan, of which the people are badmouthing, waters their livestock and save them from the danger of dying of thirst. Khulan is a Gobi engineer.

This animal can amazingly sense where the underground water level is close to the surface, digs the earth with its sharp hooves and releases the water. This is a well of khulan. The gobi wild animals such as vulture birds, foxes, and wolves drink from the water of such well. In short, it is a wonderful animal that waters others. Moreover, a succulent and poisonous plant – anabasis grows in Gobi. Only khulan eats this plant. So, khulan is not a useless animal to be hated like that.

Khulan is a wild ass that is included in horse family. There are small numbers of khulan habituate in African Savannah, Turkmenistan, Afghanistan, Iran, and Pakistan besides of our country. About 70% of the world's khulan live in our country. Therefore, Mongolia is the core country of khulan in the world. ...Khulan's most important breeding country is Mongolia. In one word, khulan is an unlucky creature. Infrastructural development is taking place in the area where the khulans live. In the beginning of 2000s, there were herds of khulans in Khatanbulag, Khuvsugul soum of Dornogovi, Nomgon soum, Borzong gobi, Zuramtai mountain, and Noyon soum of Umnogovi aimag/province, however, today they are no longer visible. It is resulted from the events on the one aspect that the construction of paved roads, power lines, and water pipes restricted the free movement of khulans to select the grassland and water, and on the other aspect, the increase of human settlements in areas with developed mining and infrastructure has led to an increase in illegal hunting. Also, due to climate change, Gobi's open water has become scarce, its springs have dried up, and plant growth has deteriorated. Such combined factors affect the population of khulans.

It has biologically extreme negative impacts to construct the roads that divide the free movement of the herd of khulan. Animals maintain their genetic diversities and viabilities through reproductions leaving healthy generations/offspring. However, limiting the possibility of breeding by development and constructions means that khulan gets in a lack of genetic variety. As this process continues for a long time, they gradually breed inside the herd, and their ability to cope with environmental conditions, their ability to survive, and the ability to leave offspring deteriorate. Khulan hunting can be prohibited. However, due to lack of genetics, this animal is in danger of becoming extinct due to the biological process. It is difficult to say that we are doing some jobs on the protection of animals listed in the Red Book. The only work done in this area is the government's special protection of the khulan habited areas. ... In general, the activity to fight against illegal hunting is insufficient.

There are about 20,000 khulans in Mongolia. Erdenedalai soum of Dundgovi aimag recently organized a festival of 20,000 horses. One soum is a small place. It means that there is a khulan equal to the number of horses in one soum at the level of the country. If the conservation measures are not taken today and continues to be in such same situation, the khulan will be destroyed by tomorrow. Although humans need infrastructural and economic development, we must develop keeping the nature in our minds. Let's discuss the original text Khulan is a wonderful animal (2019) at the cognitive level. For instance,

- **At the level of remembering:** When reading any original texts at this level, it is important to remember it relating to previous knowledge. While reading the above original text, discuss the main idea of original text that was read on the topic “man-nature, man-water, climate change” and remember comparing the reasons and consequences.
- **At the level of understanding:** Do the actions such as reading the text by distinguishing the reasons and consequences of decrease in the number of khulan, the large migration from the countryside to the city, and from the city to the countryside, and observing the connections between the complexes. Write separately the wordings that confirm the author's evaluation.
- **At the level of applying:** If you read and understand, write the original text on a topic similar to the original. For instance, it can be composed with the topics such as “Mazaalai is in danger of extinction” and “Ice Age” and etc.
- **At the level of analysis and synthesis:** Separate the original text by beginning, main part, and end, replace and compose the connections of each complex, and write down the changes in composition.
- **At the level of evaluation:** Express the meaning of original text in idioms and phrases, compare it with own and others' impressions, and draw conclusions
- **At the level of creation:** Do the actions such as composing the original text by enriching the original idea, and continuing to write the original text.

This survey is based on the experience of preparing the scaled parameters to evaluate the reading and understanding abilities of the students by preparing the teaching materials and evaluation sheets using the Bloom's taxonomy to solve the problems encountered in evaluating the reading ability of 9th grade students of secondary schools.

Within the framework of above cognitive level, the student's reading ability and understanding of what he/she has read is evaluated, and it is observed that Bloom's Taxonomy can be used not only in giving and reviewing the reading tasks in the Mongolian language teaching, but also in writing, speaking, and listening exercises. Moreover, when choosing the topics of original text, we have made the content integration with the sustainable development view, and selected in order to have the students comprehended the

interrelationship of people, nature, and earth. In other words, the students who are studying to possess the fundamental education can apply their own knowledge in the real life in addition to their knowledge and creating ability, and contribute to the goal of sustainable development.

Discussion, Conclusion

The fundamental education curriculum of Mongolian language (Recommendations for application of criteria in the evaluation of fundamental and complete secondary education subjects and learning outcomes, 2021) surveys and determines what types of specific grammarly necessities besides of finding out the interrelations between structure and contents by analyzing the original texts read in the 9th grade such as aiming at providing the students the grammarly knowledge based on original text knowledge, and ability to use it, i.e., making the literary and non-literary texts that are the main tools of Mongolian language teaching as the main teaching materials in the curriculum of basic education in the 9th grade, using the original text that is the main material of Mongolian language teaching by selecting and using it, and suggest it in learning guidelines and textbooks. Furthermore, it is possible to have the students practiced writing original texts matching the structural peculiarity of the read original text, and thus, the 9th grade Mongolian language textbook was used as teaching material according to Bloom's Taxonomy to measure the reading ability of 9th grade students. Accordingly, some learning objectives of the Mongolian language curriculum are whole, and formulated as 9.2a, 9.2b, and 9.2c when they are implemented by each unit lesson. Some of the learning objectives of the curriculum are relatively general to be studied throughout the academic year, and thus, they must be formulated and implemented in detail for each unit lesson, the training plan shall be prepared by the structure of textbook where the contents of 9th grade curriculum divided into units, and the contents of the unit lesson of the textbook shall consist of parts such as reading, grammar, and writing. When performing the assessments at the end of each unit, it would need to develop the steps and creative behaviors to develop the reading ability when working out the tasks and determining the level of knowledge and ability of the students adhering to the assessment criteria developed by us.

References:

- [1] Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing, Abridged Edition*. Boston, MA: Allyn and Bacon.
- [2] Bloom, B. S.; Engelhart, M. D.; Furst, E. J.; Hill, W. H.; Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Vol. Handbook I: Cognitive domain*. New York: David McKay Company
- [3] Bazarragchaa, M. & Byambakhand, Ch. (2014). *Methodology for developing creativity through Mongolian language training*. Ulaanbaatar.
- [4] Davaa, J. (2013). *Pedagogy*. National University of Mongolia, (Jamz, L. & Byambakhand, Ch.) UB: Soyombo Printing.
- [5] Michael, W. (1960). *Teaching English in Difficult Circumstances*. London.
- [6] Ordetx, K. (2021). *What is the Science of Reading? IMSE Journal*. Retrieved from <https://journal.imse.com/what-is-the-science-of-reading>
- [7] Ravdan, E. (2013). *Applied Linguistics*. Ulaanbaatar.
- [8] (2019). *Core Curriculum of Basic Education. improved second edition*, Ministry of Education Culture, Science and Sports., Institute of Education, Ulaanbaatar.
- [9] (2021). *Recommendations for the application of criteria for evaluating basic and secondary education courses and learning outcomes*. Улаанбаатар

SSSED-02

Peer Instruction Method Influence on Learning Quality

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Abstract: In the “Erdenet complex” Institute, instead of the traditional lecture method, students in the field of engineering were taught Peer Instruction (PI) in Mongolian history (S.SS102), and this experiment is described in the article. In other classes, textbooks, revisions, and tests have remained the same in order to keep track of test results. Students' pre-course knowledge was taken through a mock test, while post-course knowledge was taken through a written test. Our research is based on a survey of whether the knowledge of students in the PI method helped them to understand the course better than in the traditional lecture method and whether it can be considered as a teaching method. The responses showed that the students felt more active and engaged in the PI method, but their responses indicated that it was somewhat challenging and difficult. The main problem was that it was difficult to read the course content beforehand.

Keywords: Peer Instruction (PI)1, method2, student learning ability3, student understanding3.

1.Introduction

Despite its many shortcomings, the lecture still occupies a central place in university social science teaching. Lectures tend to add very little to the student's own knowledge and make them passive recipients of information. [1]The use of lectures as the main method of teaching and learning has made the learner a passive recipient of the speaker's knowledge in some form through the student. Furthermore, whether or not a student gains something depends on the student's attitude, and they have to memorize key facts and basic principles, and later on, they don't even understand the basic principles in their brains. [2]

However, in order to make the students' learning activities more effective, it is necessary to provide them with materials that they can work with as creatively as possible, and spend their time on practical work related to the activities they intend to do after graduation. The course is designed around the principles of creativity and aims to motivate the student to achieve. [3]

As illustrated in the Teaching Practices section, subject-based understanding, assessment, and progress testing differ between high schools and universities. [4]

Therefore, the entire content of the university curriculum should focus on the student's very active practice in the course, and it is extremely important to plan for it. We know that the problem that students face is that students learn by memorization, so they have difficulty understanding the deep meaning that the teacher is trying to make them understand in the context of the subject and the efforts of the teacher to involve the student in the learning process. [5] There have been many attempts to keep students engaged, focusing on creating rather than imitating, providing preconceptions rather than procedural understanding, etc. [6]

In many university classrooms, there are very few activities aimed at measuring the level of concept through the use of a Forced Concept Inventory (FCI) or a pretest/reinforcement test. In reality, a significant proportion of students who are taught in traditional ways do not acquire deep knowledge and often drop out

of such courses. Peer Instruction (PI) method was created in the early 1990s by Eric Mazur to increase student engagement and promote understanding and learning. [7]

Since its introduction, its use in history and other subjects has proven to be very effective. Using the PI method, students successfully complete procedural and comprehension tests. According to recent studies, it is believed that the student's learning ability can be doubled using this method. [8]

In today's universities, it has been noticed that many teachers and students do not understand the basics of the subject and cannot explain even simple examples. However, according to primary research, there are no comparative studies or materials in this field. [9]

Therefore, in this study, we decided to measure the knowledge gained within the set of lessons. But when checking their previous knowledge, we took a test. The main purpose of the study is to test using the PI method instead of the traditional lecture method under special supervision in the Mongolian history course, so as to see if the student's learning ability improves and whether the student's understanding of PI is related to the teaching method and learning activities. is to study whether it is possible to become a part. [10]

2.Methodology

Erdenet Complex Institute is located in Erdenet, Mongolia, and is a technological institute that receives more than 90 engineering students every year. Most students take S,SS102 Mongolian History in their first semester. This is a very important and mandatory lesson that forms the basis for the lessons they will study later. At present, students are frequently absent from the course. By the first half of 2022, the cutoff rate was 56 percent.

2.1. Course composition

The package includes a total of 16 lectures (90 minutes), 16 seminars and independent problem solving sessions (90 minutes). Students are assessed by taking a written exam at the end of the course. (9 problems, 5 hours) However, 2 quizzes and 4 seminars are required to advance to the next level. Students attend lectures in groups, but all students are tested at the same time. [7]

Therefore, we conducted the following experiment here.

Only one group of lectures used the PI method instead of traditional lectures, and in the other classes everything was kept the same, and the books, textbooks, and tests were set to be the same for all groups. This will allow us to see the difference between different teaching methods. Before the start of the lesson, we took a quiz to check the students' previous knowledge. So, the group took a test after the lesson and compared the results.

2.1.2. Teaching and learning activities.

In class PI, everything is done in the following order.

1. Preliminary reading. Different reading assignments will be given in each lesson.
2. Reading reports. At the beginning of each lesson, the student explains the most important and important content of the reading according to his understanding. Also, a feature of the reading report section is that students must write about what they do not understand at all.
3. In some cases, the lectures will start with an introduction explaining terms and similar trifles. These explanations will be based on the student's reading reports and will also focus on explaining what the students did not understand. Also, during the explanation, the teacher will activate by encouraging and praising the students who read the topic seriously and wrote a good reading report.

4. Thus, the main teaching and learning activities will begin. The teacher will present multiple-choice questions. Students click on the answer they think is correct. If 30-70% of the answers are correct, ask the students to consult with the people sitting closest to them. Then the teacher will go around the hall to listen to the discussion and give directions to the areas that need help. If most of the students do not get the correct answer, ask them to compare their answer with another group. So, after the discussion is over, press the button again and say the answers one by one. In this way, the answer is more than 70 percent and 90 percent, and the correct answer will be found.

5. After most students have made the correct answer, the teacher will generally explain why the chosen answer was correct and, if necessary, explain why the other choices were wrong.

6. In one 90-minute lecture, we usually find answers to 6-10 questions.

We developed the questions for the subject of the course. Furthermore, we have included proof questions as well as comprehension questions. One important instruction given in the course is that the teacher should not give an answer until the student gives the correct answer. In this case, our explanations and presentations are based only on what the student has expressed, and even the reading report and the answers given by pressing the buttons are purely the student's own attempts and explanations.

3. Form of research and collection of quantitative facts

We looked at both qualitative and quantitative measures to find out whether predetermination is effective in influencing student learning and as a form of teaching and learning. This approach has clearly demonstrated the usefulness of the PI method, and has greatly contributed to our understanding of the teaching and learning of Mongolian history in particular.

3.1. Data Analysis

For quantitative indicators, we have chosen those indicators that are understandable to the general public. Only quantitative data collected during this study were used. Exam results were compared with the student's previous knowledge using 3 types of measures.

3.1.2. Quality indicator

During the course, students answered open-ended questions in 2 cases. One 1 week after the start of the batch and the other 1 week before the end of the batch. In both cases the question was the same.

1. How do you feel about PI as a teaching methodology?

2. Is the PI method helpful in your training? How? If not, why?

in order to find out if students' views on PI change during the course, students entered their e-mail addresses in the questionnaire. The students' answers are anonymous and their registration numbers are kept confidential.

These responses were used to measure qualitative indicators, such as how the students were learning and whether the preliminaries were influencing their learning more than a simple lecture.

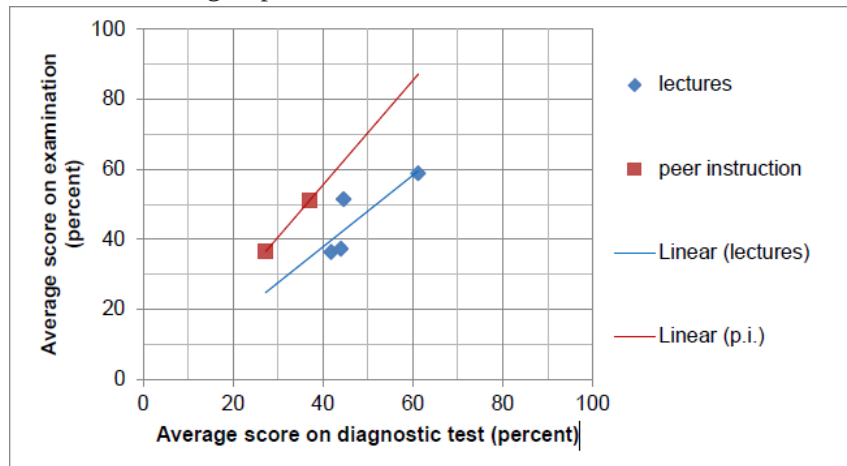
4. Results

4.1. Quantitative results

Test results were compared with the student's prior knowledge using different research programs to generate test results. Because it is biased to only compare prior knowledge, it was measured by 3 different measures: Mongolian history test results and high school graduation grades.

Measuring the students' prior knowledge is inextricably linked to the results of the Mongolian history test taken from all students upon their first enrollment. Figure 1 shows the results of the 6 course exams and their comparison with the test scores

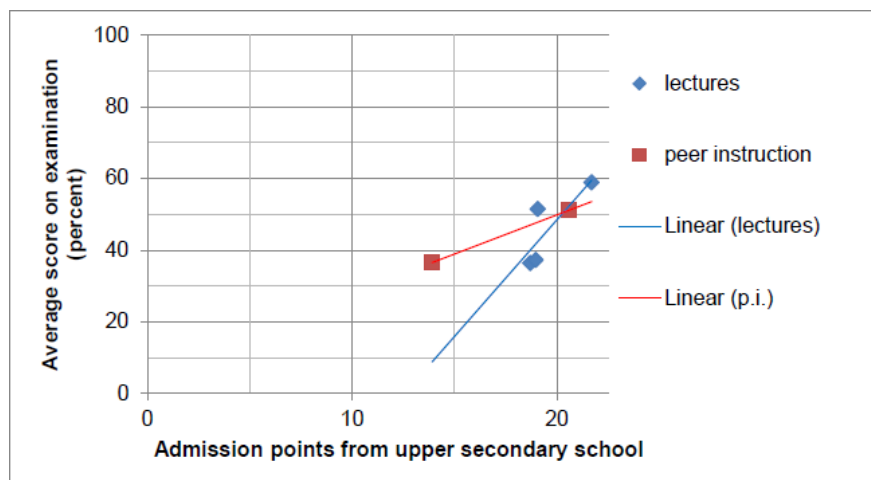
Shows regular lectures and previews online. There is no significant correlation between the line and the score, but it represents the average of the subjects. As shown in Figure-1, it can be seen that our PI group /red/ learned better than normal group /blue/.



[Figure-1]. Average score on diagnostic test(percent)

The average score of the test obtained in 6 subjects /%/ was compared with the test score of the elementary Mongolian history test. The scores are the average grades obtained in different subjects and the lines show the pre-determination /red/ and the traditional lecture /blue/.

Pre-determined course scores were higher than expected compared to test scores. We also compared test scores with enrollment data. Most students compete with high school grades to get into higher education. The number of points allows you to get into the school. Figure-2 shows the comparison of the average score of 6 subjects with the admission score. The curve of the PI group /red/ is higher than that of the normal group /blue/, which indicates that the preset has a good effect on training.

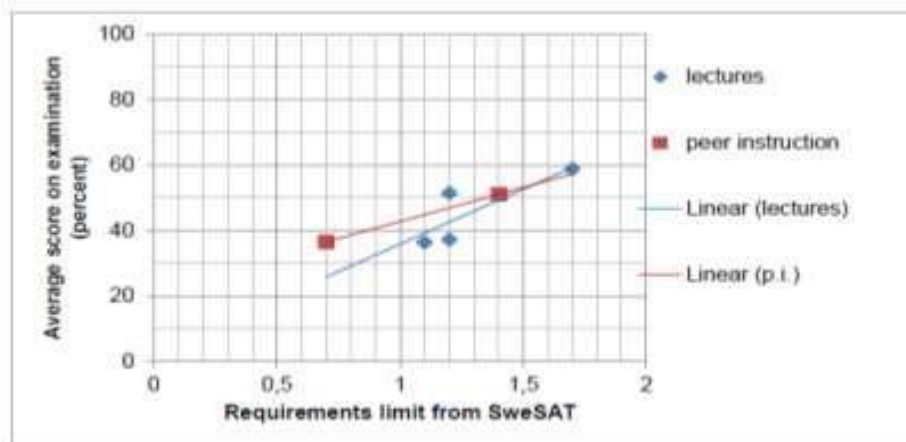


[Figure 2.] Average test scores compared to average high school and entrance scores.

University applicants are admitted through an assessment test. Each course has a certain score limit. Scores are expressed on a scale of 0-2, and depending on the score, the student passes or not. 6

Figure-3 shows the comparison of the average score of the course. Also, the curve of the PI group /red/ is higher than that of the normal group /blue/, indicating improved learning ability.

[Figure 3]. Comparison of average course test scores with IEP scores.



As can be seen from the above 3 comparisons, the index of pre-determination is more or the same in both of them, which shows that learning the subject by pre-determination method is more effective. A similar result was obtained when the survey was conducted as a percentage of students who passed the exam. In doing so, even students who did not take the exam were included.

Quality results

Preliminary analysis of open-ended questionnaires showed that students were more active and motivated in the PI method compared to the conventional lecture method. They personally participated in the lesson and were enthusiastic. The students mentioned that the discussion was very interesting and unforgettable, and said that they had to read the booklet carefully and prepare a lot when coming to the lecture. He also said that this method was a little challenging and a little difficult. The main problem students faced was that they had to read the book first. And what they are a little worried about is that they only understand the examples discussed in class, not the broader knowledge. Furthermore, some students also thought that mathematics is a good subject to review at home after the teacher first introduces the main principles and examples.

5. Conclusion

This was our first experiment using the PI method in a Mongolian history course at a university. Our main goal is to combine quantitative and qualitative indicators to clarify the nuances and provide a clearer picture of the use of predestination in history education. We saw both advantages and disadvantages. Looking at the results of the research, the student's learning ability has improved, but it is no less than the knowledge that can be obtained from regular lectures. We did not change the test behavior in our experiment.

Let's not forget the theoretical problem that written exams test students' problem-solving skills and theoretical knowledge, but do not focus on knowledge of the underlying concepts. It cannot be ruled out that a student can focus on basic knowledge with the help of a specialized alternative test. However, it is

difficult to express how big it is. Our findings are consistent with previous research, and the use of preconceptions can lead to effective teaching and learning methods that focus on providing basic knowledge to students. Some lessons were extended and students said that it was difficult to study in this way. Perhaps the reason for this is that a student studying by PI method is forced to familiarize himself with the materials from the first day of class. They cannot put off learning. Their high school education did not focus on or prepare them for this. Also, PI texts give a realistic idea of what level of knowledge is required to successfully complete the course.

As the course progresses, the lessons will become more difficult and require a higher level of knowledge, and they will have to put in a lot of effort to achieve it. Because the student has to approach the lesson step by step and wait for a long time until he understands the subject himself. We do not know how difficult it is for a student to understand a topic

But there are also relative advantages compared to the traditional lecture method. Knowing what students struggle with will allow you to tailor lectures and lessons to suit them. If students find it difficult to read the book beforehand, they can be given additional material to help them understand the topic.

It must have been difficult for both the teacher and the student to create a new role in that learning activity. Many students believe and express that the teacher should provide the students with appropriate knowledge. So, the new way of teaching and learning may seem a bit overwhelming and too intense for students who are used to teacher-centered learning. However, it may help the student to be more active in his/her learning activities, to accept the teacher as a helper rather than a lecturer, and to get used to it.

References

- [1] Biggs J. and Tang C., (2011), *Teaching for Quality Learning at University*, 4th edition, Open University Press, Maidenhead.
- [2] Entwistle N., (2009), *Teaching for Understanding at University: Deep Approaches and Distinctive Ways of Thinking*, Palgrave Macmillan, New York.
- [3] Brandell, G., Hemmi, K. and Thunberg, H., (2008) The widening gap – a Swedish perspective, *Mathematics Education Research Journal*, 20(2), pp. 38-56
- [4] Lithner, J., (2008) “A research framework for creative and imitative reasoning,” *Educational Studies in Mathematics*, (67), pp. 255-276
- [5] Engelbrecht, J. Bergsten, C. and Kågesten, O., (2009) “Undergraduate students’ preference for procedural to conceptual solutions to mathematical problems,” *International Journal of Mathematical Education in Science and Technology*, 40(7) , pp.927-940.
- [6] Halloun, I.A. and Hestenes, D., (1985), “The initial knowledge state of collage physics students,” *American Journal of Physics*, 53(11) ,pp. 1043-48.
- [7] Mazur E., (1997), *Peer instruction: a user’s manual*, Prentice Hall, Upper Saddle River, New Jersey
- [8] Deslauriers L., Schelew E. and Wieman C., (2011), “Improved learning in a large-enrollment physics class,” *Science* (332), pp. 862-864.
- [9] Gok T, (2012) “The impact of peer instruction on college students’ beliefs about physics and conceptual understanding of electricity and magnetism,” *International Journal of Science and Mathematics Education*, (10), ,pp.417-436
- [10] Pilzer, S., (2001), “Peer instruction in physics and mathematics,” *PRIMUS: Problems, Resources and Issues in Mathematics Undergraduate Studies*, 11(2), pp.185-192.
- [11] Lucas A., (2009), “Using peer instruction and i-clickers to enhance student participation in Calculus,” *PRIMUS: Problems, Resources and Issues in Mathematics Undergraduate Studies*, 19(3) pp. 219-231.

SSSED-03

Educational Games. Developing Engineering Mentalities Using Educational Applications

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Abstract: This article shares the experience of implementing STEM-based learning in the first year of undergraduate programs in Metallurgical Engineering, Electrical Engineering, and Civil Engineering. The STEM-based competitive competition "Engineering clusters" was implemented in the first quarter of the 2021-2022 school year. This article demonstrates the role and importance of STEM competitions at an important time of adaptation to university learning.

Key issues related to partial modeling of learning content are also identified. The results of the "Engineering Teams" competition showed the importance of students' independent learning skills and solving interdisciplinary problems. In addition, this competitive game demonstrated the practical importance of science in understanding engineering problems. Overall, the proposed learning model can serve as a foundation for changing the traditional way of teaching and learning for teachers and students.

Key words: STEM, Gamification, Introduction to Engineering, Engineering Thinking, Standards 3, 4, 7

1. Introduction

In a rapidly changing society, in order to make engineers capable of successfully solving and performing any professional problem and task, education itself must change and be updated in relation to the current challenges in society and technology and all engineering problems (Jeschke, 2016). The global CDIO Initiative offers a practice-oriented approach based on learning principles for modeling real-world engineering products [1]. The CDIO approach changes the traditional understanding of education and shifts it to active project-based learning.

One of the inevitable challenges in developing a CDIO-based curriculum is the challenge of changing and overcoming traditional, historically accepted concepts of teaching and learning and the common attitudes of teachers and students about education. Conflicts are most likely to arise when revisiting basic science courses such as history and philosophy. However, due to the complexity of engineering problems, knowledge of basic science disciplines alone is insufficient for modern engineers [2].

Therefore, in most cases, the traditional theoretical mode of basic science needs to be modified for modern engineering education. In order to improve the effectiveness of learning, the education system is moving from a passive approach to knowledge transfer through various learning activities to an active approach to acquiring knowledge through experience [3].

Competitive games are an active form of learning, based on the principle that students gain experience and knowledge by participating in specially designed games. Competitive games have a high learning value, which stems from participants' emotional learning efforts to achieve game goals and see conditions for success (Hamari et al., 2014). Gamification (simplification) or the application of game principles to non-game fields (Herger, 2014) has become a popular phenomenon in fields such as marketing, management, and education. The concept of STEM (Science, Technology, Engineering, Math) or "Science, Technology,

Engineering, Mathematics" is used to improve the quality of education in the field of basic sciences and to develop modern methodological mechanisms in these fields, as well as to create an engineering environment in the learning process. [4]

By combining the basic concepts of basic science and modern game methods, STEM technology connects theory and practice in the early stages of engineering programs. Despite the criticism of the gamification phenomenon (Fuchs et al., 2014), the implementation of STEM games in educational activities is very important. with engineering professional problems to be faced in the first years of school education will be an introductory stage [5].

The engineering context of STEM games highlights the need and importance of applying basic science knowledge to solving engineering problems. Due to the wide variety of application fields, the gamification phenomenon is mainly focused on the use of information technology. Due to the technological capabilities and the development of digital games, computer games, which have existed for decades, have become one of the most influential information industries today.

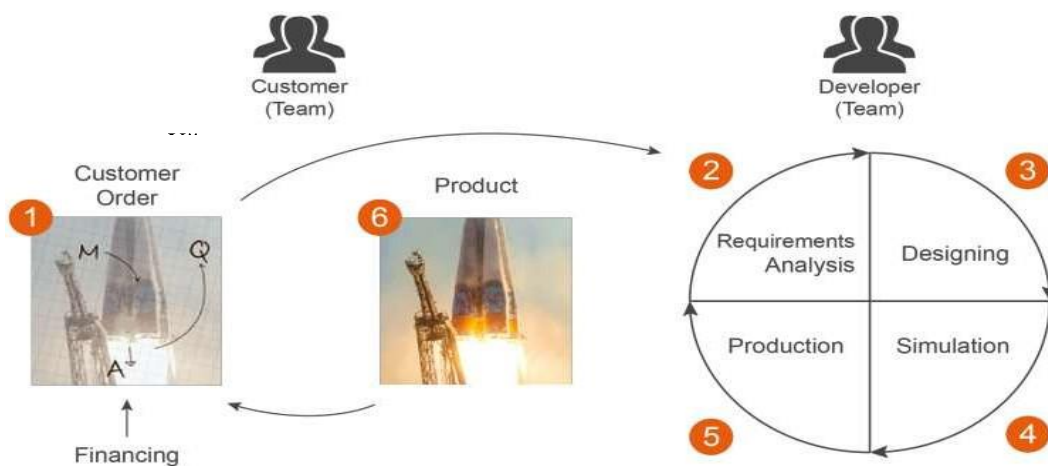
At a time when information technology, media and computer games are still an important part of youth culture, these tools can be introduced into the curriculum, and as a result, students' interest and desire to learn, as well as the quality of education, can be increased. This phenomenon is related to the special way of understanding and accessing information of today's youth, and numerous studies have explained it. In general, the digitization of content allows students to learn more comfortably using devices such as their cell phones and computers. Using gamification as part of foundational courses in the first year of an undergraduate program to digitize course content for young people can support student interest and change mindsets[5].

2. "Engineering Cluster" - concept of stem game

Educational game. With the aim of changing the learning process by developing engineering thinking using learning applications, "Erdenet Complex" Institute developed the "Engineering Teams" STEM game for 1st and 2nd year students. From an educational perspective, the Engineering Teams game uses first-year undergraduate level knowledge and provides students with engineering and social science concepts in a project-based manner. Students create knowledge in the game, Educational game. Engineers must compete with their brains using educational applications. The "Engineering Teams" STEM game is characterized by the following key features.

- ✓ User- friendly interface the game is developed as a website with a simple and modern graphic structure, where the main elements are provided with explanations (comments) and guidelines. There are also dedicated teaching assistants. Mobility and self-organization The website can be accessed anytime (24/7) using any digital device with an Internet connection, allowing students to plan flexibly.
- ✓ Real-life products All the products in the game are represented by real product calculation models and are compatible with the level of the first year of the Bachelor of Engineering program
- ✓ Learning content integration
- ✓ Each product in the game presents a specific problem in the basic science lessons Interdisciplinary approach
- ✓ High-level product development requires solving different problems from different disciplines simultaneously, so that students can clearly see the connections between social sciences within a single engineering problem.
- ✓ Quality improvement cycle

- ✓ The game uses Deming's PDCA cycle, which is an iterative process of planning–designing–simulating–production for each product.
- ✓ Teamwork The key to successful gameplay is to have a stable team with effective role management.
- ✓ Responsibility Teams need to keep their game budgets stable and make important decisions at every stage, from defining product requirements to collaboration
- ✓ Before completing the task, students must study the theory of these problems using their own knowledge. Unlike traditional training, students study theory while facing real practical problems during product design. Therefore, students clearly see and understand the connection between basic social sciences and engineering Figure 2 shows the life cycle of a toy product (for more details See Appendix A).

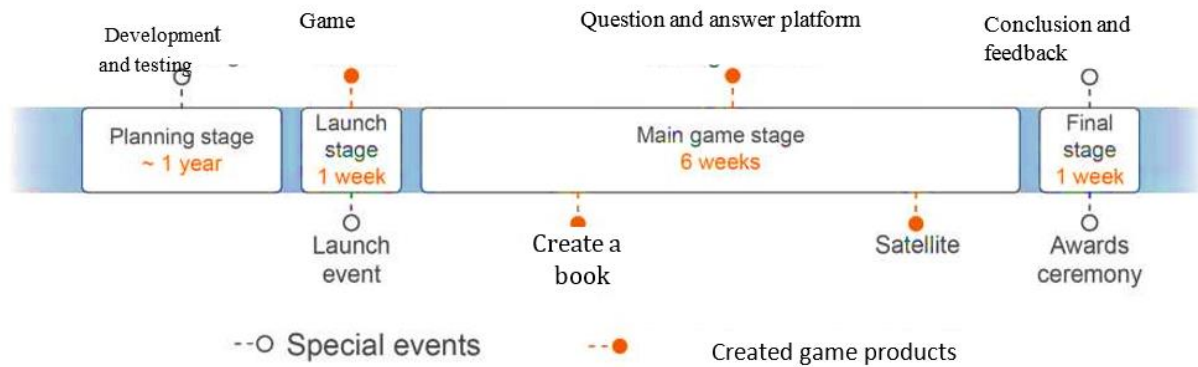


[Figure 1]. The toy product life cycle

3. Integrating Stem games into the curriculum: collaborative experience

The Engineering Teams game offers first-year students a unique opportunity to create a hands-on experience in an engineering context. However, integrating this game into the curriculum requires careful planning. In this chapter, we will share the operational experience of the "Erdenet Complex" Institute of introducing the "Engineering Teams" game to 3 CDIO-based bachelor's programs.

According to CDIO Standard 5, the "Engineering Teams" competition was organized as a module of the Introductory Engineering course taught in the 1st semester. The modular training workload is packed into 8 weeks, including classroom training, special events and independent study time.



[Figure2] Timeline of the "Engineering Teams" competition

From staff training workshops and curriculum development to performance evaluation and award ceremonies, the module structure was developed in advance over a 1-year period of activity. "Engineering Teams" STEM competition is divided into 3 sub-processes from the point of view of educational activities.

1. Competition process

- ✓ The total duration of the training module is 8 weeks, of which the last 7 days are dedicated to the competition conclusion, award ceremony and feedback activities.
- ✓ A core "Cluster session" is organized as part of the Introductory Engineering course (2 sessions per week).
- ✓ Additional "Cluster session" will be held at the request of students.
- ✓ Special "Troubleshooting sessions" every week
- ✓ The ratio of total classroom teaching time and independent study time is approximately 40% : 60%

2. Contest Support

- ✓ Classroom training will be supported by the teaching staff of the Introductory Engineering course.
- ✓ Training of social studies teachers
- ✓ Senior student support (tutor student) – advising and teaching on competition adaptation, strategy development and team building
- ✓ "Social Studies Lessons" at the request of students
- ✓ 24/7 technical support for website error reporting

3. Competition management to the organizers

- ✓ Monitoring of website activity
- ✓ Game process and activity based product ordering pool
- ✓ Regular meetings with teaching staff
- ✓ Assessment of learning outcomes
- ✓ Collect feedback

In the teaching staff

- ✓ Monitoring of team operations and team stability

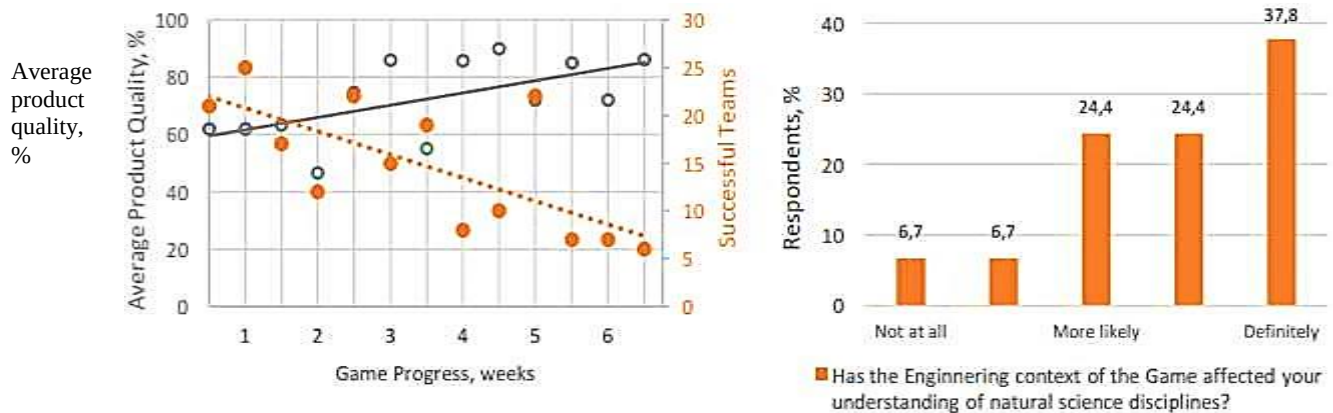
- ✓ Monitoring of competition rules violations and ethical issues
- ✓ Support less advanced teams
- ✓ Dispute resolution

4. Results and Discussion

The results of the "Engineering Teams" STEM competition implemented in CDIO-based undergraduate programs in the first semester of 2021 will provide students with a unique learning experience, in which all stakeholders of the educational activity are personally involved. Comprehensive statistics collected from the competition platform showed a positive change in the number and quality of products created by students (Figure 3a).

This graph shows the quality of each product presented during the competition and the number of teams that successfully created the product. (Figure 3a). This graph shows the quality of each product presented during the competition and the number of teams that successfully created the product. The increase in the average quality of the product is explained by the ability of students to quickly adapt to the competition mechanism and the learning requirements during the competition.

The difficult task of the competition resulted in a gradual decrease in the number of successful players. However, it appears that this form of learning has created a strong and stable team of students 6 who are able to overcome challenges. The results of the survey show that students have a positive attitude towards practice-oriented learning, and that solving engineering problems can stimulate students' interest in basic natural sciences. increased (Figure 3b).



(a) Evaluation of Student Team Results

(b) Student Research Results

[Figure 3] Competition statistics and survey results

Statistics of the "Engineering Teams" competition:

- ✓ A total of 120 students from 3 engineering programs formed 29 teams;
- ✓ 15 products were created from a total of 17 possible product models in the competition, with an average quality indicator of 67%;
- ✓ Out of 29 teams, there were 7 teams that were able to solve the maximum of 15 product designs;
- ✓ The total number of created products is more than 3000
- ✓ More than 50% of students spent 2-4 hours every day in "Engineering Teams";

- ✓ Workshops for trainers were more than 30 hours in total.
- ✓ Effectiveness of training:
- ✓ Students can create a high-level product if they successfully solve the problems of each component;
- ✓ The average time taken to create a high-level product gradually decreased (from 14 days for the first product, 10 days for the second product, and seven for the 3rd and 4th products). This shows that students have improved their ability to analyze complex products and solve interdisciplinary problems.
- ✓ Most students were successful in solving complex and challenging problems. (support materials and technical guidelines do not provide any instructions or algorithms);
- ✓ Students will be introduced to professional engineering problems and use the project approach to solve them;
- ✓ The competition created an unscheduled learning process, provided a unique teaching-learning experience for both teachers and students, and created long-lasting relationships between teachers and students.

The proposed approach to the implementation of STEM games (competitions) in educational activities allows to achieve important results due to careful planning and curriculum integration. Erdenet Complex's previous experience of STEM education was based on student choice and lacked support for activation systems and gamification. This first attempt produced negative results, with students neglecting the game and focusing on more important subjects.

However, the active support of the teachers made the "Engineering Teams" game the most important learning event for the students and increased the students' learning efforts and interest in the engineering profession. Judging by the results obtained by students, the possibility of implementing STEM games in the first year of education is defined as follows

1. The need to familiarize students with project activities at the earliest possible stage (Study Plan 2.1)
2. Positive attitudes of students towards basic science (Curriculum 1.1)
3. Expertise-oriented game problems require the integrated application of knowledge, techniques and skills in the application of basic science. (Standard 3)
4. The form of education for modern students has made learning activities active out of the classroom
5. Use teamwork to solve game problems
6. Training on the impact of student responsibility on product quality
7. Support the engineering vision of students to see the product as a complex system with a life cycle (Curriculum 2.3)

5. Conclusion

The implementation of STEM technology for first-year undergraduate students of "Erdenet Complex" University showed the possibility of creating an engineering environment within the content of basic science. The "Engineering Teams" game format presents students with engineering professional problem presented and showed the need and importance of multifaceted knowledge in solving engineering problems. The integration of games into the curriculum, as well as the active support of teachers and staff, greatly increased the effectiveness of education. Overall, the goal of STEM games is to provide young students with a valuable and essential learning experience, to develop their engineering mindset and encourage them to actively pursue university studies.

References

- [1] Crawley, E.F., Malmqvist, J., Östlund, S., Brodeur, D.R. (2007). *Rethinking Engineering Education*. Springer US. ISBN 978-0-387-38290-6.
- [2] Fuchs, M., Fizek, S., Ruffino, P., Schrape, N., et al. (2014). *Rethinking Gamification*. meson-press. ISBN 978-3-95796-000-9.
- [3] Gonzalez, H.B., Kuenzi, J.J. (2012). Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer. CRS Report for Congress. Retrieved January 14, 2017 from Federation of American Scientists: <https://fas.org/sgp/crs/misc/R42642.pdf>
- [4] Hamari, J., Shernoff, D. J., Rowe, E., Coller. B., Asbell-Clarke, J., & Edwards, T. (2014). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*. 54: 133–134. doi:10.1016/j.chb.2015.07.045.
- [5] Herger, M. (2014). Gamification Facts & Figures. Retrieved January 14, 2017, from EnterpriseGamification.com:
http://enterprise-gamification.com/mediawiki/index.php?title=Facts_%26_Figures
- [6] Jeschke, S. (2016). Engineering Education for Industry 4.0. Proceedings of 2016 European CDIOMeeting, Delft, Netherlands. Retrieved January 14, 2017, from 4TU:
https://www.4tu.nl/cee/en/events/cdio_conference/presentations/engineering-education-for-industry-4-0.pdf.
- [7] Kamp, A. (2016). *Engineering Education in a Rapidly Changing World*. 2nd Rev.Ed. TUDelft. ISBN: 978-94-6186-609-7.

SSED-04

Secondary School Students' Attitude Towards Mongolian Dance (bii biyelgee)

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Abstracts:

Mongolians have been adapting to a settled civilization from a nomadic civilization that they have lived in for centuries, becoming a socialist society and then a democratic country. One example of this is the problem of art education, which is a part of the reforms being carried out in the field of education in Mongolia. In the 21st century, as a part of the process of globalization, modern public culture, cultural varieties, and many currents of art are coming to push traditional culture out of the people's current life, and the space for the existence and development of this art education problem is shrinking even more. Therefore, we are conducting a survey to find out whether secondary school students know about Mongolian bii biyelgee (Mongolian traditional dance), what their attitude is, and whether there are students who can create and implement it, and present the results. Students know Mongolian bii biyelgee, some students can do bii biyelgee and are proud of it. Mongolians also know the importance of creation. A total of 160 students answered that 80% of the students who participated in the survey said that they could not dance Mongolian bii biyelgee (Mongolian traditional dance), but 53.4% of the students answered that they wanted to learn to dance. It is right to study the development of foreign countries and the historical periods of art in art classes, but in order to develop children as Mongolians, it is more important to educate them from an early age to know and respect their own history, traditional heritage, culture and customs.

Key words: secondary school's students, intangible heritage, Mongolian traditional dance (bii biyelgee), attitude

1. Introduction

We, Mongolians have been living for many centuries from the nomadic civilization, won the people's revolution, and since then we have adapted to the settled civilization and developed into democratic country after socialist. One example of above is the problem of art education, which is a part of the reforms being carried out in the field of education in Mongolia.

In the 21st century, as part of the process that we call globalization, modern popular culture, cultural types, and many currents of art are coming in and pushing traditional culture out of the people's current life, and the space for it to exist and develop is shrinking more and more.

It is right, to study the development of foreign countries and the historical periods of art in art classes but what is more important to develop children as Mongolians is to instill in them the attitude of knowing and respecting their own history, traditional heritage, culture and customs from an early age.

However, the majority of students are interested in learning dances from other countries / such as hip-hop, k-pop, etc/. In this way, children and young people do not yet understand the importance of their traditional Mongolian heritage. Therefore, it is an important issue to carefully study secondary school students' interest in Mongolian bii biyelgee (traditional dance), studying it, and their attitude towards it. Considering the detailed study of the traditional methods of child upbringing, researcher T. Namjil wrote "Upbringing Traditions of Mongolian Family -1" which combines the theoretical and methodological basis, principles, goals and principles of studying Mongolian family rearing traditions and systems(Namjil.T, 2020), and "Philosophy of Nomadic Civilization of Mongolians" (Khavh.N, 2005), written about the philosophical content of nomadic life and civilization, and the development trends of nomadic civilization, "From the Mongolian tradition of the development of a citizen" (Davaa.J, Pedagogy, 2018) can be mentioned.

In addition, among the works of young researchers on the topic related to this research, the 2004 work of G. Enkh-Amgalan, Master of Ethnology, who carefully studied the traditional methods of family education, and Shini-Od. N and his colleagues, studied the impact of Korean culture on the Mongolian household within the framework of the Master's research work. For example, there is a lack of work that studies of students' interest in Mongolian dance /bii bielgee/, learning about it, and attitude toward it. But in foreign countries, for example, the researcher F. Buedron studied to clarify the knowledge and understanding of the folk dance of Philippine school students. The majority of his participants were students between the ages of 15 and 17, and as a result of modern innovations, many types of dances can be easily learned online. The popularity of hip-hop dance is growing rapidly, especially among young people. It is noted that this may pose a risk to the long-term existence of folk dance, one of the intangible cultural heritage of the country. On the basis of the " National United Values" which is one of the 9 main goals of the long-term development policy of Mongolia "Perspective Vision 2050", the simple but vital values of the Mongolian way of life should be preserved and passed on by modern people. It has been mentioned that in recent years, the fact that they do not know or ignore its value, importance and meaning has been clearly noticed. Therefore, there is a need to study students' heritage culture attitudes.

The purpose of this research work is to study the attitude of secondary school students towards Mongolian traditional dance /bii bielgee/. The survey was obtained using a questionnaire method. 160 secondary school students participated in the study. The results were processed using the SPSS software, which was collected by asking a question on the google forum among the students.

In Mongolia, art education is implemented through the "Art" core schedule. It is divided into visual arts and music lessons. Dance education is implemented within the framework of elementary and basic education in the content of the "Music" curriculum, which is one of the music curriculum. As for the curriculum, it has expanded from the details of dance art to music, dance types and classifications, Mongolian folk dances, and ballet. This course teaches theoretical knowledge.

In terms of content, only in the 7th grade there is some lessons of Bii biyelgee /Mongolian tradition dance/ in the traditional Mongolian art types. In the General Secondary Education curriculum, recognizing one's own heritage and supporting the comprehensive development of the body through creation, which is a type of intangible heritage, can be a way to pass on the traditional Mongolian art to children by combining teaching methods with age-psychological characteristics.

2. Literature review

In the article "Educating children about traditional heritage through national dance", a study conducted in Taiwan found that indigenous students are ashamed of their heritage, have low self-esteem, and have a negative attitude towards life. It was intended to examine how art influenced the development of their national identity. In this study, 14 students from indigenous families were enrolled in the dance club for 2 years on their own volition. Once a week after school, the members learned their ethnic dances and songs. The experience of students getting to know and interacting with their peers and learning about the traditional culture of other tribes helped them to accept themselves and understand their ethnic identity. As a result of the study, through international matches, they learned about self-confidence and also recognized other national differences. During the study, they were proud of their national customs, their self-confidence increased, they felt that they were helping to preserve their culture, and some of them made a commitment to pass on their culture to future generations [1]. In the article "Transmitting national cultural traditions through folk dance" in Sakha, national dance is defined as a part of culture, related to people's traditions, worldview, and lifestyle

Children participate in performances, festivals and competitions outside of school, but the history of the Sakha people, their unique culture, the distinctive features of Yakut folk dances, how they have adapted to live in harsh environmental conditions, and modern globalization have led to the loss of invaluable cultural elements. At a young age, it was considered necessary to find a way to preserve and pass on traditional culture.

Dance art is a part of national cultural education. Sakha dance culture reflects the essence of people's lifestyle. Therefore, it was mentioned that a project was made to establish a new folk dance ensemble. The research used general scientific methods, synthesis and modeling methods to analyze the theory of national culture. From these studies, it can be seen that dance is a possible way to teach children about their national identity, culture and life [2].

Attitudes are defined differently by researchers. For example, an attitude is a person's liking or disliking of something or someone that can be evaluated [3]. An attitude is a judgment made about an "attitude object" (person, place, task, event, skill, etc.) [4]. Attitudes arise from a person's own conclusions, thoughts, and inherited basic values. It is also influenced by the person's emotions in the given situation. So, it can also be said that "attitude is a person's opinion and mood, how he evaluates and reacts to others, things and events." Attitude includes 3 main components: affective (emotional), behavioral and cognitive [5].

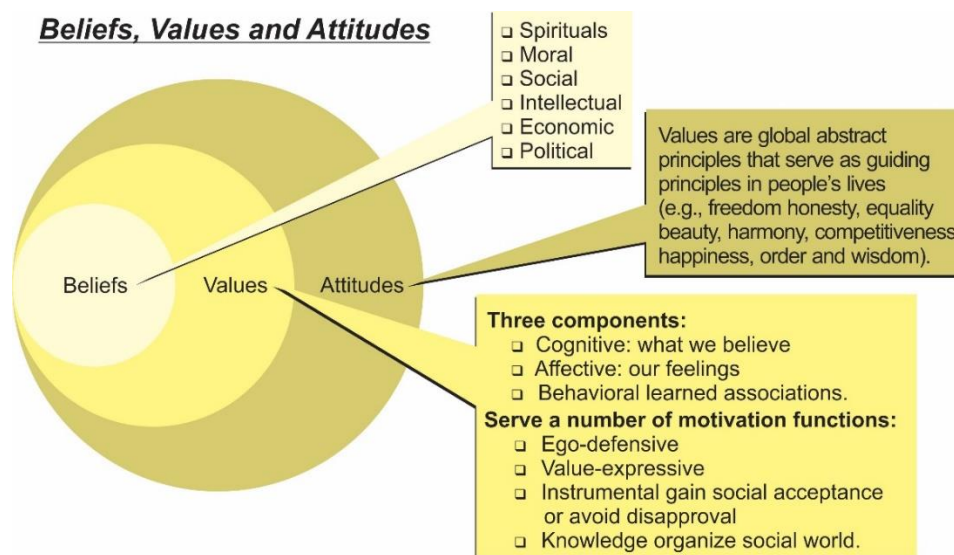
1. Affective (Affective) component: It includes human feelings/emotions about the object in question.
2. Behavioral component: This is the part that affects our behavior and performance.
3. Cognitive (Cognitive) component: It includes a person's belief / knowledge about the object of the attitude. This is called the ABC model of attitude.

In recent years, in addition to knowledge and skills, positive attitudes have been considered as an important component of students' competence. What a person's attitude will be depending first of all on the values inherited by that person. If the attitude is based on moral values, the person will often have a positive attitude. Because moral values are the valuable ideas of a good human life, and they always point to the positive side when making decisions in all areas of personal and social life. There is no concept of wrong or bad in value. Attitudes differ from values in that they are a person's own beliefs about something, an event, or a person. A belief is an opinion that a person believes to be true and correct. Beliefs are formed from personal

experiences and what other people say, such as teachers and parents. But a person's beliefs are not always correct. Therefore, we need to reflect and judge the opinions that form our attitudes. A person's beliefs, attitudes, and conscience exist in the inner world of a person, and the behavior based on them is exposed, as can be seen in the following images based on McClelland's model of the competence iceberg.

Attitudes arise from our internalized values and beliefs. Beliefs are assumptions or beliefs that we hold to be true based on past experience. A value is a valuable idea based on things, concepts, or people. Behavior refers to how these internal systems (attitudes, beliefs, values) are expressed. These factors greatly affect the ability to learn and organize knowledge and skills. In order to influence performance in a learning environment or organization (or even at home), it is important to be aware of the key differences between these structures.

[Figure 1] Beliefs, Values and Attitudes



In modern times, when determining the goals of the educational process, efforts are being made to take into account the needs of students and increase their participation. The content of the educational process is a system of knowledge, skills, and practices that students should acquire, as well as morals, behaviors, worldviews, and attitudes. Thus, the content should comprehensively reflect aspects of human development, maturity, and education.

The people of Mongolia have a national artistic heritage related to their traditional civilization, their occupations and customs. When reflecting the environment and reality in art, Mongolians cultivated their minds and developed their own worldview and aesthetic expression [6].

Cultural researcher B. Sumya said, "Mongolia's characteristic nomadic culture preserves its roots and forms the foundation and backbone of national culture [7]. However, in UNESCO's World Report on national heritage, "in order to preserve the form of self-expression of a culture that is struggling to survive because its culture cannot be equal in the face of globalization" and it is mentioned that efforts should be made[8].

However, Article 1.1.6 of Mongolia's national security concept states that "preserving and developing the national history, language, culture, heritage, and customs are the foundation of the Mongolian nation's survival and vital immunity." Also, in section 3.1.1 of the basic education curriculum, "Each student should

acquire life skills, basic knowledge of science and learning methods, and the ability to learn independently and creatively, develop their national language, history, and culture with dignity, and develop into democratic and humanistic citizens." has defined its purpose. These documents highlight the importance of further securing national heritage and national immunity.

The Law on the Protection of Cultural Heritage of Mongolia stipulates that "arrangements for imparting knowledge about cultural heritage, its protection, and promoting methods shall be implemented through family culture, upbringing traditions, and the education system." It is important to organize cultural heritage education and to incorporate knowledge of cultural heritage and its protection into the educational standards of preschool and general education schools.

The *bii biyelgee* /traditional dance/ is an important heritage of the Mongolian national culture, and it is an expression of the happiness, life, struggle, and customs of the Mongolian people. A rare and unique type of national traditional dance that has been passed down from generation to generation, the tradition of the performance has been inherited among the Western Mongolians or Oirad tribes and has reached the present day. Researchers have noted that this wonderful art was created only by nomads and has never been replicated by anyone, so it has become a type of folk art. Since *bii biyelgee* /Mongolian traditional dance/ was danced at home, among people sitting around, in places with little space, chest and hand movements have been carefully developed, and it shows Mongolian people's activities, rituals, patterns, and life content with real human emotions and artistry.

The unified forms of *Ikél* bowing and *bii biyelgee* /Mongolian traditional dance/ are home theatrical performances and is a wonderful heritage of Mongolian culture and art. It is hard to imagine any celebration or festival without *Ikél*, which is the unique pride of folk art created by Mongolians. Choreographer M. Muiyungtsetse believed that creation of *bii biyelgee* /Mongolian traditional dance/ can be divided into 4 parts of character representation. It includes:

1. It is characterized by the expression of natural phenomena. Natural formations, mountains, rocks, sacred mounds, water flows, heaven and earth are related to each other.
2. Connects with game animals and livestock. For example, there are many *bii biyelgee* /Mongolian traditional dance/ and dances related to bears, deer, wildebeests, camels, and five-headed animals.
3. Related to the lifestyle of nomadic Mongols.
4. Related to fairy tales, myths, and religious concepts.

These are the differences between Mongolian dance and others. On the one hand, it is strange and on the other hand, it is very unique [9]. *Bii biyelgee* /Mongolian traditional dance/ is passed down by encompassing the history, traditions, customs, music, legends, epics, costumes, and games of many ethnic groups in a broad sense. It is a dance art that expresses the characteristics of tradition and thought through body movements. *Bielgee* was danced at home, among people sitting around, in places with little space, so the movement of the chest and hands has been carefully developed, and it shows the actions, rituals, patterns and life content of Mongolian people with real human emotions and eloquence.

Teacher MUGJ /Honored actor of Mongolia/ D. Nanjid, the founder of the Mongolian dance choreograph course, said that performing *Bii biyelgee* makes one's soul sing while the body moves. The older *bii biyelgee* dancer H.Baaya "Bii biyelgee is valuable because it conveys the way of life, people's behavior, actions, customs and symbols in the same way. In *Bii biyelgee* /Mongolian traditional dance/ "It can be included in daily human activities such as milking and beating wool. *Bii biyelgee* (Mongolian traditional dance) involves constant movement, which is beneficial for health," he said [10].

A survey was conducted to clarify the knowledge and ability to perform bii biyelgee (Mongolian traditional dance) among students in modern times. It should not be overlooked that a certain number of students in the study are able to do bii biyelgee and are proud of it. 35% of 6th grade students, 25% of students, 17.5% of 8th grade students, and 12.5% of 9th grade students answered that Mongolian dance (bii biyelgee) is our traditional heritage. All students do not have the same knowledge.

[Table 1] Mongolian dance (bii biyelgee) is our traditional heritage

			Yes	No	Total
Grade	6 th grade	number	14	26	40
		%	35.0%	65.0%	100.0%
	7 th grade	number	10	30	40
		%	25.0%	75.0%	100.0%
	8 th grade	number	8	32	40
		%	17.5%	82.5%	100.0%
	9 th grade	number	5	35	40
		%	12.5%	87.5%	100.0%

[Table 2] Mongolian dance (bii biyelgee) performance compared to students' classes

			Yes	No	Total
Grade	6 th grade	Number	15	25	40
		%	37.5%	62.5%	100.0%
	7 th grade	Number	32	8	40
		%	80.0%	20.0%	100.0%
	8 th grade	Number	18	19	37
		%	48.7%	51.3%	100.0%
	9 th grade	Number	16	23	39
		%	41.1%	58.9%	100.0%

37.5% of the 6th grade, 80% of the 7th grade, 48.7% of the 8th grade, and 41.1% of the 9th grade answered that they can perform bii biyelgee, which shows that there shows a high correlation with the inclusion of Mongolian dance (bii biyelgee) in the music curriculum.

[Table 3] Comparison of the students' response to "I feel proud of being able to do Mongolian dance (bii biyelgee)" among the students' classes

			Don't know	yes	no	total
Grade	6 th grade	Number	25	6	9	40
		%	62.5%	15.0%	22.5%	100.0%
	7 th grade	Number	22	14	4	40
		%	55.0%	35.0%	10.0%	100.0%
	8 th grade	Number	28	5	7	40
		%	70.0%	12.5%	17.5%	100.0%
	9 th grade	Number	10	8	2	40
		%	25.0%	20.0%	55.0%	100.0%

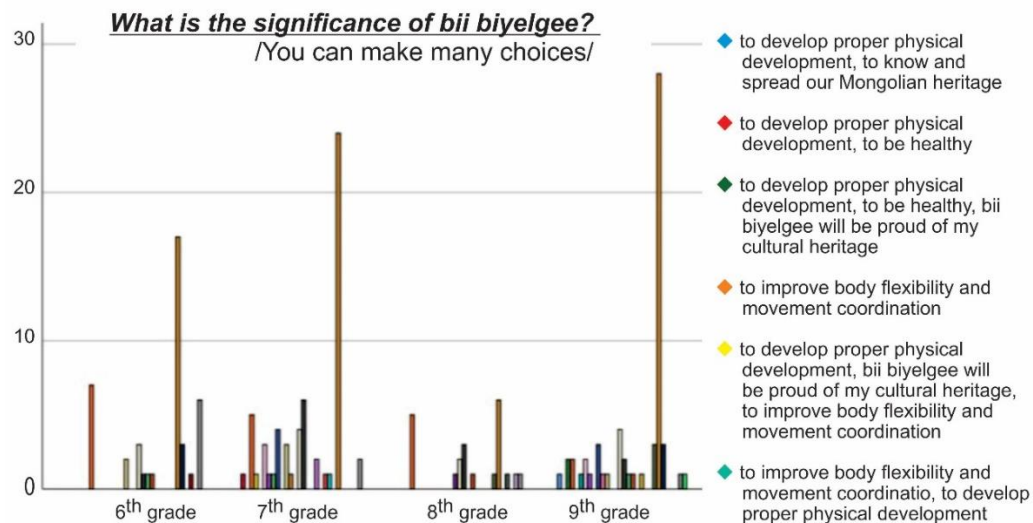
15% of the 6th grade, 35% of the 7th grade, 12.5% of the 8th grade, and 20% of the 9th grade answered that they feel proud.

[Table 4] Do you want to learn how to dance bii biyelgee?

6th grade 21.4%, 7th grade 70%, 8th grade 54.5%, and 9th grade 67.8% answered that they want to learn to exercise, and the average is 53.4%.

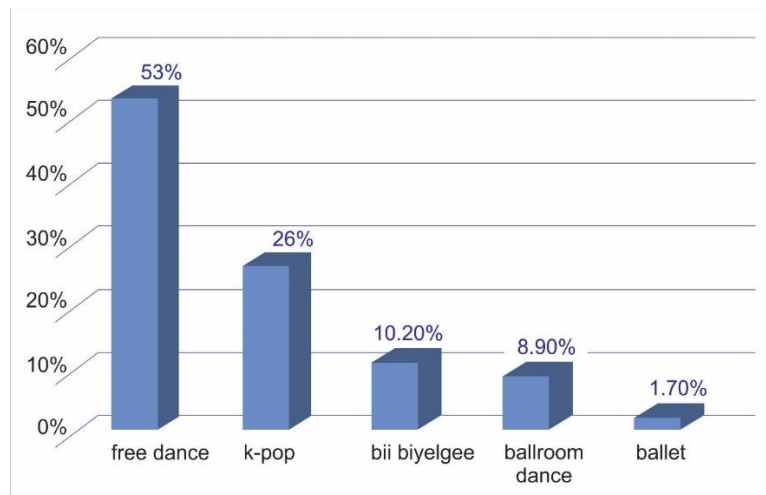
			Yes	no	Total
Grade	6th grade	Number	9	33	42
		%	21.4%	78.6%	100.0%
	7th grade	Number	42	18	60
		%	70.0%	30.0%	100.0%
	8th grade	Number	12	10	22
		%	54.5%	45.5%	100.0%
	9th grade	Number	40	19	59
		%	67.8%	32.2%	100.0%

When asked what is the significance of bii biyelgee, 42% answered that it improves body flexibility and coordination of movement, and 39.1% said that they know their Mongolian heritage.



[Figure 2] What is the significance of bii biyelgee?

53.2% of the students answered to the question that they like free dance, 26% like k-pop dance, and 10.2% like bii biyelgee.



[Figure 3] "What kind of dance do you practice?"

Conclusion and suggestion

Students know Mongolian bii biyelgee, some students can do bii biyelgee and they are proud of it. They also know the importance of Mongolian bii biyelgee. However, 80% of the students who participated in the survey answered that they cannot dance Mongolian bii biyelgee, but 53.4% of the students answered that they want to learn how to do bii biyelgee. This shows that there is an interest in learning. When asked what type of dance they are interested in learning, most of the students are interested in free dance.

In the schedule of training, including the task of systematically imparting knowledge, skills and attitudes about bii biyelgee, a traditional Mongolian dance, in the curriculum of music lesson, along with modern dance is important for the implementation of the provision "organizing cultural heritage education and incorporating knowledge of cultural heritage and its protection into the teaching standards of preschool and general education schools"

References

- [1] Chen, S.-M., & Lee, Y. A. (2015). Dancing with Ethnic Identities: How a Taiwan Aboriginal Dance Club Influenced Junior High Students. *International Journal of Multicultural Education*, 17(2), 20–34. <https://doi.org/10.18251/ijme.v17i2.926>
- [2] Chen, S.-M., & Lee, Y. A. (2015). Dancing with Ethnic Identities: How a Taiwan Aboriginal Dance Club Influenced Junior High Students. *International Journal of Multicultural Education*, 17(2), 20–34. <https://doi.org/10.18251/ijme.v17i2.926>
- [3] Paul H. P. Hanel, Colin Foad and Gregory R. Maio. 2021. <https://oxfordre.com/psychology/view/10.1093/acrefore/9780190236557.001.0001/acrefore-9780190236557-e-248>
- [4] Mohan Kumar. 2018. The Relationship Between Beliefs, Values, Attitudes and Behaviours. <https://owlcation.com/social-sciences/Teaching-and-Assessing-Attitudes>
- [5] Saul McLeod. 2018. Attitudes and Behavior. <https://www.simplypsychology.org/attitudes.html>
- [6] Delgermaa.B. (2022), Philosophy of Art. Ulaanbaatar, Heritage Culture.
- [7] Sumya.B. (1998), Does Mongolian nomadic culture exist or not? Ulaanbaatar.
- [8] Unesco.(2009), Supporting communication between cultural diversity and intercultural, Luxembourg
- [9] Munguntsetseg. M. (2023), Extraction of nomenclature of Mongolian traditional dance movements from Kings' pictures and seal signs

HSL-05

A Study of the Concept of “Fate” in English-Mongolian Texts (On examples of language facts based on the meaning of English and Mongolian literature)

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Abstract: The key term in modern cognitive science is a complex concept. A complex concept (Lat. Conceptus - concept or lat. Conceptio - concept, system) is based on the basic concept of the main lines and ideas that explain the content, its meaning and something, a specific way of understanding a phenomenon or process in terms of the system. In this regard, it can be compared to the language dictionary and the encyclopedia. Although we can make based on encyclopedias, such dictionaries do not provide a full framework of the meaning. This is because in a complex concept has also subjective knowledge and information related to the individual in addition to the knowledge of the language community. The study of complex linguistic concepts uses a variety of tools to identify and define the position, nature, and content in the complex linguistic concepts. To break down the concept in the traditional sense, a total of 3 main sources are used:

- Explanations and information from lexical sources aimed at discovering the general and more stable parts of the complex concept,
- Study examples of complex concepts within the text,
- Experimental results that can reveal new properties of a complex concept that is active in the mind, as well as expand and clarify its content.

In this study, we studied the explanatory information and complex concepts of the dictionary source of the word “destiny” in the context of the text, discovered the cultural composition in English and Mongolian languages, and made a cognitive explanation on the language documents in the research database.

Key words: *Cognitive, Conscience, Culture*

1. Introduction

Researched topic: In modern linguistics, one of the issues that has attracted a lot of attention and interest in the creation, research, and analysis of foreign scientists is the study of concepts. According to researchers, the problem of complex understanding is considered in linguistics as follows.

It was developed by Polish scientist A. Wierzbicka and Russian scientist S.G. Vorkachev from the perspective of language and culture.

The purpose of the research: We aim to analyze and interpret the complex concept of "fate" through Mongolian and English documents.

1. To discover the content of the complex concept of "Fate" based on the description of the two languages included in the study and encyclopedia documents by forming language documents
2. Based on the application of research to determine the structure of the concept of "fate", discovering the culture of the people in English and Mongolian.

3. Annotate the identity of the language documents in the research database

Research materials: When conducting research, we have created a research base based on sources such as Mongolian and English dictionaries, encyclopedias and other types of dictionary information, and texts taken from literary books.

Theoretical and practical importance: We have carried out our research in the field of cognition, which is an interdisciplinary field of science. When any new field of science emerges, new knowledge and terms will inevitably arise around it, and an attempt to decipher and explain language phenomena from the perspective of cognitive linguistics is Mongolian language. Analysis, it is considered important in the parallel linguistics of Mongolian and English languages. Also, the importance of this work says in enriching the general theory of identity linguistics with facts of Mongolian and English languages.

Research method: within the framework of the general method of comparing the documents of two different languages, the identification interpretation method, the compositional method, and the semantic analysis method were used.

Cognitive science is:

- An interdisciplinary science combining identity theory, identity psychology, neuroscience, philosophy, anthropology, and artificial intelligence theory
- In order to develop the theory of human brain activity, computer models from the field of artificial intelligence and experimental methods from psychology and neurophysiology are used together.

When people know something, they rely on existing knowledge, not from nothing.

2. Main part

Complex concept as the basic linguistic unit of identity - A key term in modern cognitive science is complex concept. Let's get acquainted with the definitions of scientists who have used the term in a wide sense in many fields of science and are closer to our research work.

Comprehensive concept (lat. Conceptus - concept or concept - lat. Conceptio - concept, system) is a concept separated from the specific form of the language of its expression, content, its meaning and a certain way of understanding a thing, phenomenon, process, and an approach to the thing. It is believed that concepts are based on the basic concept of main lines and ideas to explain them from the point of view of the system.

In this regard, language dictionaries and encyclopedias can be compared. Although we can rely on encyclopedias, such dictionaries cannot provide the full range of comprehensive concepts. Because in the comprehensive understanding, there is also subjective knowledge and information related to the individual in addition to the knowledge of the language community.

What is comprehensive understanding?

- Language is a cognitive phenomenon. Kubryakova, 1996
- Psycholinguistic phenomena. Zalevskaya, 2001
- Abstract concepts of science. Solomonik, 1995
- The basic unit of culture. Stepanov, 1995
- Language and culture phenomena. Slyshkin 2000, Karasik 2001

In traditional linguistics, word meanings are divided into linguistic and non-linguistic. Non-linguistic knowledge refers to, for example, research on the meaning of a certain word, information in an encyclopedia, and the understanding of the individual narrator through his or her understanding of other phenomena. Another form of non-linguistic knowledge is related to the unique characteristics of each perceiver, i.e., the image and image system developed by his life experience.

The information about the things and phenomena of the world resulting from life experience is not messy in the human protein brain, but it is stored in the form of various schematic formulas as named in cognitive psycholinguistics and artificial intelligence research. Linguists define this as an identity frame. Field of knowledge refers to a set of information about specific things and phenomena that have emerged from human life experience. That country can be understood by summarizing a specific network or table of proteins stored in the brain about any concept.

3. Survey research

3.1. Comparative study of the complex concept of Fate".

Although sometimes used interchangeably, "fate" and "destiny" differ slightly in meaning and connotation. "Fate" is a force or institution that has the power to predetermine the chain of events that will happen in the future. Fate events are pre-ordained, inevitable, and unavoidable. It is a concept derived from the belief that the world and space have their own unchangeable nature.

Classical and European mythology even features a special figure known as the "turner of fate," the Moirai in Greek mythology, Perseus in Roman mythology, and Norn in Norse mythology. The events happening in the world are determined by the strength and rotation of the mysterious phone, and each phone represents the fate of someone. "Fate" is understood to be divinely inspired.

It is understood that the decisions and actions taken by individuals in the past were pre-planned and inevitable steps leading to the creation of this situation today.

Destiny is understood as "destination" or a place to be reached, the result of events that must happen, and the flow of events that must happen in the future. Fatalism refers to the belief that events cannot be changed by any human action or decision, that is, one cannot change one's own fate or the fate of anyone else.

In everyday speech, fate and fate are considered synonymous, but in the context of 19th century philosophy and thought, these words began to have completely different meanings.

For Arthur Schopenhauer, Destiny is the expression of a person's determination to live, and the choice to choose one's fate through the power of Art and Morality, despite living with the right of fate.

For Friedrich Nietzsche, Destiny is in the form of Amor fate or loving one's fate, and the important element of Nietzsche's theory, which is the "strength" of human behavior, was influenced by Schopenhauer's "Life Force" theory. This theory can have other meanings, and in some parts, he believed that "will to power" is a powerful element of survival and adaptation. Although Nietzsche repeatedly uses the phrase amore fate in the sense of choosing and accepting fate, it is understood as a "choosable" fate.

The meaning and origin of the religion of Fate:

In Christianity, your fate and life are predestined by God. You cannot change the destiny that God has prepared for you, and you trust God for your future. This content is closely related to the concept of destiny in Western culture and is especially evident in Christianity. In the Bible:

"I know the plan I have prepared for you," said God. Revival Life Plan and It Won't Hurt You. A plan to give you hope and a future" (Jeremiah 29:11)

In the Babylonian religion, Nabu, the god of writing, was said to have left the destiny of mankind to the gods of the Assyrian-Babylonian temple through the deities of the Anunnaki.

Followers of ancient Greek religion worshiped not only Moira, but also the god Zeus, who was believed to be responsible for deciding fate and fulfilling destiny.

Christians believe that God is the only force that directs one's destiny and that He has a plan for everyone. Many people say that everyone has the right to make decisions, but it goes against their predestined destiny and their natural instinct to live according to God's will.

In Islam, fate and destiny are orders from God.

In Buddhism, all phenomena (thoughts or otherwise) arise out of prior phenomena according to the laws of the universe, expressed in the theory of paṭiccasamuppāda. A central teaching of Buddhism that directly informs its other branch theories is the notion that everything is impermanent.

3.2. Information content of the comprehensive concept "Fate".

(Comparative lexical analysis and identification description)

We analyzed the description of information content in the following 4 stages.

1. Etymological breakdown of the word appearing in the meaning of the given word/complex concept:
2. Dictionary description of key words defining the meaning of the complex concept
3. The syntagmatic/co-textual meaning/ aspect of the combination of key words related to other word families that provide a complete definition of the complex concept.
4. The meaning/paradigmatic/ aspect of identifying or naming the same meaning that expands the content of the complex concept

Based on the above methodology, we aim to open the field of content based on the dictionary application of the complex concept of "PERSONALITY". First of all, let's consider the etymological explanation of the word.

Etymological explanation

-Mythological origins: the Fates

-Original word/Latin Root: Fatum 'that which has been spoken', fari 'to speak'.

◇ fate, by its root, necessitates preordination. In culture and literature that preordination is challenged or upheld.

fate (from Latin fatum "decree, prediction, destiny, fate"), is a predetermined course of events.[1][2] It "Fatum" of Latin origin is derived from the root "fari" or "to say, to speak". Hence: Fate, according to the national meaning of its word, signifies Predestined.

Fate (Latin fatum "command, foretelling, destiny, destiny") means a certain unchangeable and predetermined future, whether general or individual.

Dictionary description of key words defining the meaning of the complex concept Table 1

Хувь заяа	FATE
PERSONAL IY name. A person's luck, encounter, blessing, destiny. (a. the encounter of all ages of a person from birth to death, from growth to maturity,	1.Fate .What happens to a particular person or thing, especially something final or negative, such as death or defeat: We want to decide our own fate. His fate is now in the hands of the jury. /Одоо түүний хувь заяа тангарагтны гарт байна/ 2. [U]a power that some people believe causes and controls all events, so that you cannot change or control the way things will happen: <i>When we met again by chance in Cairo, I felt it must be fate.</i>

Personal name. Fate, coincidence, blessing: destiny, destiny, destiny (hospital. A picture of a person's life from birth to death, from growth to maturity)	- Fate-inevitable destiny or necessity, appointed a lot, destined term of life, three goddess of life who determine birth, life and a death -Fate-the share of king, tax, impost /Sanskrit-English dictionary/
Destiny 1. Human fate, encounter, and blessing: fate [cooperative] (a. The encounter of all ages from birth to death, from growth to death - These two people who grew up with the same fate, seem to understand each other, have a warm and beautiful It seems that the origin of the relationship was laid. S. Udal. Great destiny; b. [translated] The result of the development of something), fate [cooperative] (of human life I can't think of how I met such a person, what fate caused me to become an orphan so early. L. Dashnyam. Flower of God.	Longman Dictionary of Contemporary English 1. [countable usually singular] the things that happen to someone or something, especially unpleasant things that end their existence or end a particular period I wouldn't wish such a fate on my worst enemy. /Би хамгийн муу дайсандаа ийм хувь заяаг хүсээгүй/ Fate of No one knows what the fate of the hostages will be. ► see thesaurus at future 2 [uncountable] a power that is believed to control what Fate plays cruel tricks sometimes. A twist/quirk of fate (=something unexpected that happens)

In the two languages that are compared according to dictionary records, the co-word is fate
Dictionary of the Mongolian language: encounters of all ages, from birth to death, from growing up to dying, confusion of life, confusion of fate assigned to the individual

English glossary: 1. everything that happens in human life, death and defeat, especially unpleasant things

2. What happens in human life is explained as an unstoppable force.

3.3. Explanation of value

A idiom is a stable part of the vocabulary that is a comprehensive summary of the descriptive, thought patterns and cultural features of any language. Therefore, its unique language is rich in things that cannot be repeated in other cultures, such as old words, rare facts of the language, historical events, customs, traditions, and concepts related to religion.

"Fate" with idioms and phrases Table 2

Хувь заяа	fate
Combining their fates: getting married: And since that day, both Anu and Anu realized their sacred love and linked their fates. (B. Rinchen, Queen Anu)	a fate worse than death (often humorous) a terrible thing that could happen - o a fate worse than death - o (often humorous) a terrible thing that could happen - o At the last minute the hero saves her from a fate worse than death. - o At the last minute the hero saves her from a fate worse than death.
To wash your hands of your destiny: to destroy and waste your own life: He is the one who made a mistake by trying to bring others down because of his jealousy. He	(one's) fate is sealed /never change it/ A particular outcome for one is assured. Example: If the jury comes back with a guilty verdict, then his fate is sealed.

washed his hands of fate and now he has built his tree. (Saranvajjav, Sandalwood horse)	
Trust your fate - hope that fate will bless you to be offended by fate - to regret the lack of good fortune fate will be balanced - find a spouse and have children ... his wife, a tall brunette girl named Dulamkhand, lived alone for many years, and finally, her fate was evened out by the power of Zaan, a doctor with golden hands in the province. S. Purev "Stone door"	be a fate worse than death / something will happen in the future/ To be a very unpleasant situation or experience. This phrase is usually used hyperbolically, especially when referring to some form of punishment. . Example: <i>I appreciate Gina inviting me to go with her to the theater, but having to listen to those opera singers would be a fate worse than death.</i>

According to the facts we have observed, among the unique idioms of the Mongolian English language, in terms of meaning, most of them describe the Mongolian language as expressing the positive meanings of having a family and children, as well as destroying life, regretting, etc. It is possible to explain the above identity in the concept that expresses various qualities in human life.

Comparison of synonyms and equivalents in two language dictionaries Table 3

BLESSING II name - fate, destiny: blessing and fate (a life created with good in mind, destiny) encounter and blessing (encounters in life, fate) fate and blessing (a good fate to meet)	Destiny - the events that will necessarily happen to a particular person or thing in the future. "she was unable to control her own destiny" -the hidden power believed to control future events; fate. "he believed in destiny" Definitions from <u>Oxford Languages</u>
Chance noun- 1. Caused, happened, destined to meet: happy encounter (good luck) lucky encounter (good thing that happened by chance) accidental encounter (sudden occurrence, unexpected event), 2. Fate: encounter blessed association (in life) fate to meet), fate to meet	Chance - 1.a possibility of something happening. "there is a chance of winning the raffle" 2. The occurrence of events in the absence of any obvious intention or cause. "he met his brother by chance "
Destiny, I name- 1. Fate, encounter, struggle: good fate (good fate), bad fate (bad fate)	Doom - death, destruction, or some other terrible fate. "the aircraft was sent crashing to its doom in the water" -condemn to certain death or destruction. "fuel was spilling out of the damaged wing and the aircraft was doomed"
OCCURRENCE name- 1. Name of the event, encounter: encounter, coincidence (meeting, fate, coincidence) coincidence (character, fate) coincidence	

Fate, name 1. endowment, confusion, destiny, destiny, score, story, picture illusion, destiny, luck, fate blessing, fate story, fate fight (the dictionary) Destiny: take care of your destiny and step on your destiny.	Lot - one's way of life or worldly fate : FORTUNE <i>Your lot is the kind of life you have or the things that you have or experience.</i> <i>Sometimes you just have to accept your lot in life.</i>
LUCK I noun - luck, some good chance encounter, fate: to be unfortunate (fortunate to happen), to be unfortunate (to be unfortunate), to be unlucky (to be unfortunate, to be unlucky), to be fortunate (a. a planned event is successful, b. any it is good for a person to travel a long way without hindrance), bad luck, religion (the sky that increases the good and bad mood of a person), bad luck (joy at a chance encounter), good fortune (the good and joy of a chance), bad luck (rarely found fate, satisfying good luck), (lucky fate of one age, lucky fate)	Providence-an <u>influence</u> that is not human in origin and is thought to control people's lives: <i>(The word provide is a good clue to this word's meaning: when a religious being is said to give people providence, he's taking care of them — providing for them.)</i> <i>He always made sure his kids never got into trouble, was concerned about money, and trusted the providence of the Holy Father to do the rest.</i>

Mongolian words with the same or similar meaning express all the good things that happen in a person's life, such as a good event, an accidental encounter, an unexpected event, an event that brings joy, or a blessing to meet.

- in English: an event that will inevitably happen in the future, there is no possibility of avoiding the thing, and it indicates a positive meaning such as opportunity, while it also expresses a negative meaning such as fall, destruction, and death.

3.4. Explanation of proverbs

Let's take a look at the classification of the meaning of the proverbial flower related to the fate of peoples speaking in English and Mongolian.

A lucky person comes through rain [proverb] (the idea that a lucky person meets with good things).

Don't complain about fate, complain about yourself.

There is no flying from fate.

You often meet your fate on the road you take to avoid it

3.5. Socio-cultural field

Considering from the point of view of the pattern of national thinking and the mapping of the world of identity)

In this section, we aim to explain in detail several linguistic facts established in the thinking of the two peoples under study.

A world identity map is a world map created as a result of direct recognition of the environment and shows the current results of people's identity activities.

The map of the national identity of the world is the common and habitual repetitive units of the map of the world of each individual who is the representative of the nation. People's history, culture, world view or the basic concept of identity is different in each language. emotions and values.

“Fate” in the context Table 4

- I am happy not only because I became a minister of the people's government, but because I found the right path in friendship with an intelligent country. - This is a fate that is rarely found in a person, a fate that can be found as a result of hard work. - Do not become the king of kings, but sit as the king of truth It was he who made the choice of destiny - The settled civilizations of the East even called the invading nomads from the north the fate of the Assyrian sky [Respect]. - It's called the fate of barley growing on the tip of a needle. - It is a divine destiny to feel the thirst of the soul that cannot be quenched by external false impressions and superficial pleasures. That love is destined to become a king by aspiring to be a slave. -Fortunately, a spiral plant hangs from the edge of the shell to the bottom of the plant. - Do you and I have a special destiny that is different from those people? - The lives of mankind and the fate of the world are in the hands of a few politicians. - It seems that it is a rare fate to become a pot in the book. -Fate will reveal itself and threw the coin in the air. - Everyone eagerly awaited the fate. "No one can change fate..." Cowards who cannot control their own destiny seek the cause of their inferiority. - He said that he has a book that makes him happy. - It is fate that you meet a bodhisattva like my teacher afollow what he said.	I am sure that everything will be all right. The fate cannot laugh at me.” (Vogt & Hull, 2002, p.54) “You’re not trying to tell me that the ghost also tells the future. Why, today's only July - Your destiny cannot be changed. - Every man has his predestined fate. It is inexorable, and in your case the situation is that wishes will do you no good. You are doomed to die by hanging. - See what I’m getting at: No swindle, no murder, no destiny. No one, came the calm reply, can escape his destiny. - You are you, a definite pattern in the universe, with assigned role. You cannot be different. The Fates made you as you are. -“My destiny is fulfilled. ... and I, in the body of Pearsall, go on.” The red eye fixed on him unwinkingly. “Only one thing is wrong: Pearsall is not destined to hang.” -See what I’m getting at: No swindle, no murder, no destiny. No one, came the calm reply, can escape his destiny. (Vogt & Hull, 2002, p.138) -You are you, a definite pattern in the universe, with assigned role. You cannot be different. The Fates made you as you are. -If I were different I might develop some screwy religious notion about accepting my fate. I guess I can handle this best as myself. -Your destiny cannot be changed.

*If you have a chance, don't rush
If you have a steering wheel, don't pull it
/The idea that things that are destined to happen will happen naturally without having to rush or use force/*

*If there is luck, the general will sit
If you go along the road, you will enter Sandalwood
It means that by the right of fate, a person will achieve the intended need.
/Similarly, the words "I will sit far away if I have time" were written by the colleagues who remembered that great general Sukhbaatar often used to say when he was a letter carrier. Indeed, he sat as a general by the right of fate.
Fate is tricky
/Words that teach that destiny is unspeakably connected, which may or may not be fulfilled/
For the unlucky
Zaisan title cannot be found
It means that a person who is not honest and has a bad destiny will not get a title of hope of the government.
Fate is unlucky: it means that you are unlucky and have a bad fate
"The fate of being under the protection of such a good-hearted and intelligent person was very difficult.
"The best of people is that they are old." Heemeh's grief sat hard in his chest. Ts. Bazarragchaa "Sun of the School"*

*The meaning of bad luck
- It's also strange that the way of man is. In fairy tales, there is a woman who is destined to be born. It's like she's leading the way. Be careful... . Ts. Bazarragchaa "Sun of the School"*

Along with the meaning of destiny - the fate assigned to an individual, confusion, lucky encounter, the phrases such as the fate of the sky and the heavenly destiny are an example of how Mongolians symbolize their destiny as divine and bright. In the English language, what a person has discovered throughout his life, the path he has traveled, the incident that will happen in the person's life path, these are related to the situation, society, natural law, and the negative meaning of doom and destruction is the unfortunate end of people's life - the path that a person must take. is widely used in the meaning. (birth → life → death),

Conclusion

Based on the research materials of two languages, an attempt was made to discover the cultural formation of the complex concept of "FATE" in the English-Mongolian language. According to the facts, the complex concept of "PERSONAL FATE" has its own content structure in both languages. In addition to the common attitude of both peoples (a picture of a person's life from growing up to old age), it is also a document that expresses the unique characteristics of the attitude and thinking of the people. (Some meanings of the language dictionary, literary texts, and expressions related to customs).

By setting the goal of interpreting the identity of the documents in two languages in the research database, the methods of identity interpretation and the structure of the identity interpretation are determined, and the complex conceptual units resulting from them are composed of encyclopedic knowledge common to

mankind and the collective values accepted by the people, and these are the past of the people can be interpreted in relation to life experiences and history and culture of all periods.

It is obvious that we human beings think in complex concepts and not in words. It can be seen from the results of the above research that the human brain gets used to having a certain image or model of a phenomenon in its consciousness and interprets it through the units of the native language.

References

- [1] Ц.Балхаажав, Г.Лувсанцэрэн, С. Норовсамбуу, Ү. Нямдорж, Д. Содномгомбо. (1990), “Философийн толь”, УБ. -493х
- [2] Ж. Бат-Ирээдүй. (2006). “Монгол хэлний ойролцоо, эсрэг утгат үг, хэллэгийн толь бичиг”. УБ.Адмон
- [3] И.Дамбажав. (2010). “Оюун билгийн мэлмий нээгч аялгуу сайхан монгол үгийн дээж”. Монгол хэлний дэлгэрэнгүй тайлбар толь. УБ. -207х
- [4] Macmillan Publishers Limited, “MacMillan English dictionary”. (2002). p -209
- [5] Edited by R.F.Patterson.M.A., D.Litt. “Webster’s dictionary”. Oxford University Press (2004),
- [6] Сүлд-Эрдэнэ Г. Уянга Б. Нямаа Д. Баасанбат Д. Баярсайхан. (2011) “Монгол хэлний өвөрмөц хэлцийн толь”. Монсудар, -65х
- [7] Ч. Чимэгбаатар. (1996). “Монгол холбон бэлгэлсэн үгийн товч нэрийн зүйл”. УБ. -56-63х
- [8] Нарантуяа Ш. Монгол өвөрмөц хэлцийн тайлбар толь. -УБ.: Мөнхийн үсэг, 2017, -172х
- [9] Н.Нансалмаа, С. Долгор. (2014). “Танихуйн хэл шинжлэл”. Соёмбо принтинг ХХК, УБ. -50-55, 60-73
- [10] Н.Ням-Осор, Б.Өлзийсүрэн. (2011). “Монгол хэлний зүйр цэцэн үгийн товч тайлбар толь”. УБ. -175-177х
- [11] Oxford University press. “Oxford Advanced Learner’s Dictionary” (1989). p - 462
- [12]. China edition published by Pearson Education Asia Ltd. “Cambridge Advanced Learner’s Dictionary”. (2006). p-214
- [13] China edition published by Pearson Education Asia Ltd. “Cambridge International Dictionary of English”. (2001).p - 455 [14] Set in Whitney by Letter part, UK. “Advanced Learner’s dictionary of Current English”. (2010) P -125
- [15] Peter Wray. Longman Pocket Idioms Dictionary”. (2001). p – 48
- [16] Я. Цэвэл. (1966),” Монгол хэлний товч тайлбар толь”, УБ, -96х

HSTA-06

Research on tourism tendencies and MICE skills affecting MICE participation restrictions

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Abstract: In this study, MICE tourism propensity was shown to be adventure-oriented, and skills were derived as four sub-factors, and the relationship between MICE participation constraints was conducted as the main topic, and empirical analysis was conducted on MICE participants to identify the relationship between participants' MICE skills, MICE tourism tendencies and MICE participation constraints. Due to the very lack of awareness and conceptualization of the importance of MICE skills in MICE participation, and the scarcity of prior research, it is meaningful to fulfill the function and role of satisfying the need and justification for a more academic and theoretical approach to MICE skills in research in the field of MICE. In order to achieve the purpose of this study, empirical research was conducted on November 24 ~ November 28, 2022 for participants who participated in MICE based on the results of 248 offline questionnaires in a total of 260 copies. First, the overall results of the research hypothesis showed a good relationship between the measured variables, and the entire hypothesis presented was fully adopted. It was found that the tourism tendency of MICE participants had a significant effect on the skills of the participants. Second, MICE tourism has a negative effect on participation constraints, that is, the more adventurous the tourism propensity, the less participation constraints. Third, the higher the MICE skill, the lower the participation constraint, and finally, the skill showed a partial mediating role between MICE tourism propensity and participation constraint. Since this study was conducted on participants in domestic exhibitions, future studies will require more realistic research to improve academic completeness by verifying a research model that considers systematic differentiation between more diverse global MICE participants and consumers, and to present alternatives for the activation of international MICE economically.

Key words: MICE skill, MICE constraint, tourism tendencies

ITES-07

Some Results of Welding Technology Using HSLA Q550

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Abstract: This article investigates the welded joints of HSLA Q550 without preheating and post-heating treatment process. Tensile test, bending test, low temperature impact test, and the impact fractures and joint microstructure observation and analysis are used. The test result shows that the welded joints achieve equal strength with base metal. The average values of the welded joints impact absorbed energy at -20°C are greater than 40J and at -40°C its average values are greater than 27J, thus the low-temperature impact energy joint can meet the service requirements of hydraulic support. It shows that choosing proper welding material, developing reasonable welding and post-heating treatment process can cancel the preheating process of Q550 steel welding.

Keywords: HSLAQ550; Non-preheating welding; Low-temperature impact toughness

1. Introduction

In recent years, with the gradually expanding of coal industry, the requirements of the coal mining equipment are increasing, while its performance is also correspondingly improving. As the hydraulic supports of the coal mining equipment work in a harsh environment and withstand dynamic or static load, hydraulic support needs high strength, flexibility is necessary and its work reliability should also be ensured. According to the current production status, the low alloy high strength steel being able to reduce its own weight and improving its strength is the ideal material for hydraulic support.

Hydraulic support welding has always been the concern of the public, Yang Dao-he put forward the traditional welding process of Q550 steel^[1]. Similarly Chen Jun-wei discussed the high strength plate Q550 welding in traditional process^[2]. Gao Jin-you did the welding tests of the same grade steel hydraulic support WH70^[3]. They have guiding significance with hydraulic support welding, especially Q550 steel welding. Li Ya-jiang put forward high strength steel welding process without preheating but he believes that the range of the welding parameters is wide^[4-5]. Further research about hydraulic support welding without preheating has been made aiming at the above problems.

As the hydraulic support material in welding process, high strength low alloy steel Q550 could easily lead to metal chemical composition in HAZ, microstructure and mechanical properties change and prone to appear cold crack and hardened tissue after welding. Therefore, to achieve its welding at room temperature, to reduce welding process and costs and to improve the work environment for workers, it must be controlled combined with some aspects as the chemical composition of the base metal, the mechanical properties, the selection of welding materials and welding process. Further discussion has been made about the welding of hydraulic support Q550 steel without preheating.

2. Experimental

2.1 Test materials

HSLAQ550 is used as test material and its chemical composition is shown in Table 1. The choice of the test weld deposited metal follows the strong match principle. LJ707-CrNiMo used as wire is 700MPa grade structural steel gas shielded flux cored wire which belongs to the alkaline residue lines flux cored wire, with excellent mechanical properties, excellent proliferation performance, low diffusible hydrogen content, good crack resistance, favorable process performance and is applied for flat or horizontal welding. Its chemical composition is shown in Table 2.

2.2 Welding and heat treatment process

The research was processed using the SAFMIG 480Tri welder, protective gas with a purity of 99.3% CO₂, gas flow rate of 24L/min, welding average speed of 150mm/min. other welding parameters are shown in Table 3. The symmetric X-shaped groove is chosen as welding seam groove in the research. The presence of rust, moisture, oil and other impurities within 50mm on both sides of the groove have comparatively large effects on the occurrence of porosity and cold cracking. So the groove must be clearly processed before the welding of Q550 steel. Meanwhile, in order to prevent cold cracking, to reduce the overheating of the weld bead and the weld heat input, the test uses a multi-layer multi-pass welding process is used and the interlayer temperature is strictly controlled between 100 and 150°C in the test. The order is vertically symmetrical welding to prevent deformation.

According to the requirements of the weldments desired performance, the weld toughness can be improved by stress relief processing with post-welding heat treatment. Talking into account of these two factors, security and reliability and ease to operate, its heat treatment specification is ruled as $600 \pm 20^{\circ}\text{C}$.

[Table 1] Chemical composition of Q550 steel

Trademark	Quality grade	Chemical composition P%										
		C	Mn	Si	P	S	V	Nb	Ti	Cr	Ni	Mo
Q550	D	0.05	0.27	1.81	0.01	0.01	0.12	0.09	0.13	0.34	0.04	0.05

[Table 2] Chemical composition of weld wire for LJ707-CrNiMo

Project	C	Mn	Si	Cr	Ni	Mo	S	P
Guaranteed Value	≤0.15	0.75~2.25	≤0.80	≤1.5	1.25~2.6	0.25~0.65	≤0.03	≤0.04
General Value	0.044	1.73	0.28	0.60	1.55	0.61	0.016	0.023

[Table 3] Welding parameters

Wire	Layer	Current (A)	Voltage (V)	Layer Temperature (°C)	Heat Input (kJ/cm)
LJ-707	First	160~180	25.3~25.8	100	14.0
	Second	150~160	25.6~25.8	146	12.8
	Third	140~170	25~27	139	13.0

2.3 Mechanical properties test

According to the provision of GB/T2651-2008 “Welded joint tensile test method”, GB/T2653-2008 “Welded joint bending test method”, GB/T2650-2008 “The impact testing of welded joints”, the tensile test, bending test and impact test were respectively tested on the welded joint of Q550 steel.

2.4 Fracture morphology

Observe the fracture morphology and take picture in Hitachi S-3400N SEM.

2.5 Microstructure observation

Corrode the samples choosing from the base metal, weld zone and HAZ respectively with 4% nitric acid solution, observe its organization under Zeiss microscope and achieve its metallographic photo.

3. Analysis and Discussion of the Test Results

3.1 Mechanical test results and analysis

The mechanical test result of the welded joints is shown in Table 5. According to the result of the data in Table 4, it can be obtained that the yield strength HSLA Q550 steel after welding with LJ707-CrNiMo at room temperature reaches the base metal strength; its impact energy at low temperatures (-20 and -40°C) are respectively, 62J, 32J and no less than 40J and 27J, so it can meet the technical requirements. Based on the requirement of hydraulic support standards of $d=3a$ and performing an angle of 120° bending test, the result of the test is satisfactory.

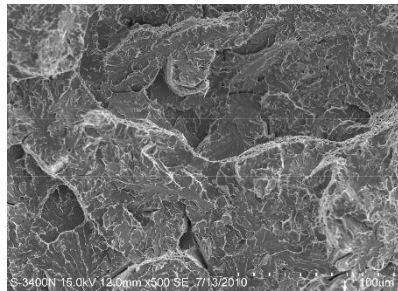
[Table 4] The mechanical test results of welded joints

Tensile Test Results				Impact test results			
ReL	Rm	A	Z25	Test Temperature °C	Notch depth 2mm KV2 J		Tensile Test Results
MPa		%					
640	710	16.5	74.5	-20	Weld Zone	62	d=3a 120°Side Bend Cracks Eligibility
					HAZ	193	
				-40	Weld Zone	32	d=3a 120°Side Bend Cracks Eligibility
					HAZ	223	
Remark: Bending test cracks less than 3 mm eligibility							

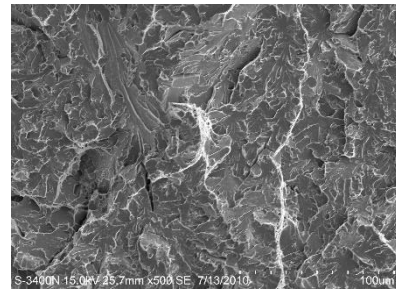
3.2 Fracture morphology and microstructure analysis

In order to have a better analysis and comparison about the impact toughness of the welded joints and HAZ at different temperature, its impact fracture morphology were observed and analyzed at different temperatures. The impact fracture scan of the post-welding weld zone and HAZ at the different temperature, using LJ707-CrNiMo as wire is shown in Fig. 1. The impact fracture of the test sample of weld zone at -20°C shows more quasi-cleavage fracture characteristics shown as Fig. 1(a). Fig. 1(b) shows the impact

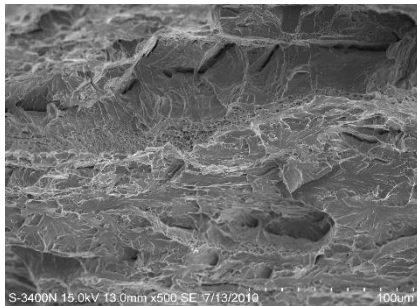
fracture scan of the welded joints at -40°C , which has quasi-cleavage fracture characteristics and little dimples reflected in the picture.



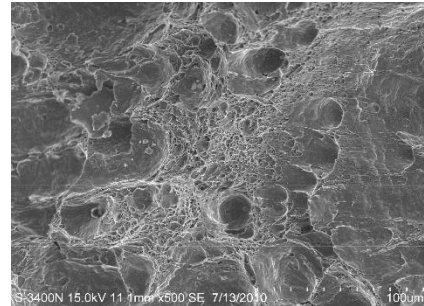
(a) In weld zone at -20°C



(b) In weld zone at -40°C



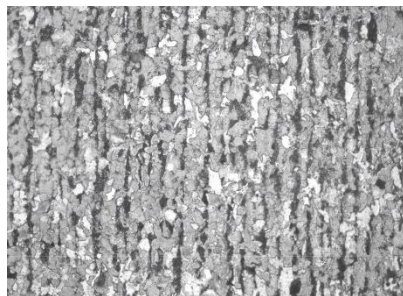
(c) In HAZ at -20°C



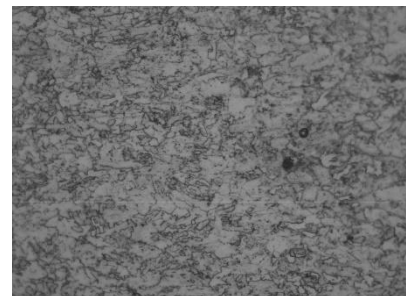
(d) In HAZ at -40°C

Fig. 1 The SEM images of impact fracture of HAZ in different temperature

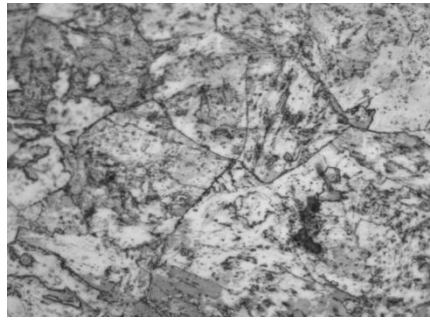
Its toughness decreases significantly compared with that at -20°C , which can also be reflected by the value of its mechanical properties. Good dimple ductile fracture characteristic, more dimples at -20°C in HAZ can be seen from Fig 1 (c) (d), the distribution is also more homogeneous and a significant impact toughness characteristic can be seen. The dimples at -20°C is lower compared with those at -40°C , at the same time more quasi-cleavage fracture characteristics leading to the declining of impact absorbed energy are shown, but the overall HAZ presents ductile fracture. The fracture of the welded joints presents in the form of ductile fracture.



(a) Base metal



(b) The HAZ



(c) The weld zone

Fig. 2 The microstructures of different regions

The microstructures of different regions are shown in Fig. 2. Fig. 2 (a) is the original tissue morphology of Q550 steel. The caustic is 4% nitric acid alcohol. Magnification is 500 times. The base body tissue is P+F, the while tissue is F and the black is P analyzed from the microstructure figure. Besides, there distributes a small amount of cementite, the organization is expressed by bending, its supply state is rolling process seen from the figure. Besides, there distributes a small amount of cementite, the organization is expressed by banding, its supply state is rolling process seen from the figure.

The post-welding microstructure using LJ707 as wire in weld zone and in HAZ is respectively shown in Fig. 2 (b) and Fig. 2 (c). To eliminate stress its process status of welding is non-preheating and tempering at 600°C after welding. It can be obtained by the analysis of the tissue morphology picture that the matrix structure welded with LJ707 after welding is F+P, the organization of the weld zone is coarse and the distribution is not very uniform compared with that of HAZ. The grain boundary can also be clearly seen. Therefore, it can be obtained from the organizational chart that the impact toughness of the weld zone is relatively bad compared with that of the HAZ, but it can meet the requirement of the mechanical properties.

4. Conclusions

(1) The average value of the impact absorbed energy of the weld zone and HAZ after welding with LJ707-CrNiMo Q550 steel at -20°C is greater than 40J, at -40°C its average values are greater than 27J. Besides, the yield strength of the welded joints matches with the strength of the base metal and its flexural ability can also meet the performance requirements of hydraulic support.

(2) The analysis of the welded joints scanning pictures and metallographic photo shows that the organization of HAZ is more uniform and small and the fracture characteristic is dimple ductile fracture and good fracture toughness. The impact test fracture characteristic of the weld zone was quasi-cleavage +some dimples and hybrid fractures and the organization is coarse, despite its impact absorbed energy is low compared with that of the HAZ, it can meet the requirements of its mechanical properties.

(3) Choosing appropriate welding materials, welding process and heat treatment can cancel preheating process of HSLA Q550 before welding.

References

- [1] YANG Daohe, in: Welding Procedure of Q550D Low Alloy Structure Steel on Hydraulic Framework, Coal Technology, 2007, 26(10):8-10.
- [2] CHEN Junwei et al, in: Analysis and Proof of High Intensity Plate Welding Procedure, Modern Manufacturing Technology and Equipment, 2008, 4: 46-47.
- [3] Zhang Lei, LI Yajiang et al, in: Study on welding wire matching of Q690 high-intensity steel used in hydraulic support [J]. Modern Welding, 2010, 1:21-24.
- [4] JIANG Qinglei, LI Yajiang et al in: Research on microstructure and properties and welding material match of Q550 steel[z]. Science paper Online.
- [5] Chen Yuchan, in: Low-alloy structural steel welding technology [M]. Beijing: CHINA MACHING PRESS, 2008,

HSLs-08

Comparative Studies on Adverbial Clause Mongolian & English Languages

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Abstract: Nowadays, the number of people learning Russian in our country has decreased, but on the contrary, the number of people interested in learning and studying English has increased, and foreigners are also learning Mongolian. Also, in accordance with the fact that the teaching of English in all levels of schools in our country is increasing year by year, it is necessary to study the structure of Mongolian and English languages based on specific uses of the language. The goal of this paper is to outline the similarities and differences between English and Mongolian adverbial clauses. As a result of this study it will become easier to translate between English and Mongolian as well as instruct learners on the similarities and differences between English and Mongolian compound sentences, especially those with adverbial clauses. Syntax has a well-established system and is a common unit of many languages, so based on the regularity that every language has a sentence and a sentence system, when discovering the differences and similarities between Mongolian and English adverbial clause sentences, based on the actual facts of the Mongolian literary language, analyze the composition and structure and we believe that this research is important for the study of the syntax of two languages. Mongolian main sentences commonly position is at the end of the sentence, and to express a comment. Many kind of conjunction uses to express adverb depending from form of the sentence. Example; *Bid olon but tarisan učraas ter tsetserleg udahgūj sajhan bolno-* We planted many bushes , so that garden will look nice soon. Adverbial clauses are grammatically less than (subordinate to) sentences, as they do not contain a complete thought. English adverbial clauses always modify the verb in the main clause (the sentence) to which the adverbial clause is attached. An adverbial clause tells how, when, why, how much, to what extent and under what conditions the action in the main clause takes place.

Keywords— *clause, sentence, subordinating conjunction, compound complex, sentence structure*

1. Introduction

The purpose of this research is to compare English and Mongolian grammatical structure, more-over, we want to present a theoretical and practical dissection for English and Mongolian adverbial clauses and to determine their basic form, character, method of combination in sentence clauses. Therefore, to compare study English and Mongolian adverbial clauses form of distinct and classification. Throughout this work we have applied a contrastive approach and inductive approach. And to study to adjust the possibility to translate Mongolian adverbial clause sentences to English, and English adverbial clause sentences to Mongolian. Prior to beginning this paper, the reader must become familiarized with the transliterated Cyrillic alphabet. The modified Cyrillic alphabet used for Mongolian transliteration in this paper is as follows:

[Table 1] Transliteration of Cyrillic alphabet

Cyrillic	Transliteration	Cyrillic	Transliteration
А	a	П	p
Б	b	Р	r
В	v	С	s
Г	g	Т	t
Д	d	У	u
Е	je	Ү	ü
Ё	jo	Ф	f
Ж	ž	Х	h
З	z	Ц	ts
И	i	Ч	č
Й	j	Ш	š
К	k	Ө	u
Л	l	Ы	y
М	m	Э	e
Н	n	Ю	ju
О	o	Я	ja

This research work will be useful for students and researchers for that to compare study English and Mongolian adverbial clauses. Therefore, I chose this topic and to attempted a theoretical and practical dissection for English and Mongolian adverbial clauses. This comparative study's newly issued is will be get easily to translate between English and Mongolian languages and to teach for compare English and Mongolian compound complex sentences, especially, adverbial clause sentences. Because, relatively less to study compare English and Mongolian adverbial clauses sentences structure, connection and ways of to be formed.

2. Survey Research

Domestic and foreign scientists had been executing mainly role to study Mongolian and English adverbial clauses. For example, American linguists Noam Chomsky, Susan Conrad and Douglas Biber, Sandra A. Thompson, Danish linguist Otto Jespersen, English linguist Randolph Quirk, Mongolian linguist Purev-Ochir.B, Bazarragchaa.M, Byambasan.P etc. However, there are a lot of studies that study Mongolian and English adverbial clauses separately, but there are not many studies comparing these two languages, especially adverbial clauses. A compound sentence contains at least two independent clauses. Teuta Agaj [1] said that "The relationship of the clauses in a sentence is especially important concerning complex sentences, in which the clauses are not of the same level but show a dependency. So, precisely the adverbial clauses of time are the ones that are highly complicated and create confusion. For this reason, most of the people try to avoid them, and use simple clauses instead, nevertheless, this somehow loses the meaning and originality of the idea. This means that although complex, adverbial clauses of time are crucial in explaining our ideas and thoughts". We can see from this citation, by using adverbial clauses, we can provide additional detail and context to a sentence, making it more precise, informative, and interesting. Adverbial clauses can also help to vary sentence structure and style, creating more complex and sophisticated sentences. By using different types of adverbial clauses, such as clauses of time, place, condition, or concession, we can convey different shades of meaning and convey the speaker's attitude or point of view. Example: *If the weather is fine, we shall spend our day off in the country-Herev tsag agar saijhan bajval bid amraltyn үдрийг хийдэг үнгүрүүлнэ.*

Furthermore, adverbial clauses can be used to show relationships between different ideas and to create logical connections between sentences. For example, using an adverbial clause of cause and effect can show why something happened, while using an adverbial clause of comparison can show how two things are similar or different. Example: *I must do the job myself since you will not help me- чи надад туслахгүй учир би ахлаа үүрүүг хийж жостой.*

Some Mongolian linguists comparing English and Mongolian adverbial clauses, for example, Khajidsuren.N, Bayarmaa.Ts, Oyuntsetseg.J, Narandelger.D and Gun-Uils.D. Bayarmaa.Ts [2] said that, determiner of verb expands the action by stating when, where, how, and why of the main clause happened. And she divided the determiner of verb *clause of time (үйлжн тсэг заасан)*, *clause of place (үйлжн байр заасан)*, *clause of reason (үйлжн шалтгаан заасан)*, *manner (үйлжн байр байдал заасан)*, *clause of purpose (үйлжн зорилго заасан)*, and *contrast (есрегtsel заасан)*. But, Gun-Uils.D [3] and Oyuntsetseg.J [5] are English adverbial clauses are divided; adverbial clause of time, adverbial clause of place, adverbial clause of cause, adverbial clause of manner, adverbial clause of result, adverbial clause of concession, adverbial clause of purpose, adverbial clause of condition. Prof. Khajidsuren.N [12] research mainly focuses on Mongolian and English compound sentence with a definite article, and Mongolian and English compound sentence with a undefined article.

We agree with Gun-Uils.D and Oyuntsetseg.J's classification, because most researchers have classified adverbial clause this way. Prof. Oyuntsetseg.J [5] noticed that about the most common conjunction and conjunctive words of English as follow:

[Table 2] The most common conjunction and conjunctive words of English

Type of clause	Conjunction and conjunctive words	Examples
Adverbial clause of time	when, while, as, until, once, before, after, as soon as, till, whenever	When I came from the country, this house was being built.
Adverbial clause of place	where, wherever	Now I work where my father worked.
Adverbial clause of cause	because, since, as, for the, reason that, considering that	As he didn't prepare for the exam, he couldn't answer most of the questions.
Adverbial clause of result	so that, so ... that	The car was so expensive that I couldn't buy it.
Adverbial clause of purpose	in order that, that so that	He hurried to the station in order that he might catch the 7 o'clock train
Adverbial clause of manner	as if, as though, than, the ... the	He was sleeping calmly as if nothing had happened to him.
Adverbial clause of condition	if, unless, suppose, provided, providing, as long as	What will you do if you are elected again?
Adverbial clause of concession	though, although, even if, however, whatever, whichever	Though he recognized her, he didn't greet her.

3. Methods

In doing so we have attempted to use research coming from both Mongolian and foreign sources. In essence a sentence in any language can be defined as a group of words which are tied together and convey an idea, event or description. Complex sentences describe more than one thing or idea and have more than one verb in them. They are comprised of more than one clause, an independent clause (that can stand by itself) and a dependent (subordinate) clause (which cannot stand by itself). In other words,

an independent clause (or main clause) contains both a subject and predicate, can stand alone as a sentence (a simple sentence), or be a part of a multi-clause sentence. A dependent clause (or subordinate clause) contains both a subject and a verb but cannot stand alone as a sentence, it must always be a part of a main clause on which it depends for meaning. Reading a dependent clause on its own leaves the reader wondering where the rest of the information is. The following sections describe the different kinds of dependent clauses. An adverb clause or adverbial clause (also called a subordinate clause) is a type of dependent clause which starts with a subordinating conjunction (e.g. *because, although, when, if, until, as if* etc.). It indicates a dependent relationship with information elsewhere in the independent clause that it modifies. Similarly, to adverbs, adverb clauses usually answer questions such as: Why? How? When? Under what circumstances? The characteristics of English and Mongolian complex sentences are similar. For example: when the English adverb clause is written before the independent clause, the two clauses are separated by a comma. In other words, when an adverbial clause is used to begin a sentence in English a comma is used to separate the two clauses. Example; *Because he had to work late, we had dinner after nine o'clock.* In contrast when the English adverb clause finishes the sentence there is no need for a comma. Example; *We had dinner after nine o'clock because he had to work late.* But an adverb clause begins and finishes either the Mongolian sentence don't use a comma to separate the two clauses. Example; *Bi nom unšiz ehelmegets büh jumyg martdag-* As soon as I start to read a book I forget everything.

Because Mongolian adverb clauses commonly position is beginning of the sentence. The adverbial clause is determinant clause in the sentence and that character is similar in Mongolian and English languages. Mongolian main sentences commonly position is at the end of the sentence, and to express a comment. Many kind of conjunction uses to express adverb depending from form of the sentence. Example; *Bid olon but tarisan učraas ter tsetserleg udahgüj sajhan bolno-* We planted many bushes , so that garden will look nice soon. Adverbial clauses are grammatically less than (subordinate to) sentences, as they do not contain a complete thought. English adverbial clauses always modify the verb in the main clause (the sentence) to which the adverbial clause is attached. An adverbial clause tells how, when, why, how much, to what extent and under what conditions the action in the main clause takes place. English adverb clauses commonly structure is main sentence + clause sentence, and these sentences are connected with conjunction.

4. Results, Data Analysis

Adverbial clauses always begin with a subordinating conjunction. The most common subordinating conjunctions are listed below:

[Table 3] The most common subordinating conjunctions of English

	Conjunctions	Examples
1	after	After the agreement had been signed, the delegation left Sidney.
2	although	I would like to go out although it is raining.
3	as	As the chief guest arrived, we all stood up
4	as if	He spoke as if he knew this question very well.
5	as soon as	As soon as we received your letter, we tried to look through the list.
6	because	He thinks he can get anything because he is rich.
7	before	I always take a shower before I go to bed.
8	if	If I see him tomorrow, I shall ask him about it.
9	in order that	He drew the sword in order that he could defend himself.
10	since	We have not had any news from him since he left New York.
11	so that	I am working hard so that I can pass the test.
12	that	I am glad that you have come
13	though	Though he recognized her, he didn't greet her.

14	unless	He won't go there unless he is invited.
15	until	Let us wait until the rain stops.
16	when	When we arrived at the school, the teacher was gone.
17	whenever	Whenever I get an idea for a story, I jot it down in a notebook.
18	where	Young people have to go where they can find jobs.
19	wherever	Wherever you go, you will find coca cola.
20	while	While you are having dinner, I shall be reading the newspaper

We can observe from these adverbial clause sentences as follow; a) Sometimes in English a clause sentence is situated middle and end of the sentence, depending from modify connection of clause sentence. When they appear before the independent clause, they are usually separated from it by a coma, b) They are dependent clauses: Adverbial clauses cannot stand alone as complete sentences because they lack a subject-verb pair that would make them independent clauses. Instead, they must be attached to an independent clause to form a complete sentence Mongolian adverb clauses structure is clause sentence + main sentence, and these sentences connected with conjunction and suffixes. The most common conjunctions and suffixes are listed below:

[Table 4] The most common conjunctions and suffixes of Mongolian adverbial clauses

Conjunctions	Examples	Suffixes	Examples
hurtel	Čamajg ireh hurtel bi endee hūleež bajja.	-saar4	Üherčün hūvgūn Tserendorž bi ...ūdrīgj ūnžin hariulsaar naadaž suuna aa, naadaž suuna aa.
met	Tashijm hūjten ūvlijn šūnū tengerijn od oč met gjalalzaad ...	-tal4	Bat ūtgūn ūvstej sajhan tal dunduur davhisaar javtal hojor tsagaan ger ūzegdev.
šig	...Enehūū suvargyn šavar hana zeregleen dund ūlgerijn ord harš šig haragdah ni gajhamšigtaj.	-magts4	Üürjijn tujaa gegeeren tusmagts, enetee uulyn orojd hūhūū šuvuu jaruuhān dongodno.
tul	Minij hūū onts sursan tul ūvlijn ūvgūnūts beleg avna.	-hlaar4	Eej ni hūūgee irehleer zūūn hatsryg ni ūnsene.
		-nguut2	Čamajg hūūūūūūūū irengūūt būgdeeree ajalald javtsgaaja.
		-ngaa4	Būgdeeree hičeelee hijngee gerece tseverleje.
učraas	Havar bolson učraas udahgūj tsas hajlān.	-val4 -bal4	Цүнцū šūnū honi uruudval ūghūū bosood Dorj zūderne.
učir	Ulaan jamaat uulyn ner ni jamaany ulaanyg zaasny učir būrtgeldee oruulsangūj.	-vč	Haluun nar šarž toos šoroo bušjgnavč ūūrijn tjeatryg bosgož bajgaa bolohoor ard tūmen ih bajartaj bajlaa.
adil	Zovson hūnd uurlah šaltgaan mundahgūj bajdgijn adil žargaltaj hūnd ineeh učral zahaas avaad belen bajdag bilee.	-d	Мүчир ni hugarahad sūūder ni hugarna.

Mongolian main sentence is to expand by clause sentence. The clause sentence is to expressing manner, time, reason and condition. Example; *Bi očmogtsoo chamd zahia bične-* As soon as I get there, I'll write you a letter. *Ter nadad ene tuhaj jariagūj bolovč bi medsen-* Although he hadn't talked with me about this I knew it. In Mongolian adverbial clause the predicate of a sentence begins with one of the above suffixes. We can observe from English and Mongolian adverbial clauses that meanings and forms are generally similar, when we underline for clause sentences

[Table 5] Adverbial clauses meanings and forms in Mongolian and English

Mongolian	English
{Tanyg üdijn hooloo idež baih zuur} bi sonin unšiž baija	{While you are having dinner}, I shall be reading the newspaper
{Tüüniyg ireh üjed} bid ali hedijn javčihsan bajsan	{By the time he arrived}, we had already left
{Tog tasarval} laa asaadag	{When the electricity is cut} a candle is lit
{Širuun boroo orvol} ujer boldog	{When it rains} there are floods
{Ajl ehelbel} duusgah heregtej	{When you start a job} you have to finish it
{Aavijg irvel} bid hamt hool idne	{If dad comes} we'll eat together
{Tsunh olbol} nadad uгуurej	{If you find a bag}, please give it to me

We can look that the above examples, Mongolian suffixes – val⁴ –bal⁴ are to show to be a similar meaning to the English subordinating conjunction “when, if “and also generate an adverbial clause sentences. But, Mongolian analytical methods “-ž baih zuur” and “-h üjed” are to show to be a similar meaning to the English subordinating conjunction “while, by the time“and also generate an adverbial clause sentences. The approximate meanings of adverbial clause English and Mongolian conjunctions and suffixes are listed below.

[Table 6] Approximate meanings of adverbial clause English and Mongolian conjunctions and suffixes

Mongolian suffixes	English conjunctions
-tal ⁴ Ojutnuud jil bur 9 saryn 1 boltol amardag	as , although,until Every year the students are on vacation until September 1st
-magts ⁴ Ter hojoryg holdmogts manaj mori irlee	As soon as, just as , just after As soon as those two went away our horse come
-hlaar ⁴ Šunı čono irehleer nohoj hutsan honi urgelee	When When a wolf come at night , the dog barked and sheep became alarmed
-nguut ² Utas duugaranguut ochij awsan	As soon as,the moment,while The moment the phone rang , went and got it
--vč Tuya ažil ihteј bolovč oros hel surč bajna	Although Although Tuya has a lot of work, she studied Russian
-saar ⁴ Bid ene sajhan ajrgijg uusaar barag duusgčhlaa	Have been . . . ing We almost finished this good airag , having been drinking it continually

[Table 7] Approximate meanings of adverbial clause English and Mongolian conjunctions

Mongolian		English	
conjunctions	examples	conjunctions	examples
hürtel	Ter 12 sar хүртel end bajna	until	He'll be here until December
met	Xoyor xun evtej bol түмүр xerem met	like...as...as	When two people are friendly, they are as strong as an iron wall
šig	Nad šig zalhuu хүн bajhguј bajh	like...as...as	There is probably no person as lazy as I am
tuld	Či juny tulд ene buhniyg hijž bajna ve?	in order to	What are you doing all this for (in order to)
түлүү	Bi tany түлүү бүhniyg hijne	for	I'll do everything for you
učir	Bi үнүүдүр hičeelgui učir nomyn sand očij nom unšiv	because	Because I don't have school today, I went to library and read a book

uĉraas	Bilet duussan uĉraas Bi kino uzsengui	since	Since the tickets were sold out, I didn't see the film
tul	Galt tereg 5 tsagt ireh tul hurdan javah heregtej	because	We have to go to fast because the train comes at 5 o'clock
gevcĉ	Dorj šatar sajin togloodog, gevcĉ hul bımbıg togloodoo taaruhan	but	Dorj plays chess well, but he doesn't very good in football
hojno	Bi tuunees 10 tsagijn hojno javna	after	I'll 10 hours after he goes

English and Mongolian adverbial clauses are similar in that they both function as subordinate clauses that modify the main clause of a sentence. They also both indicate a temporal, causal, or conditional relationship between the main clause and the subordinate clause. However, there are some differences between English and Mongolian adverbial clauses. One major difference is that English adverbial clauses are often introduced by subordinating conjunctions such as "if," "when," "because," and "although," while Mongolian adverbial clauses can be introduced by conjunctions or particles. Furthermore, the position of the adverbial clause in the sentence can also differ between English and Mongolian. In English, adverbial clauses are often placed before or after the main clause, while in Mongolian, adverbial clauses can come before or after the main clause, but the order is less rigid.

5. Conclusion

How I would phrase this: "English and Mongolian compound sentence structures are similar in that they both follow the sentence + sentence format. In English sentences the main and dependence sentences are easily separated and identified by their conjunction, where as Mongolian complex sentences do not have as discernable a way to separate complex sentences."

An adverb clause or adverbial clause (also called a subordinate clause) is a type of dependent clause which starts with a subordinating conjunction (e.g. *because, although, when, if, until, as if* etc.). It indicates a dependent relationship with information elsewhere in the independent clause that it modifies. Similarly, to adverbs, adverb clauses usually answer questions such as: *Why? How? When? Under what circumstances?* These characteristics are held in common by both the Mongolian and English language. We can observe from English and Mongolian adverbial clauses that meanings and forms are generally similar, when we underline for clause sentences. Example; {Tog tasarval} laa asaadag- {When the electricity is cut} a candle is lit. {Tsunh olbol} nadad uguurej- {If you find a bag}, please give it to me. English adverb clauses commonly structure is main sentence + clause sentence, and these sentences connected with conjunction. But Mongolian adverb clauses structure is clause sentence + main sentence, and these sentences connected with conjunctions as well as suffixes.

Acknowledgment

I would like to thank William Schlack (volunteer of Peace Corps), for his valuable help and advice. He provided me with during my work on this paper.

References

*Journal article

Teuta Agaj. (2015), “Mistakes that students of English Language make in using adverbial clauses of time”, THESIS, Vol. 4, no. 1, pp.67-73.

*Book

Ц.Баярмаа.(2017), “Англи хэлний өгүүлбэр зүй” Удам соёл, Улаанбаатар
Д.Гүн-Үйлс. (2019), “Англи-Монгол зэрэгцүүлсэн хэл зүй” Мөнхийн үсэг, Улаанбаатар
Д.Нямжаргал ба Г.Валябуу. (2021), “Англи хэлний дүрэм” Мөнхийн үсэг, Улаанбаатар
Ж.Оюунцэцэг. (2014), “Англи хэлний зүй” Урлах эрдэм, Улаанбаатар
Ц.Өнөрбаян ба бус. (2020), “Орчин цагийн монгол хэл-II” Бит пресс, Улаанбаатар
Б.Пүрэв-Очир. (2001), “Орчин цагийн монгол хэлний өгүүлбэр зүй” Мөнхийн үсэг, Улаанбаатар
Б.Түвшинтөгс ба О.Шинэбаяр. (2022), “Хэл шинжлэл-Соёмбо нэвтэрхий толь” Соёмбо пресс, Улаанбаатар
Ү Зайжөн. (2020), “Орчин цагийн монгол хэлний өгүүлбэр зүй” Жилиний гадаад хэлний их сургууль, Улаанбаатар

* Web

- [10] “Adverbial clauses”, (2018), [file:///C:/Users/Administrator/Downloads/Thompson-Longacre-Hwang-adverbialclauses%20\(1\).pdf](file:///C:/Users/Administrator/Downloads/Thompson-Longacre-Hwang-adverbialclauses%20(1).pdf)
- [11] “Байц гишүүн өгүүлбэрийг монгол, англи хэлэнд харьцуулан судлах нь”, (2020), <https://www.scribd.com/document/559919018/%D0%9F-%D0%9E%D1%82%D0%B3%D0%BE%D0%BD%D0%B6%D0%B0%D1%80%D0%B3%D0%B0%D0%BB>
- [12] “Монгол,, Англи хэлний байц гишүүн өгүүлбэртэй угсарсан нийлмэл өгүүлбэрийн зэрэгцүүлэл ”, (2000), <http://122.201.23.45/cgi-bin/koha/opac-detail.pl?biblionumber=12040>
- [13] “What is an adverbial clause”, (2022), <https://www.grammarly.com/blog/adverbial-clause/>

SSS0-09

A Study of Some Affecting Factors in Marital Satisfaction

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Abstract: In 2011-2022, Mongolia registered approximately 16.734 marriages annually in average while the average annual marriage annulment made 3632 for this period (National Statistics Office, 2022). In accordance with these statistics, one-fifth of marriages or 21.7% of total marriages ended with divorce. One of the main factors of happy and sustainable marriage is marital satisfaction; however, marital satisfaction has been influenced by personal behavior, typology, self-esteem, socio-demographic factors. Within the framework of the research work, we have purposed to research the influences and affects of socio-demographic factors such as age, gender, couple's ages or age difference, educational backgrounds, labor occupation, household income level, number of marriages, number of children, marriage durations on the marital satisfaction of the couples. The survey was conducted randomly among 207 married people of 20-40 years of age. According to the survey results, the following factors influence marital satisfactions: age, gender, and number of marriages.

Key words: marital satisfaction, happy marriage, sustainable marriage, factors of marital satisfaction, marriage.

1. Introduction

An adult is able to take an active participation in the social relations, to choose the lifestyle, to take a legal responsibility, and to make an independent marriage solution in accordance with own wills. Marriage decision is a personal decision; however, in a wider meaning, it is a social issue. A sustainable and happy marriage has positive influences on personal and social life. The marriage makes a reason and conditions for the formation of the personality. A happy and sustainable marriage shows a positive influence on the mental health, performance at work and other life activities of family members. Researchers consider marital satisfaction as one of the main factors influencing happy and sustainable marriages. Not only personality features, but also socio-demographic factors influence marital satisfaction.

Researchers have studied influences of socio-demographic factors on the marital satisfaction as follows:

- Results of research works on marital satisfaction in connection with the age of married couples misstate. In accordance with some research work results, the older the couple gets, the higher the marital satisfaction rate was; however, another survey says age does not matter for marital satisfaction. Utah University Professor Nicholas Wolfinger considers the ideal age for a sustainable family is between 28-32. It makes the family more stable and the divorce rate is reduced. He considers that marrying too young was cited as a major reason for divorce (Nicolas.H.W, 2003).

- According to the gender and marital satisfaction interdependence surveys, some scientists (Vemer.E., Coleman.M., Cooper.H., Ganong.L, 1989) consider men have higher marital satisfaction rates than women but other scientists (Karney.R.B., Bradbury.T.N, 1995), consider women have higher marital satisfaction rates than men while results of research works conducted by some scientists such as “Influences of gender differences on marital satisfaction” by Jeffrey and Richard (Jeffrey.B.J., Richard.B.M., Megan Oka., Ryan.G.H, 2014) consider the marital satisfaction rate between men and women was same.
- Feldman and Rollins (1970) studied influences of marital duration on the marital satisfaction level. They found that marital satisfaction was high in the first years of marriage, then, it declined in the middle of family life and again increased after 18-20 years of life together. Relationships between marital satisfaction and educational backgrounds are varies by country. In some countries, few studies showed education level is related to marital satisfaction, while in other countries, there was a result that these two indicators were not related to each other.

According to the results of research works on correlation between marital satisfaction and socio-demographic factors, it showed comparatively different results depending on the culture, traditions and customs, social and economic features of the country.

In this study, we proposed to clarify the influence of socio-demographic factors on marital satisfaction of Mongolian married couples 20-40 years of age.

2. Survey Research

2.1 Marriage

Up to the 1980s, family studies developed as an applied science of natural and social sciences such as history, ethnology, pedagogy, and medical science. Marriage and family are social forms to regulate relations between family members and spouses. As one of the smallest social groups consisting of spouses, siblings, grandparents, the family becomes the primary environment for a human being to grow up and develop (Batsaikan.B., Delgerjav.M, 2013).

A scientist A. A. Obozova, who studied family from a psychological point of view, considers the psychological internal essence and values of spouses are vital for family life. Psychological internal essence and values includes some positive characteristics such as generosity, politeness, love and care, gentle and fair attitudes, honesty, straight thinking and the ability to compromise, which are a vital for warm and positive family relationships (Battsebgel.G., Bandikhuu.B, 2012).

Marriage is a relationship based on the feeling of love. A psychologist E. Fromm considered, “Love is the only satisfactory thing to answer the question about the existence of persons” (Batsaikhan.B., Delgerjav.M, 2020).

Marriage is the foundation of family development as marital satisfaction is the basis of stable marriage and happiness and satisfaction of family members; i.e., the more the spouse is satisfied with the marriage, the more their family relations will be positive, and this will have a positive effect on all family members. Family researchers, Namjil T, Tungalag D, and Uvsh P have determined the importance of the family stability as follows:

1. Influences on the personal development
2. Influences on the development of inner mind
3. Forms the essences of nation and family
4. Strengthens blood relations of both sides
5. Influences on the longer life expectancy and healthy life
6. More feeling of happiness and contentment
7. Better conscience of creativity and civil duties. It shows that marital satisfaction creates and brings many privileges to married people.

2.2 Marital satisfaction

Hendrick. S determined marital satisfaction as a subjective feeling of happiness and satisfaction in the marriage relationships. Researchers, D. F. Franck and Ross May considered that marital satisfaction is the assessment of married couple in their relationship, and marital satisfaction is defined as an attitude to their relationships (Frank D.F., Ross May., Steven F.D, 2016) while researchers explained that it is also related to the subjective feeling of happiness in their marriage (Gottman J.M., Hawkins M.W., Carrere.S, 2002). Marital satisfaction is a personal tendency of subjective evaluation to summarize his family relationship from an emotional point of view. Subjective marital satisfaction can be determined by the tendency of the couples to perform their roles in reality. The reasons for low levels of subjective marital satisfaction in marriage can be explained through failure to enhance the realistic needs of the couple, or they have too high and unrealistic expectations on their marriage or spouse (Battsebgel.G., Bandikhuu.B, 2012).

Summarizing the researchers' definition of marital satisfaction:

- Marital satisfaction is referred to as a subjective evaluation that covers all aspects of family relationships.
- Marital satisfaction is referred to as a concept that expresses the level of conformity in which a person's marital relationship is compatible with their feelings.

Researchers, Helen Kh. Fung and Tianyuan Li promoted a theory of the dynamic objective of marital satisfaction. They considered that the objectives of married people influence their marital satisfaction as the objective might change in connection with their ages. For example:

- a) Objectives of young married couple tend to their personal development,
- b) Objectives of middle-aged married couple tend to their operational activities,
- c) Objectives of older married couples tend to be friendship. These objectives influence their marital satisfaction, and when their objectives are fulfilled, their marital satisfaction level will be higher (Li Tianyuan., Fung H.H, 2011).

According to equity theory, the extent to which married couples treat each other equally affects their marital satisfaction; i.e. the couple with equal relationships are more satisfied with their marriage (Mary.K.U., Elaine Hatfield., David.G., 2016)

2.3 Factors on Marital satisfaction

In addition to personality, socio-demographic factors such as social and economic status, educational background, religion, age, marriage duration, number of marriages, and number of children, and other factors such as love, trust, mutual respects, and equal relations also influence marital satisfaction.

Researchers, Rosen-Grandon (1998) and Kaslow & Robinson (1996) considered that long-term satisfied family relationship might be influenced by love, respects, trusts, commitment, equality of roles, gender roles, and sexual relations of the couple.

One of the major factors that influence marital relationships is the transition to parenthood. Children have certain influences on family relationships. According to most studies, children improve family stability but decrease marital satisfaction (Belsky, 1990; Waite & Hillard, 1991). On the other hand, children also show positive influences to overcome unpleasant relationships and conflicts during the family transition period, and to make husband and wife closer and more intimate (Gritz, Wellisch, Siau, Jessie, Wang 1990). Emily, A. Stone, Todd, and K. Shackelford (2006) considered that marital satisfaction may be influenced by cognitive, physiology, interactions style, social supports, spousal protection, children, family background and environment, adult adaptation, personality traits of spouses, temperament, and self-esteem of spouse.

3. Methods

In order to enhance the research work objectives, we have used the questionnaire developed by us in order to determine the marital satisfaction level of respondents through inclusion of socio-demographic information data to take a marital satisfaction scale (IMS) and to obtain other necessary information data. Socio-demographic factors include age, gender, age differences of the couple, educational background, occupation, household income, the number of marriages, marriage duration, and number of children etc. Socio-demographic factors are collected through a questionnaire with 10 structured questions.

Marital satisfaction is determined through Walter Hudson's Index of Marital satisfaction that consists of a questionnaire with 25 questions and data. Index of Marital satisfaction have to score levels where the first level of 30 or more scores shows a higher marital satisfaction level. Scores between 31-69 show a medium level of marital satisfaction. The second level of marital satisfaction is 70 scores where higher scores show the lower satisfaction levels. To calculate scores, answers to questions 1, 3, 5, 8, 9, 11, 13, 16, 17, 19, 20, 21, and 23 shall be calculated in reverse orders. Index of Marital Satisfaction is calculated through the following formula.

$$IMS = \frac{((Y_1 + Y_2 + Y_3 + \dots + Y_n) - n) * 100}{(n * 6)}$$

IMS – Index of Marital Satisfaction, Y_1, Y_2, Y_3 – Scores of every question, n – the number of answered questions, respectively.

Reliability analysis: Reliability analysis was conducted on questions of Index of Marital Satisfaction where alpha coefficient shows the reliable statistics data of .963.

Reliability Statistics		
	Cronbach's Alpha	N of Items
IMS	.963	25

4. Results, Data Analysis

4.1. General information on research participants

The survey was conducted on randomly chosen 207 married people of 20-40 years. By gender, 41% or 85 of participants are male while 59% or 122 are female. By age classification, 8.6% are up to 20-25 years of age, 15% are between 26-30 years of age, 34.8% - between 31-35 years of age, and 41.6% are up to 36-40 years of age, respectively.

The average age of the women in the research work was 34, where the youngest was 22 years of age. For men, the average age was also 34, where the youngest was 20 years old. We considered the maximum and minimum data by age differences between the couple: women were 10 years older or 10 years younger than their husband at maximum while men were 9 years older or 5 years younger than their wife, respectively.

Table 1. Age of Research Participants (Age of spouse)

Report				
Gender		Gap	Your age	Age of spouse
Male	Mean	1.0976	34.4353	33.2683
	Minimum	-5.00	20.00	21.00
	Maximum	9.00	40.00	44.00
Female	Mean	-1.2750	34.6803	35.9417
	Minimum	-10.00	22.00	21.00
	Maximum	10.00	40.00	50.00

Chart 1. Gender

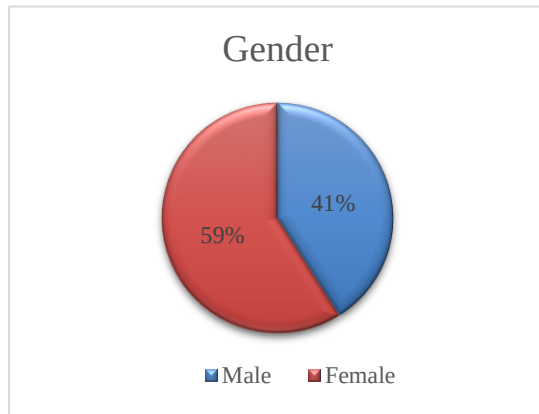
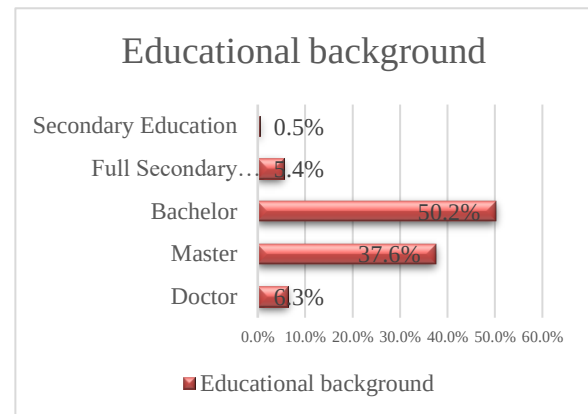


Chart 2. Educational backgrounds

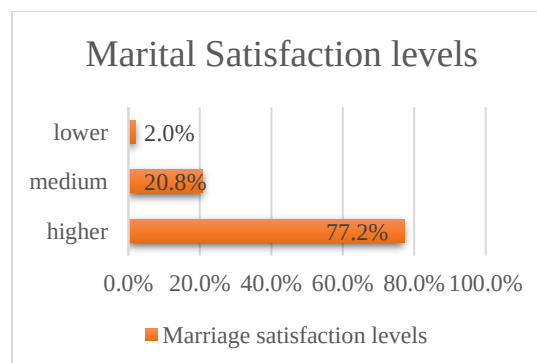


Moreover, 91.3% of respondents had their first marriage while 8.7% remarried. The duration of marriage was from 6 months up to 18 years. By the number of children, 62.3% of families had 1-2 children, 27.5% had 3-4 children, 0.5% had 5-6 children, while 9.7% had no children. By educational background, 13 persons gained Doctor's degree, 77 people gained Master degree, 103 persons gained Bachelor degree, 11 persons were fully secondary educated, and 1 person was secondary educated, respectively. And 191 persons were employed while 13 persons were unemployed.

4.2. Results of marital satisfaction measurements

Marital satisfaction scores of respondents were between 11-91 scores. Marital satisfaction level can be grouped into three sections where marital satisfaction level was higher for 77.2%, medium – for 20.8%, and lower for 2.0%, respectively.

Chart 3. Marital Satisfaction



4.3 Regression analysis results

As the purpose of the research work, analysis was made to clarify socio-demographic factors influences on the marital satisfaction of the person.

- Relevant variables: Marital Satisfaction
- Irrelevant variables: Age, gender, age differences of the couple, the number of marriages, marriage duration, the number of children, educational background, labor occupation, household income, and the number of family members etc.

Through three staged regression analysis, three models were developed where models one and two were irrelevant (P Value >0.05) while model three was relevant (P Value <0.05). Therefore, we considered variables important and influential to the Model Three.

(1) Regression equation:

$$Y=C+B_1*X_1+B_2*X_2+B_3*X_3 \dots B_n*X_n$$

(2) IMS model:

$$Y_{IMS}=32.354+(-8.695)*\text{the number of marriages}+(-0.680)*\text{Age}+4.815*\text{Gender}$$

Whereas, Y-marital satisfaction, X_1 , X_2 , X_3 -socio-demographic factors, respectively.

Model Three was the most influential and descriptive (R^2 - 24.5%) where the biggest numbers of variables were relevant. For instance:

1. The number of remarriages has inverse relations as the result of the research work shows a decrease of 8.695 unit (B -8.695 unit) in the marital satisfaction upon 1 unit increase in the number of remarriages; i.e., a person is more satisfied with his/her first marriage; however, the marital satisfaction reduces on the remarriage.
2. The age of a person has inverse relations: When the age of a person is increased by 1 unit, the marital satisfaction reduces by 0.680 units (B -.680).
3. Gender influences on marriage: Men are more satisfied with their marriage or 4.815 units (B 4.815) higher than women.

Other irrelevant variables such as age difference between the spouses, duration of marriage, the number of children, educational background, labor occupation, household income level, and the number of family members do not influence marital satisfaction.

Table 2. Regression analysis to determine Marital Satisfaction and Socio-Demographic Factors influences

	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
(Constant)	18.003#	12.200		14.772#	12.098		32.354	13.440	
Number of marriages	-11.408	4.258	-.172**	-11.223	4.201	-.170**	-8.695	4.175	-.131*
Age							-.680	.241	-.182**
Gender							4.815	2.343	.129*
R ²	.172			.198			.245		
Adjusted R	.163			.186			.226		
Durbin Watson	2.144								
*p<0.05, **p<0.01, ***p<0.001, # nonsig									
Age: 0 - Women, 1 - Men									

The results show that the older the respondents get, the marital satisfaction rate reduces. Within the framework of the research work, aging means the respondents are reaching the age of 40. At that time, most of the families have teenage children that might also influence the family relations and marital satisfaction; i.e., according to the researchers, the marital satisfaction level reduces in teenage years of children and increases again when the children grow and become adults.

5. Conclusion

A stable and happy marriage has positive influences on personal and social life. One of the main factors influencing a happy and stable marriage is marital satisfaction. Marital satisfaction is an evaluation given by the married person on his marital relations. Marital satisfaction can depend on not only the personality of the person, but also socio-demographic factors. Upon revision of the research work results, the following social and demographic factors influence the marital satisfaction:

- The number of remarriages has inverse relations as the result of the research work shows a decrease of 8.695 unit (B -8.695 unit) in the marital satisfaction upon 1 unit increase in the number of remarriages; i.e., a person is more satisfied with his/her first marriage; however, the marital satisfaction reduces on the remarriage.
- The age of a person has inverse relations: when the age of a person is increased by 1 unit, the marital satisfaction reduces by 0.680 units (B -.680).
- Gender influences on marriage: Men are more satisfied with their marriage or 4.815 units (B 4.815) higher than women.

However, other irrelevant variable such as age difference between the spouses, duration of marriage, the number of children, educational background, labor occupation, household income level, and the number of family members do not influence marital satisfaction in accordance with the survey results.

In comparison with similar researches and survey works conducted in other countries, influences of socio-demographic factors are various depending on the culture of these countries. Such an image is also clear in our research work. For instance: researches in some countries show the influences of the number of children on the marital satisfaction rate; however, our research work showed no influences. Moreover, household income rate showed more influences on marital satisfaction rates of Japanese women; however, our research work shows that household incomes have no influences on the marital satisfaction rates of men and women.

I. REFERENCES

- Batsaikan.B., Delgerjav.M. (2013). *The Social Psychology*. Ulaanbaatar city: Soyombo Publishing.
- Batsaikhan.B., Delgerjav.M. (2020). *The Psychology of love*. Ulaanbaatar city: Soyombo Publishing.
- Battsebgel.G., Bandikhuu.B. (2012). *The Psychology of family*. Ulaanbaatar city: Soyombo Publishing.
- Frank D.F., Ross May., Steven F.D. (2016). *Positive Approches to Optimal Relationship Development*. Cambridge University Press.
- Gottman J.M., Hawkins M.W., Carrere.S. (2002). Marital sentiment override: Does it influence couples' perception. *Journal Of Marriage and Family*, 193-202.
- Jeffrey.B.J., Richard.B.M., Megan Oka., Ryan.G.H. (2014). Gender Difference in Marital Satisfaction. *Marriage and Family* .
- Karney.R.B., Bradbury.T.N. (1995). *The longitudinal course of marital quality and stability: A review of theory, methods, and research*.
- Li Tianyuan., Fung H.H. (2011). The Dynamic Goal Theory of Marital Satisfaction. *General Psychology*, 246-254.
- Mary.K.U., Elaine Hatfield., David.G. (2016). Equity, Marital Sarisfaction, and Stability. *Journal of Social and Personal Relationships*, Volume 3, Issue 3.
- Nicolas.H.W. (2003). Parental Divorce and Offspring Marriage: Early or Late. *Social Forces, Oxford Academic*, Vol 82, 337-353.
- Vemer.E., Coleman.M., Cooper.H.,Ganong.L. (1989). Marital Satisfaction in Remarriage. *Marriage and Family*.

SSSED-10

Study on the Psychological Behavior of a Codependent Family Member of an Alcoholic

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Abstract: The codependence of alcohol, which has attracted the attention of world psychologists, is a relatively new topic for researchers in Mongolia. A person with alcoholism is a person who is dependent on alcohol, while his family members are also codependent on alcohol. Alcohol codependency refers to a family member or loved one who struggles to keep a person with alcohol addiction away from the disorder. Fathers, mothers, brothers, sisters, spouses, and children of a person with alcohol addiction suffer from psychological and behavioral problems. This is called codependency in Addiction Medicine. Family members, including women, especially wives, become victims of alcohol dependence in terms of their health and psychological well-being, and the family life becomes abnormal and vulnerable. In the framework of this article, a total of 100 women, 67 with codependence on alcohol and 33 in the control group, aged 32-58 years, were studied. As a result of this study, we aimed to compare the psychological and behavioral changes of the wife of an alcoholic and the wife of a non-alcoholic.

Key words : alcohol, codependence, psychology of a wife, women

1. Introduction

The psychological basis of the codependency of alcohol is that the wife of an alcoholic man deceives himself as if the problem does not exist, and knows that there is a problem, but refuses to admit it. Most wives of codependent alcoholic men ignore the consequences of alcoholism, hide their family's pain from others, and sacrifice their personal space and needs for others.

Therefore, the codependence of alcohol is not only a medical problem, but also a problem in social fields such as sociology and psychology. Although the codependence of alcohol has been studied in many countries in the world, due to the scarcity of related academic and research work in our country, it was considered that there is a need and demand for research on "psychological and behavioral changes of the wife of a man who is dependent on alcohol."

Benefits of Research

Based on the study of the psychological and behavioral changes of a person who is addicted to alcohol, this research is beneficial to develop recommendations for social and psychological care during alcohol addiction and prevention of alcohol addiction.

State of Research

Researchers from Harran University in Turkey, Kaplan et al., have conducted an interesting study on the social problem of codependence. According to the researchers, "Housewives have been playing the role of caretakers in all kinds of societies and families, but in some cases, housewives face serious

psychological problems within this role of caretaker." 371 housewives participated in this study. Dependence Assessment Questionnaire (CODAT) was used as the research method and instrument. The average age of the housewives included in the study was 35.19 ± 9.85 , 35.5% of the participants had graduated from university, 13.7% had an unpleasant relationship with their husband, and 51.5% had housework. According to the results of the research, the result of the assessment of dependence is 76.16 ± 17.75 , or it is determined that the housewives' lack of self-confidence and dependence on others increase the symptoms of psychological changes.

Purpose of the study

To study the "codependency to alcohol" of family members and close relatives of men with alcohol addiction, especially psychological and behavioral changes, and develop recommendations for prevention.

Scope of the study

There will be 67 spouses of men with alcohol addiction disorder who receive a psychiatric-narcological care at the hospital. A control group of 33 unrelated individuals was selected.

Research methods

1. Questionnaire aimed at obtaining general research information;
2. The methods and tools for data collection are developed using Alcohol Use Disorder (AUD) specified in the US Diagnostic and Statistical Manual of Mental Disorders (DSM)-V.;
3. The psychological and related-behavioral changes of an alcohol codependent person were collected by closed or semi-open questionnaires using the above methods, and a sample of symptoms was made.
4. Some statistical methods of research and analysis were used as follows:
 - In order to analyze the data, (i) the main study group, 67 members of the family of men with alcohol addiction disorder, and 67 members of close relatives with codependence on alcohol, and (ii) 33 members of the control group (no codependence on alcohol) were selected, and analysis was carried out for each variable (Analysis of Variance-ANOVA) was used.
 - According to the data, the quantity, average value, and standard deviation of each information entered were compared between the study and control groups, and the difference in numerical values and confidence limits were determined.

2. Theoretical research

2.1 Alcoholic codependency is an unhealthy family relationship in which a codependent family member becomes self-sacrificial by focusing on the alcoholic family member. It is a psychological and behavioral crisis that is harmful to both parties involved.

The modern understanding of codependency is due to the fact that it is considered "a unique relationship condition characterized by excessive psychological, social, and physical dependence on others." A major consequence of codependency is the inability to care for others and the inability to care for oneself. This greatly hinders personal development. Some researchers believe that codependency is a psychological concept in which a person is overly dependent on a loved one throughout life and is responsible for their feelings and actions. Researchers have identified common characteristics of codependence as including the following (Joaquin Selva Bc. S, 2018). It includes:

- Low self-assessment;
- Unhealthy family relationships;
- Depression;
- Anxiety;
- Stress;
- Low expression of emotions;
- Inability to say no;
- Has a sense of compulsion to care for people;

- In particular, the desire to control others;
- Difficulty in honest communication;
- Try to please everyone;
- Ignore your own needs, thoughts and feelings;
- Predominance of love and compassion;
- Fear of being alone, etc.

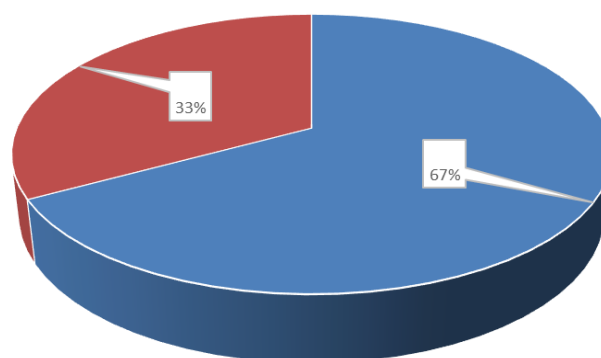
2.2 Alcohol-codependent women have a sense of excessive responsibility for the actions of others and tend to be offended when their efforts are not recognized. Unhealthy interpersonal relationships or dependency is manifested by the following syndromes. These include: codependent family members, especially the wife, who (i) acquiesce to whatever the alcoholic loved one wants, (ii) will do anything for him, (iii) want to control others in addition to blaming himself, (iv) lack of trust in oneself and others, (v) fear of being alone, (vi) lying and being unfair. Families of patients with alcoholism try to adjust their lives accordingly. The alcoholic denies or pretends to be unaware of the member's regular alcohol consumption. An alcoholic's family lives in a way that surrounds him. In general, researchers such as American psychologist Dr. Vara Saripalli (Dr. Vara Saripalli is a licensed psychologist in Chicago) have noted that someone who is addicted to alcohol neglects his own needs (Vara Sripally, 2021).

2.3 A total of 100 women aged 32-58, 67 with codependence on alcohol and 33 without codependence on alcohol, were included in the study (Table 1). The main group of the study, group 1, consisted of 67 people who had a family member or someone close to them who had an alcohol addiction disorder or a bad drinking habit. The control group, or group 2, consisted of 33 participants who did not have a family member or close relative without alcoholism or harmful drinking habits.

Table 1 Numerical information of the Main and control group

No	Main and control group	Group-1 Main group	Group-2 Control group	Total
1	Someone in the family has alcohol dependence/alcoholism	67	0	67
2	None in the family has alcohol dependence/alcoholism	0	33	33
	Total number	67	33	100

Figure 1. Whether a family member or someone close to the respondents consumes alcoholic beverages



Anxiety

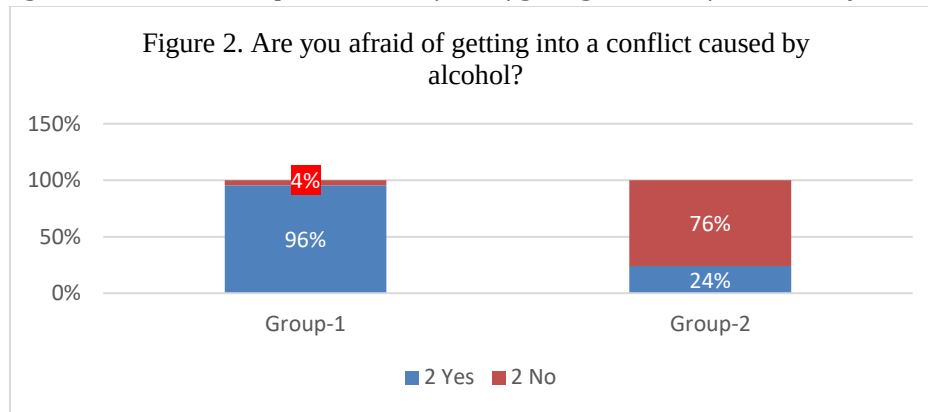
96% of the women in the main group of the study on alcohol addiction said that they are afraid of having a drunken family member (usually a husband) who has an "alcohol addiction" and 4% are not afraid. 24% of women in the non-drinking and control group were afraid of fighting because of alcohol, and 76% were not afraid.

According to the comparison results of the main and control groups of the study, there is a high probability (OR=6.0) of developing fear of alcoholism, its symptoms and consequences in women with alcohol codependence.

Table 2 Anxiety of conflicts caused by alcohol

Response	Group-1		Group-2		OR	P
Yes, I am afraid.	64	96%	8	24%	6.0	0.00005
No, I am not afraid.	3	4%	25	76%		

Figure 2. Whether the respondents are afraid of getting into a conflict caused by alcohol



Conclusion

The following conclusions are drawn from the research results. It includes:

- ✓ The research group included 67 women aged 32-58 who had a family member with alcohol addiction or alcohol codependency.
 - ✓ The control group consisted of 33 women of the same age who did not have a codependence on alcohol and did not have anyone in the family with alcohol addiction.
 - ✓ 95.52% of women in the research group who are afraid of conflicts due to alcoholism,
 - ✓ The proportion of women who sacrifice themselves and care more for someone who regularly drinks alcohol is 82.09%,
 - ✓ 74.63% of women who were subjected to verbal abuse and violence
 - ✓ 71.64% of women who paid debts and payments on behalf of someone close to them (usually their husband) who consumes too much alcohol,
 - ✓ 65.67% share of people who are embarrassed to tell someone close to them that they drink alcohol.
 - ✓ 100% of women who are hurt by someone close to them who is addicted to alcohol
 - ✓ 95.52% of women who get angry and upset
 - ✓ 46.27% of women who try to prove their well-being to others,
 - ✓ Percentage of lonely women 53.73%
 - ✓ The proportion of women who were depressed and depressed in their lives was 74.63%, respectively.
- The results of the above data research show that wives or women who are members of a family with codependence on alcohol experience fear, anxiety, complaints, depression, depression in their own lives,

anger, loneliness, powerlessness, discouragement, shame, falling into debt, and violence. It shows that psychological problems arise, such as trying to appear as a victim and not having any problems because of being exposed, or on the contrary, because the reputation of the family members is affected.

References

1. Rusnakova, M. (2014). Codependency of the Members of a Family of an Alcohol Addict. *Social and Behavioral Sciences*, 132, pp.650-653
2. Эрдэнэбаяр, Л. (2016). *Донтолтын анагаах ухаан*. 56.14 Э 73, Улаанбаатар хот: Сэлэнгэ хэвлэх үйлдвэр.
3. NIAAA, 2. (2021). *Alcohol Use Disorder: A Comparison Between DSM–IV and DSM–5*, <https://www.niaaa.nih.gov> • 301.443.3860. National Institute on Alcohol Abuse and Alcoholism: <https://www.niaaa.nih.gov/sites/default/files/DSMfact.pdf>
4. Daniel J Frasca DO, F. (2022 Nov). A Codependency Mindset in Medicine: Etiology, Manifestations, and Ways Ahead. *Fam Pract Manag*. doi:PMID: 36378595
5. Haroutunian, H. L. (2022). *Codependency*. Dr. Harry: <https://drharrybeingsober.com/what-we-treat/codependency/>
6. Kaplan, V. (2022). *Mental Health States of Housewives: an evaluation in terms of self-perception and codependency*. *Int J Mental Health Addict*. doi:PMID: 36091486 PMCID: PMC9447951 DOI: 10.1007/s11469-022-00910-1

SSSED-11

Improving Students' Listening Skills through TED

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Abstract: In recent years, using Ted talks for academic listening in EAP contexts has gained popularity, and authentic material in the English as a Foreign Language (EFL) classroom, especially in listening, encourages students to apply actual language or authentic speech. This article presents to examine the impacts of this online resource on Mongolian EFL students' listening skills. In order to improve students' listening comprehension skills, a test was taken after 6 experimental lessons. According to the evaluation of the students, the activeness of the less active student who got insufficient grades and the motivation to learn English increased. Also, according to the results of level setting and observational research, students' listening comprehension was at a low level. During the experimental lesson, it was observed that the students could easily find the words and sentences they had heard before. Therefore, it is concluded that conducting classes using TED Talks frequency is the most effective in developing listening skills, pronunciation, and vocabulary. Overall, the results showed that using TED Talks was more advantageous for listening development than using CDs of the course textbook and other media. The implications of this study can encourage EFL teachers to integrate TED Talks into their English classes.

Keywords: listening skills, listening comprehension exercises, TED talks, listening frequency, Mongolian students

1. Introduction

In this digital era, technology plays a profound role for all teachers and students around the world. A variety of methods may be achieved via the use of this tool. In the case of students, instructors, and parents, free internet resources, educational materials, and other chances for effective learning may be quite beneficial. Effective communication is an essential skill for success in all aspects of life, and listening plays a crucial role in communication. Listening is a crucial aspect of effective communication and it plays a vital role in academic success. Without proper listening skills, students may struggle to comprehend instructions from teachers or participate in discussions with peers. Therefore, this study is to investigate the impact of TED talks on listening skills among university students. With a deeper understanding of this connection between TED talks and listening skills, we can create efficient interventions for university students. Previous studies suggest that TED talks have a positive influence on students' listening skills. [1] One of the most important tasks for a skilled teacher nowadays is to be able to combine technology, creativity, and unique subject in the classroom.

According to Tryanti Abdulrahman [2] he examined improving students' newly acquired academic vocabulary and how TED Talks affect university learners' listening comprehension. Also, it finds learners' attitudes through using the TED talks in the classroom. The results of the study suggest that TED Talks are a valuable resource for teaching listening skills to college-level EFL students. [3]

In recent years, the utilization of TED talks in English for Academic Purposes (EAP) has become increasingly popular. These talks are being promoted as useful tool in coursebooks for enhancing both listening comprehension and critical thinking skills. Despite the popularity of using TED talks in EAP instruction, a traditional approach to teaching listening, which emphasizes the testing of lower-order thinking skills through discrete questions, may not be sufficient in promoting critical thinking skills among second language learners. Such an approach may not fully equip students with the necessary skills to engage in a critical examination of broader issues. [1]

The main focus of this thesis is to examine the impact of metacognitive strategy training on ESL learners' self-directed use of TED Talk videos for listening practice. The study seeks to explore how providing learners with training in metacognitive strategies influences their ability to independently utilize TED Talk videos to improve their listening skills in English as a second language. The results of the study show that following the metacognitive strategy training session, learners demonstrated an improved ability to use TED Talk videos as a means of enhancing their comprehension of listening texts. In addition, the training appeared to heighten learners' metacognitive awareness, enabling them to better understand how to use self-directed learning strategies to improve their listening skills. Feedback from learners indicated that the metacognitive strategy training session was helpful in increasing their comprehension and promoting their ability to learn autonomously. The implications of this study suggest that there is a need to equip second language learners with the necessary skills, tools, and strategies to enable them to learn a language outside of the classroom context. The findings highlight the importance of metacognitive strategy training in helping learners to become more self-directed and independent in their language learning. Therefore, it is important for language teachers to integrate metacognitive strategies into their teaching practices, as this may help learners to develop the skills necessary to continue learning a language beyond the classroom setting. [4]

The research sample comprised 100 students, with 50 students majoring in Agrarian Engineering and 50 students majoring in Electrical Engineering and Energy. All of the participants were enrolled in the mandatory English for Specific Purposes (ESP) subject. The participants were divided into two groups: the experimental group and the control group. At the beginning of the semester, both groups took a pre-test to assess their initial level of English proficiency. Following the semester, a post-test was administered to evaluate the impact of using TED Talks on the students' learning outcomes and potential benefits. The results of the experiment indicated that both the experimental and control groups demonstrated improvement in their language skills after using TED Talks. However, statistical analysis revealed that the experimental group exhibited significantly better outcomes in both listening comprehension and speaking skills as compared to the control group. Questionnaires were distributed among the students, comprising 5 questions aimed at eliciting their personal opinions regarding the e-learning process and the influence of TED Talks on their listening and speaking skills. The data gathered through the questionnaires was used to evaluate the impact of TED Talks on the student's language learning outcomes. The feedback obtained from the questionnaires revealed that the majority of students held a positive attitude towards incorporating TED Talks into the language learning process, particularly among those who were part of the experimental group. [5]

The website [ted.com](https://www.ted.com) is a platform that hosts talks with the aim of "spreading ideas" on a wide range of topics. According to the information provided on the website, TED.com is a platform of TED, a non-profit organization that originated from the 1984 Technology, Entertainment, and Design Conference. The organization is dedicated to promoting the spread of ideas and knowledge through its talks, conferences, and initiatives. TED aims to encourage people to reflect on a wide range of topics, including but not limited to medical issues, psychology, environmental protection, and the economy. Through its talks and events, TED seeks to inspire and spread ideas that can lead to positive change in society. Among the various activities organized by TED, we will focus on two of them: TED Talks, which are

available on the ted.com website, and Ted-Ed lessons, which can be accessed on ed.ted.com. Both of these platforms aim to disseminate knowledge and ideas on a broad range of topics through engaging and informative content. Although TED Talks and Ted-Ed lessons are not specifically designed as didactic materials, they can be effectively used in the English classroom, particularly in the current context of online teaching due to the coronavirus pandemic. The availability of these resources on digital platforms has made it easier for teachers to incorporate them into their lesson plans and use them as a means of enhancing their students' language skills, critical thinking abilities, and general knowledge.

This article focuses on a study that was conducted to investigate the role and impact of TED Talks with subtitles in the foreign language classroom. The study aimed to explore the effectiveness of using TED Talks as a tool for language learning and to determine the extent to which subtitles can aid in the comprehension and acquisition of a foreign language. According to the survey results, TED Talks have a significant impact on listening skills in the foreign language classroom. The authors of the study conducted their research in a school located in the Almaty region, with the aim of investigating the potential of TED Talks as a language learning tool and assessing their impact on students' listening skills. [6]

This work examines the implementation of TED Talks as part of ESP (English for Specific Purposes) blended learning training, with the aim of improving students' listening comprehension skills. The study investigates the effectiveness of incorporating TED Talks into the language learning process and assesses the impact of this approach on the development of students listening skills. This study presents a case analysis of 12 non-linguistic students with lower proficiency levels. The students were given a designated TED Talk to listen to each week and were asked to perform listening comprehension tasks, which were later checked in the classroom. The study aimed to evaluate the impact of using TED Talks as a tool for improving students' listening comprehension skills, particularly for those with lower proficiency levels. TED lectures were integrated into an academic and specific English course for undergraduate students of the Ecological faculty with the purpose of promoting learner autonomy, enriching academic vocabulary, developing listening comprehension skills, and promoting scholarly journal writing over the long term. The aim of the study was to assess the effectiveness of TED Talks as a tool for improving students' academic and language skills in a specific academic context. The study's results were formally evaluated through pre-tests and post-tests, as well as through individual anonymous surveys of the students upon completion of the course. This allowed for both quantitative and qualitative data to be collected and analyzed to determine the effectiveness of the TED Talks in achieving the course's goals. After analyzing the survey results, we evaluated the advantages and disadvantages of implementing TED talks into the ESP curriculum. This provided a comprehensive understanding of the students' perspectives on the use of TED talks and helped identify areas of improvement for future use. [7]

TED (Technology, Entertainment, and Design) Talks are an excellent resource for promoting students' learning autonomy and enhancing their English listening skills. These talks are typically delivered by experts in various fields and cover a wide range of topics, making them an excellent source of information for students. The mixed-method approach used in this research is an excellent way to obtain a comprehensive understanding of the effectiveness of TED Talks in promoting learning autonomy and enhancing English listening skills in ESL students. The questionnaires may have been used to gather qualitative data on the students' perceptions of the use of TED-Talk in promoting learning autonomy and enhancing listening skills. The questionnaires may have included open-ended or closed-ended questions and may have been administered before and/or after the intervention. The results of the study indicate that the use of TED-Talk in the English for Business course is associated with an increase in students' learning autonomy in several areas, including learner control, critical reflection, motivation, and information literacy. the study found that the use of TED-Talk was associated with a slight increase

in students' listening scores, which suggests that the intervention had a positive impact on their listening skills. The positive results of the study may encourage EFL/ESL teachers to continue using TED Talks as additional learning material in listening classes. The study's findings suggest that the use of TED Talks is an effective way to promote students' learning autonomy and enhance their listening skills, which may lead to improved language learning outcomes. The consistency of students' autonomy in learning may lead to significant improvements in their comprehension level. The study's findings suggest that the use of TED Talks can promote students' learning autonomy, which includes learner control, critical reflection, motivation, and information literacy. [8]

The researchers inferred that the observed difference in the students' listening scores was due to using TED talks via mobile devices in the study. the researchers could also conclude that TED talks are useful sources for practicing listening skills. The study found that students listening scores improved slightly after using TED Talks as a supplementary resource in their English for Business course. The study found an increase in students' learning autonomy and positive perceptions towards the use of TED Talks suggesting that self-directed learning via mobile devices can be effective in promoting language learning outside of the traditional classroom setting. [9] The main objective of this study was to help the 3rd year students at the Mongolian National University of Education improve their competencies in listening in the target language for academic purposes. Research methods were document research (reading, analysis, benchmarking), processing, and summarizing through observing, planning, doing experiment lessons as well as making reflections and questionnaires. The research hypothesis is Using TED Talks as a form of media can not only improve students' listening skills but also increase their interest in listening exercises.

2. Survey Research

TED is a non-profit organization formed by the Sapling Foundation in 1984 as a conference. The use of ICT in education has become increasingly common in recent years and has brought many benefits, including increased access to educational resources, improved communication between teachers and students, and the development of new teaching and learning approaches. With the increasing availability and affordability of technology, many educators have integrated technology into their classrooms to enhance teaching and learning. From interactive whiteboards to online learning platforms, technology has transformed the traditional classroom into a more dynamic and engaging learning environment. Additionally, technology has enabled educators to reach a wider audience and provide access to education for learners who may not have had the opportunity otherwise. Many teachers use online references such as websites, educational apps, and online tools to enhance their teaching and to provide students with a more interactive and engaging learning experience. There are many free websites available for English language teachers to access authentic materials such as videos, podcasts, news articles, and more, which they can use to create engaging and effective lessons for their students. Some popular websites include TED Talks, BBC Learning English, Voice of America, and many others. These websites offer a range of materials that can be used to teach different language skills, such as listening, speaking, reading, and writing.

Technology has been widely used in various fields, including education, to enhance and facilitate the learning process. With the advancement of technology, new teaching and learning methods have emerged, such as e-learning, blended learning, and flipped classrooms, among others. These methods use technology to provide learners with access to educational resources anytime and anywhere, making education more accessible and convenient. Media, in all its forms, including social media, TV, movies, podcasts, and newspapers, use language as their primary means of communication. Media has a significant impact on language learning and can help learners improve their language skills by exposing

them to a wide range of authentic materials. For instance, TED Talks, as a form of media, provide students with opportunities to practice their listening and comprehension skills while also exposing them to a range of different accents, vocabulary, and topics. [8]

TED Talks are a form of media that consists of online presentations by experts in various fields on a wide range of topics. The talks are usually delivered by native speakers and are available for online or offline viewing on a variety of platforms, including laptops and mobile devices. Watching TED Talks can be a great way to improve listening comprehension while also gaining knowledge on various topics. The videos feature native speakers and cover a wide range of topics, allowing learners to choose content that interests them and helps them to learn vocabulary and language structures in context. Additionally, TED Talks often include subtitles, which can assist with comprehension and also help learners to pick up new words and phrases. [10]

Using YouTube videos can be a valuable tool to improve students' listening skills. The tube can provide a wealth of authentic listening materials for language learners. With its vast collection of videos on a wide range of topics, learners can choose videos that match their interests and skill levels. Additionally, YouTube offers various features that can support language learning, such as subtitles, playback speed control, and the ability to replay a section of the video. By using YouTube videos in language learning, students can improve their listening skills while also expanding their knowledge on various topics. Encouraging student motivation is an essential aspect of effective teaching.

3. Methods

The students were assessed by a placement test and an observational survey, and when processing the results, the students' listening ability was evaluated as poor or weak, but according to the observational survey, 62% of the students rated their listening ability as average, 18% as good, 16% as insufficient, and the remaining 4% as good enough. It is concluded that there is a difference in reality. In our department, 24 students participated in the exam. Among them, there are no students with grades A, B, or C, and all of them received unsatisfactory grades (A-0, B-0, C-0, D-0, F-24). It is also commendable that students are doing something to improve their listening skills. However, it is necessary to improve students' listening skills as one of the basic skills that must be mastered.

4. Results, Data Analysis /

4.1 Surveillance study:

An observational study on improving students' listening skills using TED talks. In order to find out the possibility of using TED talks to improve students' listening ability in English, a survey was conducted on 24 students of the 3rd year grade students of the MNUE-SSSH-EL. Student observation questionnaire and results: 1) How would you rate your English listening skills? A. Good enough - 4%; B. Good - 18%; C. Moderate - 62%; D. Inadequate - 16%; E. Bad - 0% and 62% of the students rated their listening ability as moderate, 18% as good, 16% as insufficient, and the remaining 4% as good enough. 2) Have you ever heard of TED talks before? A. Yes - 66%; B. No - 34% and most of the students 66% of them answered that they had heard about TED talks before. 3) Do you think that watching TED talks in English can improve your listening skills? A. Yes - 100%; B. No - 0% 100% of the students who participated in the study, or all of them, believed that watching TED talks in English is effective in improving their listening skills. 4) What do you do on your own to improve your English listening skills? A. Watching movies - 25%; B. Listens to conversations - 16%; C. Listens to music - 34%; D. Other-25% (This includes TV shows and podcasts and blogs in English) This survey found that 34% of students listen to music to improve their listening skills, while the rest watch

conversations and movies. 5) What is the most difficult skill for you to learn English? A. Reading - 8%; B. Speaking - 21%; C. Listening - 42%; D. Writing-29%. Most of the students who participated in the survey 42% said that listening is the most difficult skill to learn English, while 29% said that it was writing, 21% were speaking, and the remaining 8% were reading.

Processing of the results of surveillance and placement tests: When processing the results of the placement test, the students' listening ability was evaluated as poor or weak, but the reality is that 62 percent of the students rated their listening ability as average, 18 percent as good, 16 percent as insufficient, and the remaining 4 percent as good enough. It can be seen that there is a discrepancy. It is also commendable that students are doing something to improve their listening skills. However, it is necessary to improve students' listening ability as one of the basic skills that must be mastered.

4.2 Process and results of the experimental lesson on improving listening skills with TED talks

The objectives of the lesson were to explore and test opportunities to improve students' listening skills using TED talks.

Duration: 80 minutes of lessons taught in a week Methodology: Observation, benchmarking, comparison, synthesis, analysis, reflection

Trial course: When teaching the experimental lesson, exercises were developed that corresponded to the student's language level, interests, and cognitive abilities. As students watch and listen to the animation TED talks, they do a combination of group and individual activities to fill in the missing words, identify right and wrong, answer questions, and discuss what the speech is about.

General criteria for course evaluation:

It is important for a teacher to properly evaluate the lessons he/she teaches to continuously develop his/her knowledge and improve his/her teaching methods. Also, the teacher has the advantage of improving the quality and results of teaching by giving evaluations and conclusions to the lesson by doing self-evaluation. The teacher can evaluate the lesson according to the following criteria. 1) Whether the content is suitable for the student's language level and needs - (5-5); 2) Whether the processing of exercises was optimal - (10-7); 3) Was the performance of the students' exercises correct - (10-8)

Types of exercises: Fill in the missing word, match the word with the correct sentence, identify right and wrong, answer the question, and choose the correct answer; Formative test 1 (formative test); After the pilot lesson, the progress test was taken with a little difficulty. The test has 1 exercise and this test is graded as follows. Whether the students were able to fill in the words by listening correctly - 16 points; (by converting to 100%) A total of 24 students were tested. A-0,B-0,C-2,D-4,F-18; Success - 0%, Quality - 25%. After 4 experimental lessons, the students were tested on their progress and it can be seen from the above results that they are improving little by little. The students performed the listening task without difficulty because it was the same as the exercise task they had done before. As a result, it is important to make the students' listening process more frequent. Research has shown that the use of TED talks in the listening process can improve students' pronunciation, increase their motivation to learn English, and increase their vocabulary.

5. Discussion, Conclusion

Listening is one of the four essential skills in learning a foreign language. Therefore, mastering this skill is pivotal. It is observed that students study English for many years in secondary school, but their listening ability is not sufficient, and it is necessary to pay attention to the development of this ability.

In this research, we studied the concepts of English listening skills, the importance of TED talks as well as using TED talks and related exercises to improve English language learners' listening skills were developed and used in the lessons and the results were presented.

In order to develop students' listening comprehension skills, there were four lessons and one progress test. According to the evaluation of the students, the less active students who got unsatisfactory grades had an increase in their participation in class and their motivation to learn English. Also, according to the results of level setting and observational research, students' listening comprehension was at a low level.

During the experimental lesson, it was observed that the students could easily find the words and sentences they had heard before. Therefore, it is concluded that conducting lessons using TED talks in a frequent manner is the most effective in improving listening skills, pronunciation, and vocabulary.

In the future, teachers should use TED talks in English listening lessons, which has the advantage of attracting students' attention and stimulating them to practice, and our research results show that they can fully develop their listening skills.

REFERENCE

- [1] Brook.J, ""The affordances of YouTube for language learning and teaching"," *Hawaii Pacific University of TESOL Working Paper Series* , vol. 1, pp. 37-56, 2011.
- [2] Idayani.B, Sailun.A, "The effective of TED Talks video towards students speaking ability at English study program of Fkip Uir," *Perspektif pendidikan dan keguruan* , vol. 1, pp. 65-74, 2021.
- [3] Ismailia.M, Bajramia.L , ""The role of video materials in EFL classrooms," *Procedia-Social and Behavioral Sciences*, vol. 232, pp. 502-506, 2016.
- [4] Ghory.S and H.Ghafory, ""The impact of modern technology in the teaching and learning process"," *International Journal of Innovative Research and Scientific Studies*, vol. 4, pp. 168-173, 2021.
- [5] Ludewig.L, ""TED Talks as an emergent genre"," *Comparate Literature and Culture* , vol. 19, p. 1, 2017.
- [6] Medal.A, *Hacking the Valley:An Overview of the Tech Sector*, AuthorHouse, 2014.
- [7] Meyer.S, *Performing and Creating Speeches, Demonstrations, and Collaborative Learning Experiences with Cool New Digital Tools*, The Rosen Publishing Group, 2013.
- [8] Weinschek.S, *100 Things Every Presenter Needs to Know About People*, New Riders , 2012.
- [9] Krashen.S.D, *The Input Hypothesis*, London: Longman , 1989.
- [10] Paulsen.P, ""New era trends and technologies in foreign language learning," *Interactive Multi-media Electronic Journal of Computer -Enhanced Learning* , vol. 6, pp. 36-48, 2001.
- [11] "bmb," *mb*.
- [12] Idayani.B, Sailun.A and, ""The effect of TED Talks video towards students speaking ability at English study program of Fkip Uir"," *Perspektif Pendidikan dan keguruan*, vol. 1, pp. 65-74, 2021.
- [13] Д.Ёндонпэрэнлэй, " Англи хэл суралцагчдын сонсох чадварыг компьютерийн технологи ашиглан сайжруулах нь, Улаанбааар хот : Хүмүүнлэгийн Ухааны Их Сургууль , 2015.
- [14] Gilakjani.A and Ahmadi. M.R., ""A study of factors affecting EFL learners' English listening comprehension and the state-gies for improvement," *Journal of Language Teaching and Research*, Vols. 2,5, pp. 977-988, 2011.

SSSED-12

Linguistic Characteristics of National Mentality

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Abstract: The only specific thing among people is communicating with each other using language, which has different contextual meaning. Human beings might use similar words, phrases and expressions in different contextual situations with different meanings which means one word has the same meaning but understood in different ways depending on the sender's and recipient's culture and other factors. Thus, people might have ability to use different sounds and symbols to contact with other people in different cultures. Yet, it is important that both parties: sender and receiver understand the meaning of these sounds and symbols to communicate. Nevertheless, sometimes, people fail to understand because of the barrier of failing decode meaning of sounds made by themselves. For example, if two people from different cultures, who speak English, converse, they might not understand one another. In this regard, Andrews (1993) said, "One of the most basic reasons human beings bother to communicate with each other is to impart some kind of meaning". Thus, this work is trying to focus on the understanding meaning of words in order to understand others' intentions, mainly, on denotative and connotative meaning.

Key words: *context, definition, understanding, connotative meaning, denotative meaning*

SSSS-13

Research on the Impact of Work Stress on Psychological Health

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Abstract: Last person in the year public most in the section influence is work of the building stress is defined many research done is _ And people own stress and soul right right distinguish and understand because he can't become percent human, home family and work stress_ the problem of misunderstanding significantly comes out . This study aims to conduct a theoretical and methodological study on the effects of work stress on the psychological health of employees of Govi JSC, and to study the relationship of stress for employees. Govi JSC has a total of 451 office employees, and 215 employees were randomly selected for the study. As a result of the research, many factors and parameters of the workplace have an important effect on the psychological stress of the employees of the organization.

Keywords : workplace stress, psychological health, employee stress

1. Introduction

Stress means a "disordered state of mind" and is a normal reaction of the human body when it perceives an unpleasant threat. There are two types of stress : positive and negative. Usually, everyone perceives stress as negative or distress as some form of anxiety, discomfort, or distress. Society's way of life has devalued stress and seen it as normal. This condition may only occur during periods of extreme stress, but prolonged exposure to stress can lead to chronic stress, which is more harmful and has negative physical and psychological effects, leading to further depression. In terms of workplace stress, work load, job change, unplanned unexpected work, economic crisis, cultural expectations, bad relationship with co-workers cause high level of stress, and in stressful times, the normal patterns of employees are lost, healthy daily activities, actions are easily forgotten. In addition to lack of exercise and poor diet, high levels of stress can lead to high blood pressure, weight gain, and an unhealthy lifestyle in general. A 2015 study conducted by Harvard and Stanford Business Schools, titled Workplace Stress and Health Outcomes, confirmed that stress wreaks havoc on our bodies and, in turn, affects our psyches just as quickly. And when stress spills over into employees' personal lives, the negative effects of work stress on psychological health are magnified. According to the American Depression Association, seven out of ten adults believe that workplace stress has a negative impact on their personal relationships, especially between spouses. Due to the lack of understanding of psychological health of employees, work-related stress damages the psychological stability of employees, so it is necessary to make employees understand the importance of knowledge and information in this area, to improve psychological competence, and to have a clear human resource policy for the organization. And when the stress of work starts to spill over into people's personal lives, it can have an even more negative impact on people's psychological health. That's why this issue is emphasized and how workplace stress affects the psychological health of an individual study.

2. Survey Research on Stress

The term "stress" as it is currently used was defined by Hans Selye in 1936 as "an abnormal response of the body to any demand for change". Selye noted in numerous experiments that laboratory animals exposed to acute but different noxious physical and emotional stimuli (flashing lights, deafening sounds, extreme heat or cold, constant frustration) all showed similar pathological changes. He later showed that chronic stress can cause a variety of diseases in these animals that resemble those seen in humans, including heart attacks, strokes, kidney disease, and rheumatoid arthritis. For many people, stress is a response to chest pain, heartburn, headaches, and palpitations.

Table 1 - Studies of stress research

Year	Researcher	Research work	Research work button explanation
2018	Kumi Hirokawa	An Examination of the Effects of Stress Management Training for Japanese College Students of Social Sciences Work	This one by research a lot in schools for stress management program is their of stress about perception and stress overcome go through in strategy how influence have whether or not studied.
2018	Cheng Kai-Wen	A study of stress sources among college students in Taiwan	This one by research Taiwan a lot top of schools of students for stressful river important force things studied and those problems the body meat real , home family , school , relationship association and friendship and social force in items help help partition take studied is _ And student and school etc two to the parties for recommendations By processing preferred with sides research is _
2017	Chambel MJ, Curral L	Stress in academic life: work characteristics as predictors of student well-being and performance	Stress and soul idea situation is student in performance affects whether or not in this research study Portuguese of students sample or from 825 people research to get soul science pressure and fear anxiety , examination amount , much school life in soul satisfaction degree is student work in performance very a lot affects said in conclusion reached is _

Psychological health refers to the state of well-being that enables an individual to realize his or her own abilities, cope with the normal stresses of life, work productively, and contribute to society. Psychological health includes our emotional, psychological, and social well-being, which affects how we think, feel, and act, and helps determine how we cope with stress, interact with others, and make choices. Mental health is important at all stages of life, from childhood and adolescence to adulthood. In one example, on July 7, 2020, Lenny Mendonca, former chief economic and business adviser to California Governor Gavin Newsom, publicly revealed why he abruptly resigned from his position on April 10, citing depression. there is Three weeks before his resignation, he suffered a severe depression and was hospitalized in Mendonca. But working in a highly responsible position amid the COVID-19 crisis, "we have to work 120 percent. That means working 80 hours a week and hardly sleeping." Reflecting on her diagnosis and months of recovery, she wrote: "Having a mental health problem shows that I'm still human."

And according to the Substance Abuse and Mental Health Services Administration (SAMHSA), one in four Americans has been diagnosed with a mental or substance use disorder. The National Center for Health Statistics notes that the suicide rate increased by about 35 percent between 1999 and 2018, and by about 2 percent each year since 2006. Suicide is now the tenth leading cause of death in the United States. Depression increases the risk of suicide - about 60% of people who die by suicide have

depression. According to a 2018 report by the Institute on Health Expenditure, per capita mental health spending rose 33 percent between 2014 and 2018, and in December 2020

The relationship between work stress and psychology.

When stress is excessive and prolonged, there is a risk of mental health problems and health problems. Long-term stress increases the risk of psychological health problems such as anxiety, depression, substance use problems, sleep problems, and physical complaints such as pain and muscle tension. Workplace stress can negatively affect workers' psychological health, increasing the risk of anxiety, burnout, depression, and substance use disorders. Employees who are stressed at work are more likely to engage in unhealthy behaviors such as smoking, alcohol and drug abuse, and poor diet.

Workplace depression

In England, psychological problems in the workplace cost the economy an average of £70 billion a year. Currently, it is estimated that 91 million work days are lost due to mental illness. This number clearly shows us how many people suffer from psychological problems and how it affects and hinders their daily lives. It's a win-win situation for both parties. Lose- Lose. But at the same time, there is good news: the World Health Organization estimates that every \$1 spent on mental health treatment and rehabilitation returns \$4 in benefits to people's health and productivity. Another estimate shows that every £1 invested in mental health training by an organization's management can return up to £10 in return. For companies, training, counseling, and treatment aimed at improving psychological health are necessary measures. This is beneficial for both the individual and the organization. In fact, organizations cannot be imagined without workforce. Therefore, paying attention to the health of everyone who becomes a workforce is the first priority of employers, and the above figures show us how much human resource and economic loss the organization can suffer if the open problem is neglected.- /I/O Psychologists/. Stress, work stress and psychological health are studied, and these are the issues that are most closely around us in our lives. Mongolian people work and live in very stressful conditions, and because of this, they do not often notice that they are developing some kind of psychological disorder. Also, mental health is not considered very important. Because of this, psychological disorders can worsen and even require treatment, so it is necessary to detect any problem early or take preventive measures. It is also important for the organization to pay close attention to the health of the employees and improve the work load, schedule, internal atmosphere, salary and incentives, etc. In addition, psychological health refers to the state of well-being that enables an individual to realize his or her own abilities, cope with the normal stresses of life, work productively, and contribute to society. Psychological health includes our emotional, psychological, and social well-being, which affects how we think, feel, and act, and helps determine how we cope with stress, interact with others, and make choices. Psychological health is important at all stages of life, from childhood and adolescence to adulthood. In England, psychological problems in the workplace cost the economy an average of £70 billion a year. Currently, it is estimated that 91 million work days are lost due to mental illness. This number clearly shows us how many people suffer from psychological problems and how it affects and hinders their daily lives. It's a win-win situation, but there's also good news: the World Health Organization estimates that every \$1 spent on mental health treatment and rehabilitation returns \$4 in health and productivity benefits. showed that. Another estimate shows that every £1 invested by management in mental health training can return up to £10 in returns. is For companies, training, counseling, and treatment aimed at improving psychological health are necessary measures. This is beneficial for both the individual and the organization. In fact, organizations cannot be imagined without workforce. Therefore, paying attention to the health of everyone who becomes a workforce is the first priority of employers, and the above figures show us how much human resource and economic loss the

organization can suffer if the open problem is neglected.- /I / O Psychologists/ Although there are studies that describe workplace stress in the Mongolian context, there are no studies on the effects of workplace stress on psychological health

1. Employee stress research - M. Oyun-Undram / 2020 /

considered some of the sources of stress that affect all employees of the organization more or less . Most of the employees who participated in the survey answered that the main reason for stress was dissatisfaction with wages and incentives. Because many things in the employee's family and life are directly dependent on his salary. Also, most people have considered the workload. It's a question of whether the salary, working hours and workload are equal or not. These stressors affect organizational behavior to a greater or lesser extent. It is clear that psychological and physiological fatigue affects the behavior of employees. Therefore, in order to reduce stress in the organization , it is necessary to take measures to reduce or even eliminate the cause and source of stress . It also shows that mental illness has the highest percentage is

2. Study of factors influencing work stress - U. Anudary / 2021 year/

In this study, when determining work stress, it was measured by the level of influence of factors that can cause stress, and a total of 7 groups identified factors from 39 indicators. According to the results of the analysis, 7 factors could be measured with 25 indicators, and the reliability of the 25 indicators for measuring the 7 identified factors was rated as 0.7 or higher. Therefore, according to the results of the research, the factors that most affect the stress of the employees of the organization are high work demands, low work support, work culture, work productivity, management and incentives, and salaries. Therefore, the results of the research confirm that the employees of the service department of Orgil Encanto branch are under a lot of stress due to the above factors and their productivity decreases.

3. The effect of employee discrimination on job stress and satisfaction - Ts. Erdenezaya / 2019 year/

Discrimination (nepotism, favoritism, cronyism) creates a lot of stress in the workplace for employees, and the stress leads to job dissatisfaction, which in turn increases employee turnover. As a result of the study, discrimination is supported by international agreements, but it has not been sufficiently evaluated without the participation of employees of state-owned joint stock companies. This study shows that although employees of state-owned joint-stock companies are generally satisfied with their jobs, they are exposed to workplace discrimination (nepotism, favoritism, and cronyism).

4. Occupational Stress and the Mental and Physical Health of Factory Workers - James S. House /1980/

This one research is work of the building of stress real feature qualities work stress and the body physical and psychological healthy medical force of things association relationship appreciated. Research is and same these seeds results is percent human different situation and conditions of the situation feature quality association dependent whether or not defined. Work stress is mental healthy health show influence evaluated ; wide range potential conditions of the situation variables take seen and blue collar workers concentrated.

5. Consequences of Job Stress for the Mental Health of Teachers - IS Schonfeld , R. Bianchi, P. Luehring -Jones /2017/

Help in research work of the building of stress force of things between of dependence about take seen and psychological healthy medical problem (psych depression feature symptoms, fatigue , psychological disorder etc like of the soul crisis) teacher to happens is _ Teacher Sun day even work under stress

affected and this is psychological healthy health negative effect shows . From research to watch others group with members in comparison teacher Sun psychological pathological level height there is And teacher Sun work of the building in violence exposure risk height there is Work place in the problem overcome go through seeds with of the situation about research loose have and from research to look at fatigue is the body independent feature from quality more soul depression.

In the theoretical research section, stress, work stress and psychological health are studied, which are the issues that are most closely related to our lives. Mongolian people work and live in very stressful conditions, and because of this, they do not often notice that they are developing some kind of psychological disorder. Also, mental health is not considered very important. Because of this, psychological disorders can worsen and even require treatment, so it is necessary to detect any problem early or take preventive measures. It is also important for the organization to pay close attention to the health of the employees and improve the work load, schedule, internal atmosphere, salary and incentives, etc.

3. Research methodology and sampling

Govi JSC operating in Ulaanbaatar has a total of 451 office employees. The survey data yielded a suitable sample size of 208 employees to collect data with 5% margin of error and 95% confidence level, and a total of 215 employees completed the survey. The appropriate sample size was determined using the Roasoft.com Sample size calculator will be This survey has 15 questions about work stress and psychological health, and 5 questions about personal information, or a total of 20 questions. When developing the questionnaire, 6 factors were taken out, "Occupational stress and psychological and physical health of factory workers - James S. House /1980/" and Employee Stress Research - M. Oyuun-Undram /2020/, and prepared the questionnaire in the form of a sample reading of many other research studies. The survey will be taken in the form of a questionnaire, and after completing the survey in the form, it will be analyzed in the SPSS program. The questionnaire survey has the following 3 parts. It includes:

First Section : Work qualified related stress

Second Section : Psychological healthy greetings determine part d

Section Three: Personal Information

4. esults, Data Analysis

Question		Frequency	Percentage
Sex	Male	95	44.2
	Woman	120	55.8
Age	21-25	86	40.0
	26-30	53	24.7
	31-35	39	18.1
	36-40	16	7.4
	41-45	17	7.9
	46-50	1	.5
	More than 50	3	1.4
home family situation	Single the body	102	47.4
	Married	72	33.5
	Household headed	25	11.6
	Collaborative lives	16	7.4

In the company worked year	3 months up to	28	13.0
	1 year up to	67	31.2
	2-3 years	53	24.7
	4-5 years	37	17.2
	6-9 years	11	5.1
	10 and from him up year	18	8.4
Alban command	Manage employee	35	16.3
	Basic employee	126	58.6
	Help employee	29	13.5
	Time S and contracted employee	25	11.6

The following force from things which is you the most a lot stressful?

feeling	Average meaning	
	Cluster 1	Cluster 2
Work load	2.782	3.4805
Work feature quality	2.8333	3.2208
Dealing with management relationship	2.8768	2.9091
Salary enough	3.1522	3.5065
Work above together crowd anger breath	2.9638	2.6623

		Cluster 1		Cluster 2	
Question		Repeat g	Percentage	Repeat mz	Percentage
Stress feature sign	Sick days or work interruption increase	38	10.3 %	20	10.2 %
	Creativity and initiative _ decrease	75	20.3 %	42	21.4 %
	Head pain	80	21.6 %	41	20.9 %
	Pressure increase	35	9.5%	20	10.2 %
	Heart packing	36	9.7%	21	10.7 %
	Composition unstructured to become	43	11.6 %	21	10.7 %
	From others myself isolation	33	8.9%	13	6.6%
	Spread out time to wait	30	8.1%	15	7.7%
	Others			3	1.5%
Psychological healthy hello	Me all thing perfect to do trying	76	23.7 %	49	27.8 %
	Focus on me , decision to release difficult there is	71	22.1 %	30	17.0 %
	Others people me what that think is that is idea suffers	62	19.3 %	36	20.5 %

Me small from things become extreme a lot of the soul in rapture obsessed	70	21.8%	45	25.6%
I am someone's opinion recommendations listen can't	39	12.1%	15	8.5%
Others	3	0.9%	1	0.6%

According to the study, the following factors have the greatest impact on work stress and psychological health, so we prepared the survey questionnaire in the form of a sample. will be Also, most workers have problems with perfectionism, decision-making, and getting overly excited over small things. Cronbach's Alpha, the main coefficient of reliability analysis, takes a value between 0 and 1. In the above results, the value is 0.879, which is very reliable.

5. Conclusion

215 people participated in the survey, and the questionnaire was obtained through a Google form questionnaire. For that organization, 44.2% of all respondents were male and 55.8% were female, and they were mostly aged 21–30. In the sense that the employees are composed of young people, the organization has a great impact on the culture of the new generation is In the study, it was determined that 5 groups of 18 indicators can be factorized in the analysis of the factors evaluated when the reliability analysis of the factors that can cause stress in the study is 0.879 or more. The impact of 5 factors on work stress was statistically significant, and the impact of factors such as "Community, Salary, Workload, Management Relations, and Health" was relatively higher than other factors. Therefore, as a result of the research, the factors that most affect the stress of the employees of the organization are the factors that have the most psychological impact on the colleagues, salary, workload, and management relations. Nowadays, people live and work in stressful situations, and because of this, they often do not realize that they are developing some kind of psychological disorder. Because of this, psychological disorders can worsen and even require treatment, so it is necessary to detect any problems early or take preventive measures. It is also important for the organization to pay close attention to the health of the employees and improve the work load, schedule, internal atmosphere, salary and incentives, etc. Changing the working environment and conditions of employees is a reliable way to deal with stress. This approach directly reduces work stress. First of all, identify the work conditions that cause stress, and then develop a strategy to eliminate or change the stressor. This method also has disadvantages. All workplace stressors cannot be addressed simultaneously. Because the new work environment can create stress for another employee. Therefore, if the above two methods are used in combination, the organization can completely solve the work stress.

References

- Г.Цэрэн (2014), “Байгууллагын зан төлөв”. Улаанбаатар хот.
Б.Батсайхан (2015), “Organizational psychology”. Улаанбаатар хот.
Д.Эрдэнэчулуун (2009). “Удирдлагын сэтгэлзүйн үндэс”. Улаанбаатар хот.
М.Оюун-Ундрэм (2020), “Ажилтны стрессийн судалгаа”.
Min- Hee Hong, J.-ML (2020), “The Relationship between job stress and mental health at work”.
Shin, Y.-C. (2020), “Job Stress and Depression”.
Williams, JP (2020), “Mental health in the workplace, The coming revolution”.
Association., AP (2021), “Mental health”. psychiatry.org ,http://www.psychiatry.org/ -
info.gobi.mn, (2021), <https://info.gobi.mn/report/>-
UD(2021).“The Effects of Job Stress and Mental Health of Care Service Workers. Services”.
Говь ХК, (2022) “Хүн хүчний тайлан”. Улаанбаатар хот.
Mentalhealth.gov (2022), <http://www.mentalhealth.gov/>

SSBA-14

Assessing the Financial Information Quality of Commercial Banks

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Abstract: In Mongolia, the banking sector accounts for the majority of the financial market. In 2021, amendments to the Banking Law added the concept of "bank with influence in the banking system" and Article 4.2 states that "a bank with influence in the banking system shall be a public company, and other banks shall be listed company". In accordance with these amendments, the 5 influential commercial banks defined in the annex to the order of the Governor of the Bank of Mongolia were required to have conducted an initial public offering (IPO) on the financial market before June 30, 2023. Therefore, we aim to evaluate whether the commercial banks that have offered their securities to the public, are preparing to offer and other commercial banks are presenting and disclosing their financial information in accordance with international financial reporting standards qualitative characteristics aimed at meeting the information needs of investors. To measure the quality of financial information, a questionnaire with 5 groups and 19 questions developed by Beest, Braam and Boelens was used, and the information quality index was determined by scaling from 0 to 5 points. In this research, financial reports and annual reports data for 2019-2022 of 12 commercial banks operating in Mongolia as of 2023 are used. In the case of M Bank, the evaluation was based on only one year's financial data because its operation started from February 2022. It is believed that the results of this research are of practical importance to provide concrete support for investors' decision-making, as well as to identify and improve the quality of financial information for commercial banks.

Keywords: banking sector, qualitative characteristics of useful financial information, financial statements, listed company, commercial banks, influential commercial banks, annual reports, financial information quality index

1. INTRODUCTION

Statement of the Problem:

In 2021, amendments to the Banking Law added the concept of "bank with influence in the banking system" and section 4.2 states that "a bank with influence in the banking system shall be a public company, and other banks shall be listed company". (*Банкны тухай хуульд нэмэлт өөрчлөлт оруулах тухай*, 2021). In accordance with this amendment, the Bank of Mongolia Governor's Order A-138 dated April 19, 2021 approved the "Methodology for Identifying Banks with Influence in the Banking System" (*Банкны систем нөлөө бүхий банкныг тогтоох аргачлал*, 2021). This methodology has 3 factors that contains 10 indicators. "Systemically influential banks" have been identified and approved as Khan Bank, Trade and Development Bank, Golomt Bank, State bank and Khas Bank on this order (*Банкны системд нөлөө бүхий банкны жагсаалтыг шинэчлэн батлах тухай*, 2021). In section 3.4 of this methodology states that the bank's influence score is calculated every year, and if the threshold score is exceeded, the list of influential banks will be revised and approved by the order of the president of the Bank of Mongolia.

According to Section 4.2.7 of the Law on Accounting, enterprises and organizations engaged in commercial banking have to comply with "International Financial Reporting Standards". In accordance

with the conceptual framework of IFRS “The objective of general purpose financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders, and creditors (‘primary users’) in making decisions about providing resources to the entity” (IFRS Standards, 2021). In 2016, a joint survey conducted by Mongolian association of security dealers and Spoonmedia Ltd. showed that 43 percent of the respondents did not read the financial statements at all, 32 percent had moderate trust in the financial statements of listed companies, and 25 percent did not trust them. However, despite the fact that 79 percent of investors are interested in receiving financial information, operational and current information of listed companies without delay, 73 percent of them believe that the transparency of information is insufficient. (MASD, 2016)

According to Ninjin's research, the index of presentation of financial statements of companies listed on the Mongolian Stock Exchange, calculated based on the IFRS compliance method, is 24.2 percent, and the index of voluntary presentation, calculated using Botosan's method, is 40.1 percent, and the researcher concluded that the level of voluntary presentation is insufficient. (Ninjin, 2019)

In accordance with the requirements described in the laws, standards and regulations that mentioned above, it is believed that by assessing whether the financial information presented to the public by commercial banks meets the qualitative characteristics of useful financial information of the IFRS, it will contribute to the decision-making of the stakeholders.

Importance of research: We think that it is important for current and potential investors to evaluate and show whether the financial information of commercial banks can be used in their decision-making, for the management of banks to identify points to be considered for improving the quality of financial information presented, and for regulatory agencies to measure the level of implementation of standards and then to support them in identifying the points that need to be considered in order to increase them.

Literature Review:

Paper title	Type of research work Author, year	Method	Result
Evaluating the information quality of financial statements	Doctoral Dissertation Gantulga, 2018	Questionnaire /Beest, Braam, and Boelens/ Modified Jones Model PESTLE+G	Results of the questionnaire, faithful representation score was the highest at 4.1667 and timeliness was above average at 4.1176 while comparability was the lowest at 3.2516. Result of the Modified Jones model, 33.8% of the 77 companies provided good quality reports, and the remaining 66.2% performed profit management to some extent or concluded that it was not good quality. According to the environmental analysis, the economic environment score is 2.11, the socio-cultural environment score is 2.09, and the governance and legal environment score is 1.92, which is consistent with the prior method results.
Financial reporting information quality and its measurement	Research project, 2015	Questionnaire /Beest, Braam, and Boelens/ Modified Jones Model PESTLE+G	For results from collecting and analyzing data from 77 companies listed on the Mongolian stock exchange, the average quality of financial statements is 3.7 points or 74%. Result of the Modified Jones model, 19.5% of the 77 companies provided good quality reports, and the remaining 80.5% performed profit management to some extent or concluded that it was not good quality. According to PESTLE analysis, 51.4% of them were good quality.

			Overall, the average quality of financial statements for the companies listed on the mongolian stock exchange is 48.3%.
Value Relevance of Intangible Assets Recognized in a Business Combination (Juliane & Suliani, 2017, 167- 184)	Pacheco, Juliane ¹ Rover, Suliani Article, 2017	Panel data regression based on Ohlson's model (1995; 2005)	7 years of data from 165 companies listed on the Brazilian stock exchange were analyzed. As for value relevance , it was observed that both the recognized value of the intangible assets and, when segregated in goodwill and in identified intangible assets, were significant and positively related to the market value .

Source: As developed by the researchers

Purpose of the study:

The purpose is to evaluate and give a conclusion on the quality of information in the financial and annual reports made available to the public by commercial banks operating in Mongolia.

Scope:

The research work was prepared based on the audited financial statements and annual reports for 2019-2022 presented to the public by 12 commercial banks operating in the Mongolian banking sector.

Methodology:

A theoretical study was conducted on the methodology of measuring the financial information quality, and according to the methodology of evaluating the quality characteristics of IFRS, the financial and annual reports presented to the public by commercial banks were evaluated by the questionnaire method developed by Beest, Braam, and Boelens, the analysis was processed by SPSS program, and the results were released.

2. Survey Research

2.1. Useful financial information and qualitative characteristics

The main purpose of financial reporting is to provide information users with financial information that is important for making economic decisions (IASB, 2018). The qualitative characteristics of useful financial information are classified as fundamental and enhancing characteristics. In order for financial information to be useful for users' decision-making, it has to meet the fundamental qualitative characteristics of relevance and faithful representation. However, it is stated in the conceptual framework of IFRS that providing the enhancing characteristics: timeliness, comparable and understandable will increase the usefulness of information.

● Relevance

Financial information is considered relevant to consumer decision-making if it has predictive or confirmatory value. Information is considered predictive value if the user is able to use it in decision making. If the user uses the information to test (confirm or disprove) his/her own hypothesis, the information is considered to have confirmatory value.

● Faithful presentation

Fair presentation is an indicator of the quality of information presented in financial statements related

to the true economic situation. Accordingly, the information in the financial statements should be complete, neutral, and free from error. (IASB, 2018)

- **Comparability**

Comparability is a quality element that allows users to identify and understand similarities and differences between items (IASB, 2018). Comparability allows the performance, cash flow, and financial position of an enterprise to be compared over time and with other enterprises, thereby increasing the quality of information.

- **Understandability**

By categorizing, explaining, and presenting information clearly and concisely, the clarity of information is improved. Therefore, users' perception of information will be better and more qualitative. (Cheung et al., 2010)

- **Timeliness**

Timeliness refers to the delivery of information to decision makers within the time frame in which it can influence consumer decisions (IASB, 2018). This quality indicator demonstrates to decision makers that information should be transparent and open before influential information becomes available too late, and the older the information becomes, the less important it becomes.

2.2. Methods for measuring the quality of financial information

In previous studies on evaluating and measuring the quality of financial information, many methods and models have been used to measure the quality of financial statements, and those methods are generally classified as Accrual model, accounting conservatism, and Profit adjustment (discretion accrual) model. (Herath, S. K. & Albarqi, N., 2017)

However, researchers Beest&Braam (2009) and Herath&Albarqi (2017) classified the methods of evaluating and measuring the quality of financial information as Accrual Model, Value relevance Model, Special Elements annual report and Qualitative Characteristics Model. By comparing the methods of measuring the information quality of financial statements according to their categories:

Accrual models examine the level of earnings management as a proxy for earnings quality. Relatively easy to collect data in order to measure earnings management. This method measures financial reporting quality Indirectly. Profit adjustment method measures discretion and nondiscretion accruals and models such as Healy, De Anjelo, Jones, Industry, Modified Jones, and Kotari. There is research work on "Evaluating the information quality of financial statements" (Gantulga G, 2018)" conducted in Mongolian language using this method, while there are many studies conducted in foreign languages in recent years.

The value relevance model is a method that examines how the market price of a company's stock depends on accounting information such as earnings, book value, fair value, intangible assets, and compliance. It is an indirect method that measures the reliability and relevance of financial statements by looking at financial statement information and how it affects stock prices because accounting information affects stock prices. Using this method, researches such as "Governance of Listed company and Market Value Analysis (Bat-Ireedui G, 2015)" and "Determining Factors Affecting Stock Prices on the Mongolian Stock Exchange (Misheel E, 2022)" have been published in domestic. Furthermore, In recent years, there have been a lot of research in foreign countries on the dependence of stock prices on accounting information such as non-current assets, profit, book value and compliance with standards.

The Special Elements annual report is a method that directly measures the quality of financial reporting by determining how a specific indicator presented in the annual report affects the decision-making of

users. It has the disadvantage of not being able to comprehensively express the quality of financial statements because it focuses only on selected elements.

The qualitative characteristics model is a method of directly measuring the quality of financial information by assessing the qualitative characteristics of useful financial information developed by the IFRS Board. By satisfying the qualitative characteristics of financial information, the usefulness of that information for decision-making is improved (Beest, F. et al., 2009). In recent years, many studies have been conducted to measure the quality of financial statements. According to Ninjin's research, the index of presentation of financial statements of companies listed on the Mongolian Stock Exchange, calculated based on the IFRS compliance method, was 24.2 percent, and the index of voluntary presentation, calculated using Botosan's method, was 40.1 percent, and it was concluded that the presentation of companies is still at an insufficient level (Ninjin, 2019). Using the method, the research work "Quality of financial information and its evaluation (Gantulga G, 2018)" and "Quality of financial reporting information and its measurement (Ulziibayar et al., 2015)" and "Interrelationship between the quality of financial reporting and the control function (Odgerel et al., 2021)" have been carried out. These studies were conducted by asking accountants and managers to evaluate the quality of financial information of companies listed on the Mongolian Stock Exchange, and the results showed that the quality of financial statements was relatively high (74%), while the results of the research that was made by their own evaluations based on publicly presented financial statements and annual reports are relatively low or 40%.

The reason for the relatively different results of these studies is that the questionnaire survey of accountants and managers may have included the influence of self-assessing. Importance of this research is to evaluate and show that current and potential investors are able to use financial and annual reports information of commercial banks on their decision-making, so we measured the quality of financial statements by evaluating the information presented to the public on the central bank and commercial banks website.

3. Research Design

3.1. Methodology

In this research, the questionnaire developed by Beest, Braam, & Boelens by fundamental and enhancing characteristics indicating the qualitative characteristics of the IFRS conceptual framework was used to assess the quality of financial information. In doing assessment, the relevance of the financial statements was evaluated by 4 questions, the faithful representation by 5 questions, the understandability by 4 questions, the comparability by 5 questions and timeliness by 1 question, a total of 19 questions and 1-5 points were evaluated.

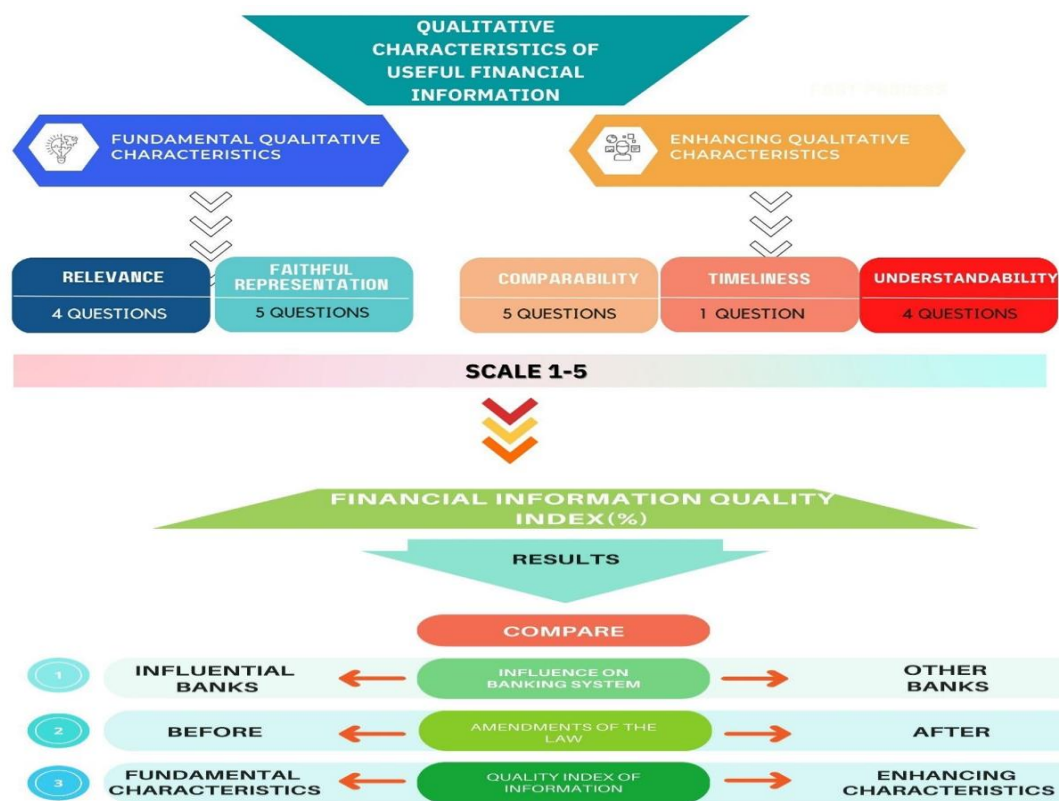
The following research hypotheses are proposed.

H1. Influential banks have a higher financial information quality index

H2. Influential Banks Financial information quality Index has increased since the amendment of the law

H3. The fundamental qualitative index is higher than the enhancing qualitative index

Figure 1. Research design



3.2. Sample

As of April 2023, 12 commercial banks with a banking license were classified as influential banks which were approved by the Governor of Bank of Mongolia order No. A-105 dated April 19, 2021 and other banks. The research sample is shown in Table 2.

Table 2. Classification of sample

№	Банкны нэр	Банкны системдэх нөлөө	Банкны хэлбэр
1	Khan bank	influential	Limited liability company
2	Trade and development bank	influential	Limited liability company
3	Golomt bank	influential	Public company
4	State bank	influential	Public company
5	Xac bank	influential	Limited liability company
6	Trans bank	other	Limited liability company
7	Arig bank	other	Limited liability company
8	Chinggis Khaan bank	other	Limited liability company
9	Capitron bank	other	Limited liability company
10	National investment bank	other	Limited liability company
11	Bogd bank	other	Public company
12	M bank	other	Limited liability company

3.3. Method of data collection

Data was collected using the 2019-2022, 4-year statement of financial position, comprehensive income statement, statement of changes in equity, statement of cash flows, notes of financial statements, annual reports and publicly presented information on the website of the 12 commercial banks included in the research sample.

4. RESULTS, DATA ANALYSIS

4.1. Result

When evaluating the reliability of the survey questionnaire with Cronbach's Alpha coefficient, the result was 0.977 or 97.7 percent, which means that the survey results are reliable. Average indicators were calculated for each of the 19 questions measuring the quality of financial information, and the results are shown in Table 3. The year-end audited financial statements specified in section 38.1 of the law should be published in the first quarter of the following year. The state of meeting the characteristic of timeliness is the highest (94% average), while the state of showing expectations and predictions concerning the future of the company in the annual report is the lowest (20% average).

Table 3. The average value of indicators that determine qualitative characteristics

Question №	Indicator	Mean	Reliability Statistics	
			Cronbach's alpha	N of Items
R1	To what extent does the presence of the forward-looking statement help forming expectations and predictions concerning the future of the company?	20%	.977	19
R2	To what extent does the presence of non-financial information in terms of business opportunities and risks complement the financial information?	34%		
R3	To what extent does the company use fair value instead of historical cost?	54%		
R4	To what extent do the reported results provide feedback to users of the annual report as to how various market events and significant transactions affected the company?	34%		
FP1	To what extent are valid arguments provided to support the decision for certain assumptions and estimates in the annual report?	21%		
FP2	To what extent does the company base its choice for certain accounting principles on valid arguments?	67%		
FP3	To what extent does the company, in the discussion of the annual results, highlight the positive events as well as the negative events?	35%		
FP4	Which type of auditors' report is included in the annual report?	88%		
FP5	To what extent does the company provide information on corporate governance?	46%		
U1	To what extent is the annual report presented in a well organized manner?	48%		
U2	To what extent are the notes to the balance sheet and the income statement sufficiently clear?	72%		
U3	To what extent does the presence of graphs and tables clarifies the presented information?	64%		
U4	To what extent is the use of language and technical jargon in the annual report easy to follow?	68%		
C1	To what extent do the notes to changes in accounting policies explain the implications of the change?	66%		
C2	To what extent do the notes to revisions in accounting estimates and judgements explain the implications of the revision?	64%		
C3	To what extent did the company adjust previous accounting period's figures, for the effect of the implementation of a change in accounting policy or revisions in accounting estimates?	65%		
C4	To what extent is the information in the annual report comparable to information provided by other organizations?	80%		
C5	To what extent does the company presents financial index numbers and ratios in the annual report?	60%		
T1	Are the audited year-end financial statements released to the public within the first quarter of the following year?	94%		

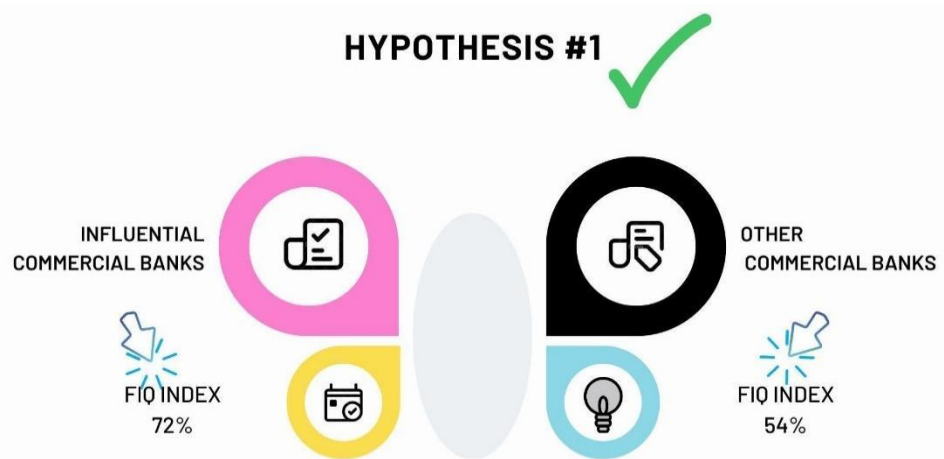
Two possible approaches used in prior researches to estimate index of financial reporting quality are weighted and unweighted index methods (Bandara, 2020).. In our research, we used the unweighted index method to calculate the quality index of financial statements, i.e., the 5 qualitative characteristics have the same weight.

When we tested our hypothesis in the research methodology section, the following results were obtained.

H1. The average quality index of financial information of 5 influential banks in the banking system is 72%, and the index of others is 54%. Deriving out of this, our first hypothesis is consistent with the research results. In other words, the quality of financial information presented to the public by influential commercial banks is relatively higher than the quality of information for other banks, which shows that influential banks are more responsible in presenting their financial information.

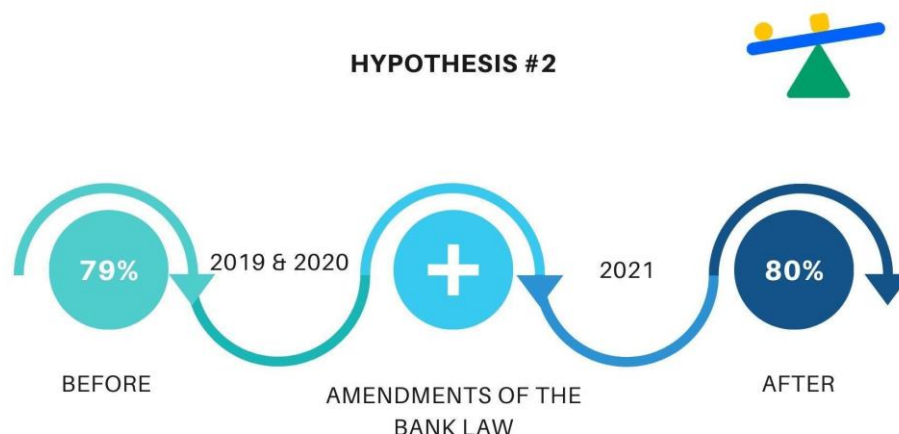
So, we assumed and tested whether this quality index increased after the amendment of the law requiring that influential banks have to be listed company.

Figure 2. Result of hypothesis 1



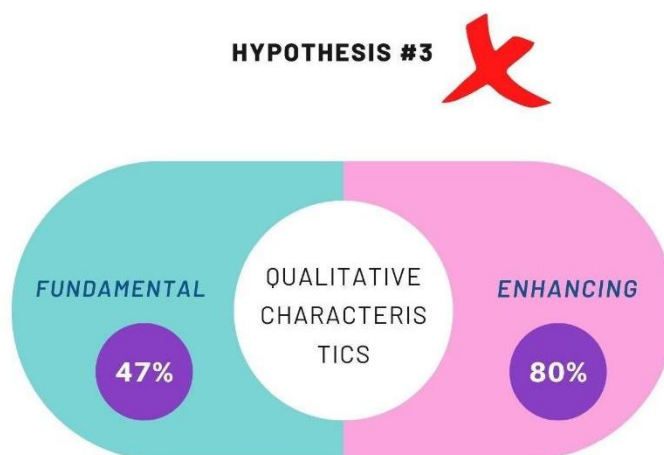
H2. The average financial information quality index for 2019-2020 is 79% before the legal amendment is issued, while the average financial information quality index for 2021 is 80% after the legal amendment. According to this result, the amendment of this law did not materially affect the financial information quality index of influential banks. Therefore, the quality index of information presented by influential commercial banks has been relatively high. When we tested this hypothesis, we excluded the assessment of the quality of financial information in 2022 and produced the results. Because, 5 influential banks did not present their 2022 annual report to the public, which distorted our research results.

Figure 3. Result of hypothesis 2



H3. According to the conceptual framework of IFRS, it is believed that the fundamental qualitative characteristics must be satisfied, while the quality of information is improved by satisfying the enhancing characteristics. Based on this concept, we hypothesized that commercial banks would meet more fundamental qualitative characteristics in their presented information, but the results were the opposite, enhancing qualitative characteristics index is higher. According to this, financial information is presented in a timely and structurally clear way, but the fundamental characteristics, the content of the information that is relevant and faithfully representation to the user's decision-making, is insufficient.

Figure 4. Result of hypothesis 3



5. CONCLUSION

In Mongolia, the banking sector accounts for the majority of the financial market. In 2021, amendments to the Banking Law added the concept of "bank with influence in the banking system" and Article 4.2 states that "a bank with influence in the banking system shall be a public company, and other banks shall be listed company". According to Section 4.2.7 of the Law on Accounting, enterprises and organizations engaged in commercial banking have to comply with "International Financial Reporting Standards. According to IFRS conceptual framework, the qualitative characteristics of useful financial information are classified as fundamental: relevance and faithful representation, and enhancing: timeliness, comparability and understandability.

Classified the methods of evaluating and measuring the quality of financial information as Accrual Model, Value relevance Model, Special Elements annual report and Qualitative Characteristics Model. The qualitative characteristics model is a method of directly measuring the quality of financial information by assessing the qualitative characteristics of useful financial information developed by the IFRS Board. We evaluated the financial and annual reports presented by commercial banks using the questionnaire developed by Beest, Braam, and Boelens, processed the analysis with the SPSS program, and produced the results. Considering that the average quality index of financial information of 5 influential banks in the banking system is 72%, and the index of others is 54%, the quality of financial information presented to the public by influential commercial banks is relatively higher than the quality of information for other banks, which shows that influential banks are more responsible in presenting their financial information. The average financial information quality index for 2019-2020 is 79% before the legal amendment is issued, while the average financial information quality index for 2021 is 80% after the legal amendment. According to this result, the amendment of this law did not materially affect the financial information quality index of influential banks. Therefore, the quality index of information presented by influential commercial banks has been relatively high. According to the conceptual framework of IFRS, it is believed that the fundamental qualitative characteristics must be satisfied, while the quality of information is improved by satisfying the enhancing characteristics. Based on this concept, we hypothesized that commercial banks would meet more fundamental qualitative characteristics in their presented information, but the results were the opposite, enhancing qualitative characteristics index is higher. According to this, financial information is presented in a timely and structurally clear way, but the fundamental characteristics, the content of the information that is relevant and faithfully representation to the user's decision-making, is insufficient. In order to increase the index of the fundamental qualitative characteristics, commercial banks need to present in their annual report information on future forecasts and estimates, business risks and opportunities, and the impact of positive and negative events that occurred during the reporting period.

References

Journal articles:

- Бат-Ирээдүй Г.(2015). Нээлттэй компанийн засаглал ба зах зээлийн үнэ цэнийн шинжилгээ. МҮЦАЭХ. (2016). Хөрөнгийн зах зээлийн өнөөгийн байдал болон цаашдын хөгжлийн бодлогын талаарх санал асуулгын тайлан.
- Өлзийбаяр Ж, Жавзандулам Э, Гантулга Г, & Баттуяа Д. (2015). Санхүүгийн тайлангийн мэдээллийн чанар, түүнийг хэмжих нь.
- Одгэрэл, А., Энхцэцэг, Г., & Мөнхбат, Б. (2021). Санхүүгийн тайлангийн чанар ба хяналтын функцийн харилцан хамаарал. 13.
- Beest, F., Braam, G, & Boelens, S. (2009). Quality of Financial Reporting: measuring qualitative characteristics. *Working Paper, Nijmegen Center for Economics, Radboud University Nijmegen*, 01-108.
- Cheung, Evans, & Wright. (2010). An historical review of quality in financial reporting in Australia. *Pacific Accounting Review*. 0114-0582
- Herath, S. K., & Albarqi, N. (2017). Financial Reporting Quality: A Literature Review. *International Journal of Business Management and Commerce*, 2. No. 2.
- Juliane, P., & Suliani, R. (2017, 5 1). Value Relevance of Intangible Assets Recognized in a Business Combination. *Revista Contabilidade, Gestao E Governanca.*, 24(2), 167-184. <https://eds.p.ebscohost.com/eds/detail/detail?vid=1&sid=f35344f7-13bb-4d9c-8f0b-5846a974b87c%40redis&bdata=JnNpdGU9ZWRzLWxpdmU%3d#AN=153146012&db=bsu>
- Ninjin. (2019). Agency relationship and Financial disclosure effect on Information Asymmetry: Evidence from Mongolia.

Books:

- IASB. (2018). International financial reporting standards. *International financial reporting standards. IFRS Standards*. (2021). IFRS Foundation.

Thesis' and diisertations:

- Гантулга Г. (2018). Санхүүгийн тайлангийн мэдээллийн чанар, түүнийг үнэлэх нь. *Докторын зэрэг горилсон диссертаци*, 155.

Webs:

- Банкны тухай хуульд нэмэлт өөрчлөлт оруулах тухай. (2021, January 29). <https://legalinfo.mn/mn/claw/16388711266721/1638949857242064>
- Монголбанк. (2021, April 19). Банкны систем нөлөө бүхий банкныг тогтоох аргачлал. Монголбанк. <https://www.mongolbank.mn/file/files/documents/regulation/2021/A-104%20DSIB%20Framework.pdf>
- Банкны системд нөлөө бүхий банкны жагсаалтыг шинэчлэн батлах тухай. (2021, May 21). Монголбанк. <https://www.mongolbank.mn/mn/r/3092>

SSSED-15

THE APPLICATION OF STUDENTS' KNOWLEDGE BY THE MEANS OF LEARNING TECHNOLOGY THROUGH PROBLEM SOLVING

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Abstract: In today's fast-changing and unstable times, knowledge alone is not enough, creative, inventive, and modeling modes of thinking are just as important as "knowledge." [Edward De Bono, 2016] In the past, when the amount of knowledge was small and the means of acquiring knowledge were few, it was aimed to give a lot of knowledge, but nowadays, the amount of knowledge is huge, and it is not possible to learn everything by memorization, but also the means and sources for children to acquire knowledge. is very wide Therefore, there was a full opportunity for the student to have more knowledge than the teacher on the subject of interest. The results of the research were studied and the results were calculated on how the problem-solving methodology can support students in applying scientific knowledge and skills and acquiring practical knowledge. Also, the problems leading to differential equations have been searched for new ideas on how to improve the teaching methodology in a way that focuses on problem solving and the development of social science within the unit less

Keywords: Research subjects, needs, learning outcomes

1. Introduction

What skills should be taught to students to learn in new ways and prepare for the new world? Problem-solving training is critical to developing mastery skills for the new century. It is said that "life is all about problem solving". [Karl Popper, 1999], [N. Oyuntseg. et al., 2015]

Needs and requirements of problem solving learning methodology:

1. Do the right thing
2. Doing the right thing right
3. Application of new discoveries and innovations

[Table 1] Edgar Dale's learning pyramid

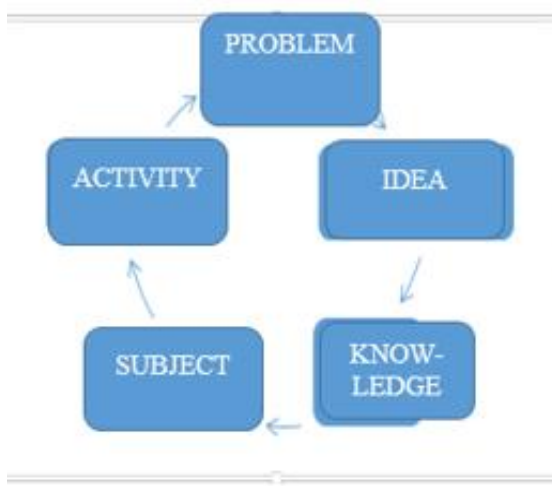
What is the focus of your lesson?	
10% of what you READ	Flipping teaching method/ Pre-reading
20% of what you HEARD	Listen to lectures
30% of what you SEE	Think and show on the board
50% of what you've heard and seen	Watch the presentation, watch the video, listen to the teacher's explanation
70% of what you say and write	Discuss and collaborate
90% of what you DO	Хэн нэгэнд заах

In traditional learning, listening to the teacher, reading books and textbooks, and looking at what the teacher and students write on the board are the main activities.

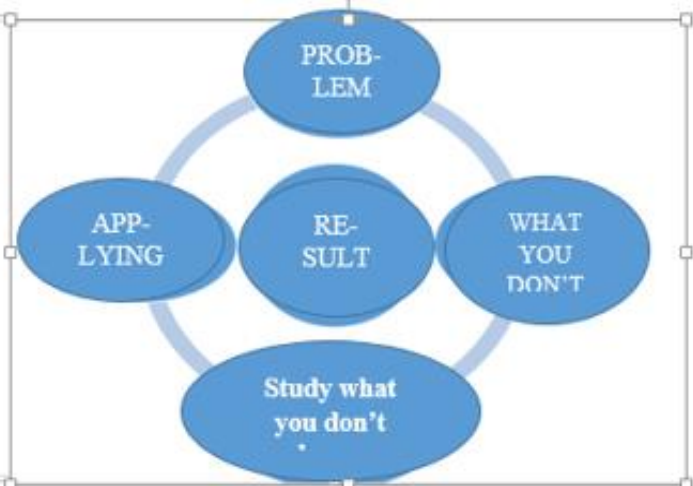
Historical development of problem solving learning methodology

- Used in medical schools in the 1950s
- Since the 1960s, it has been used in business, economics, and education courses.
- WEST /1992/ believed that supporting the implementation of the ASD methodology at the secondary school level has become an engine of school development.

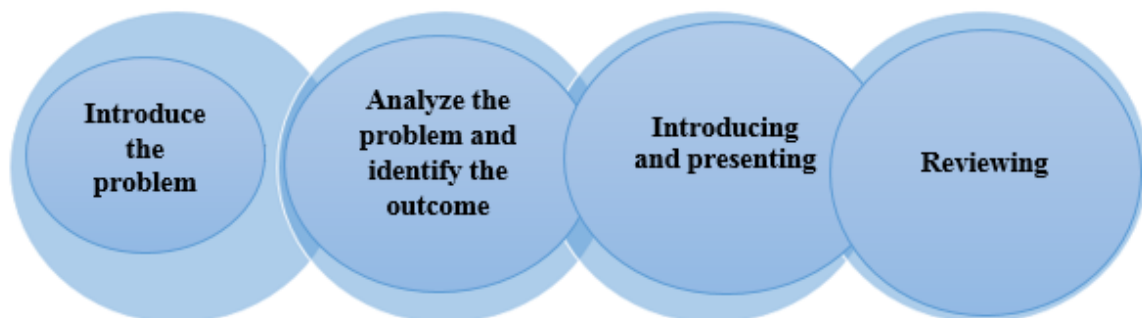
Model steps in problem solving learning methodology:



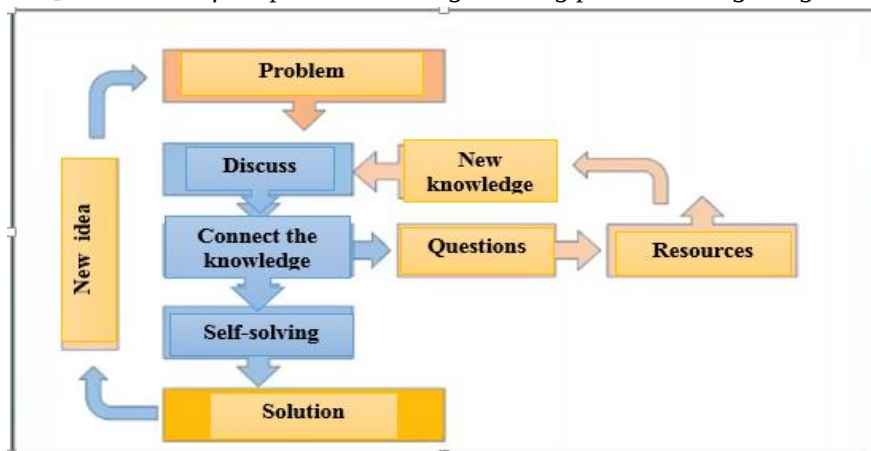
[Figure 1] Methodological cycle of ASC.
/UK Center for Local Education /2010/



[Figure 2] Problem solving learning process
/McLaughlin, B. 2010/



[Figure 3] Schematic of the problem-solving learning process /Oong-Seng Tan, 2002/



[Figure 4] Model and steps of problem solving learning methodology

What is problem solving learning methodology?

- Problem solving methodology (PSLM) is a teaching methodology that allows students to learn and work together to find solutions to real-life problems.
- Learner-centered teacher-directed, inquiry-centered learning that goes beyond the content to be studied. Content ownership is a long-term strategy. /David W. Mogk8 2004/
- Problem solving methodology is an alternative that focuses on hands-on learning rather than memorization. This requires higher level cognitive skills such as analysis, evaluation, creation, etc.
- Activities to present situations with a specific context to teams, define problems, decide what resources and capabilities are needed, and find possible solutions /Duch, Groh, and all-n8 2001/

[Table 2] Characteristics and advantages of problem-solving training

<i>Problem-solving learning covers all three domains of learning</i>		
KNOWLEDGE	Psychomotor /manual, physical skills/	Students develop their skills by reading and analyzing information
EFFECTIVE	Affective /attitude and self/	There is a need to consult with others.
PSYCHOMETER	Cognitive /mental skills and knowledge/	Make physical movements to understand the problem and explain it to others

Problem-solving learning encourages students to perform activities using recall, understanding, application, analysis, evaluation, and creation-level skills.

The PSL methodology prepares a lifelong learner.

- Seeks knowledge and information.
- Analyzes data.
- Learns from others.
- Builds self-esteem and self-esteem.
- Can face and solve problems.
- Shares knowledge and information.
- A learning environment that promotes critical thinking and problem solving.
- Increases motivation.
- Increases positive teacher-student relationships.
- Requires the use and application of knowledge and information acquired in other subjects.
- Better links and integrates knowledge.
- Integrates between courses and fields.

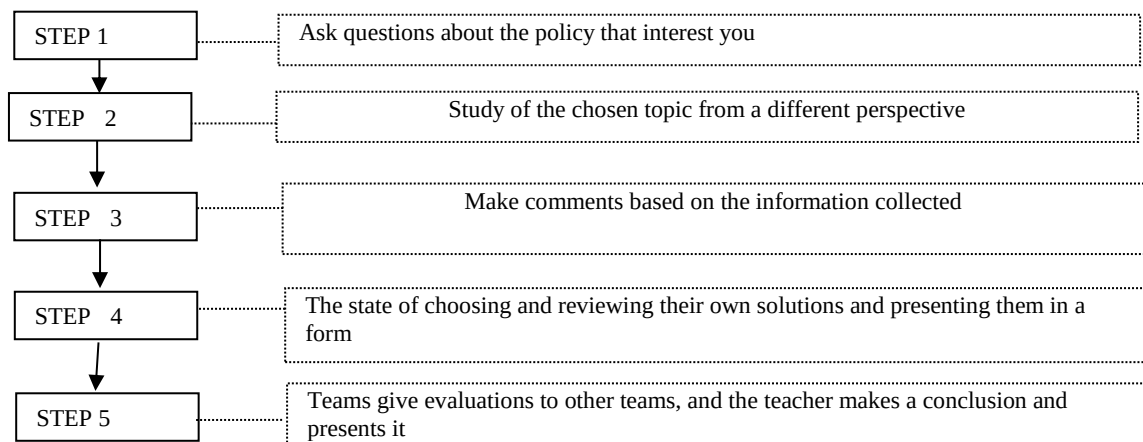
PART OF THE RESEARCH: 46 students of the "Ordinary Differential Equations" course of the School of Blacksmithing Technology of SHUTIS participated in the study.

Idea of the course: Problem-solving learning technology is considered to be important to develop the ability to solve problems intelligently or "Creative thinking" on the one hand. Thus, in the context of the topic "Problems leading to differential equations", a new idea has been searched for how to improve the teaching methodology in a way that focuses on problem solving and development of the experimental lesson for teaching lectures and seminars.

SAMPLE OF SELF-ASSESSMENT- /Included in 1 policy opinion as an example from a total of 10 policies./

Population growth model: If the population of a country was 100 million at the beginning of the year (January 1), and the average annual growth rate is 1.41.4 percent, how much will it reach after 55 years? On the basis of solving the above problems, the following steps were taken to create the model /Diagram No. 2/ lessons can be arranged.

[Table 3] The process of lesson



[Table 4] Role of teacher

	Make a decision before class	Start the lesson	Supervise team work and interfere with team work	Evaluate team work
A	Identify your academic and social goals	Establish positive relationships	Monitor student behavior	What were some of the successes in working together?
B	Determine team size	Explain the academic tasks of the course	Interference with team work	Clarify and tell what needs to be improved next time
C	Divide students into teams	Explain the success criteria	It includes: Providing meaningful assistance in the execution of tasks	The evaluations given by the teams to each other will be analyzed.
D	Organizing the classroom	Organization of personal responsibility	Teach and teach the skills of working with others	Organization of personal responsibility
E	Prepare your materials	Prepare your materials	1. To evaluate the participation of the team in the lesson 2. Note: The average of the ratings given to each team member will result in a team rating. One team will evaluate the participation of other teams.	

[Table 5] Role of students

	Study reading in the context of the problem	Prepare the right questions	Explain the policy to others	Evaluate the participation of other teams in the lesson

In the previous lesson:

Problem: /Heated the chicken to 1500 and took it out of the oven. What is the temperature $T(t)$ of the chicken after time if the temperature has dropped to 900 3 minutes after release? Assume that the temperature of the room was constant at 200./ Consider several different direction problems leading to differential equations.

1. **Introduce the problem:** How is it different from the previous policy?

2. **Analyzing student problems and clarifying learning problems:** Given an average growth of $p\%$, determine the growth after n years.

3. **Discovery - each student solves his own problem and finds the answer:**

After 5 years, $(1 + \frac{1.4}{100})^5$ will increase.

4. Presenting the solution to the problem, explaining and revising the policy in mind:

$$\left(1 + \frac{1.4}{100}\right)^5 * 100\ 000\ 000 = 107198763$$

5. Summing up by the teacher:

40 students participated in the lesson. 5 students worked together as a team. With a team score of 7

[Table 6] Self assessment

№	Indicator	The average of the total scores of the team members							
		I	II	III	IV	V	VI	VII	VIII
1	Ask questions about the policy that interest you	25	21	28	24	26	24	21	23
2	Study of the chosen topic from a different perspective	28	24	28	24	25	25	21	24
3	Make comments based on the information collected	26	24	27	23	26	24	21	24
4	Present your solution in a chosen format	25	23	28	23	25	24	21	23
5	Total score	35	35	35	35	35	35	35	35
6	Total scored	26	23	27.75	23.5	25.5	24.25	21	23.5
		+++	-	+++	-	++	+	--	

+++ - Team members participated evenly.

++ - Conduct good problem-related research with equal participation of team members

+ - Increasing the participation of team members and conducting research related to the problem

- -Increasing the participation of the team members, conducting research related to the problem, formulating the questions optimally

[Table 7]. Evaluation of "Problem Solving Training" by rubric method

Indicator	Unsatisfactory	Average	Good	Very good
Time usage and performance /individually and in groups/	It was not completed on time and with poor quality. - Not done at all	- On time but poor quality - Not on time, but executed with quality.	Included on time but slightly lacking in performance	Delivers on time and with quality
Active participation /per student/	Students who did not participate at all	He did not come up with any new ideas in teaching, but actively participated in what he was best at.	Actively participates in the implementation of a single new idea.	Proposes many important ideas and actively participates in their implementation.
Innovation	Do not reflect your own ideas	He turned the teacher's advice to his own advantage.	Tried new ideas but failed	The new idea was successfully implemented.
Creative thinking and attitude	Perform less important to you	Processing is done, but no further improvements	Determined the importance of the lesson. Based on research	Based on multidisciplinary research, developed and improved 1-2 times.

Possibility of reuse in training	Courses are unusable and self-contained	It can be used for training, but it is less important and has errors	It can be used for training. It has the advantage of improving and setting an example for others.	It is suitable for creating a library of teaching materials, reflects new ideas, is understandable and accessible to students.

[Table 8] Skills developed by students assessed self-assessment

At what level did you master these skills when you studied Ordinary Differential Equations? Excellent-1, Good-2, Average-3, Unsatisfactory-4				
Abilities	Average value		The evaluation of experimental and control class was examined by t-test	
1. Communication skills	Test course	Review course	t test	P(sig)
1.1. Friendly, tolerant and mutually supportive relationships with others	3	2.6	2.491	P=0.019
1.2. Respect and listen to the opinions of others	3.21	2.6	2.792	P=0.037
1.3. Answer questions quickly and accurately and express yourself	2.57	2.46	0.682	P=0.501
1.4. Explain physical phenomena simply and clearly in the language of physics	2.89	2.42	2.294	P=0.03
1.5. Collaborate with others to solve any problem and contribute to it	3.03	2.67	-2.423	P=0.022
2. Ability to work with information sources				
2.1. Use of research works	2.73	2.5	-0.293	P=0.772
2.2. Use of methodological literature	2.88	2.51	1.872	P=0.07
2.3. Independently search for literature on the subject of interest	3.02	2.57	2.503	P=0.017
2.4. Finding useful information on the Internet	3.14	3.02	0.627	P=0.535
2.5 Processing of Information	3.02	2.42	3.340	P=0.02
3. Leadership ability to organize				
3.1. Organize training activities independently	2.82	2.46	2.287	P=0.03
3.2. Ability to execute and have initiative	2.67	2.60	0.319	P=0.752
3.3. Self-management practices (having goals, planning, self-awareness)	2.82	2.78	0.225	P=0.823
3.4. Take responsibility for making decisions	3.35	2.85	2.372	P=0.025
3.5. Be critical	3.03	2.57	0.225	P=0.823
4. Ability to test				
4.1. Determine the sequence of actions and actions needed to prepare and conduct the experiment	2.96	2.46	2.324	P=0.028
4.2. Perform basic physical measurements to assemble test equipment in accordance with test objectives and interact with instruments	2.92	2.21	-3.286	P=0.03
4.3. Briefly explain the test results	2.82	2.57	1.192	P=0.244
4.4. Test your theoretical knowledge with an experiment to analyze the experiment	2.92	2.35	-2.661	P=0.013
4.5. Choose the method of processing the test results and calculate the error	3	2.17	3.759	P=0.001
5. Self-analysis ability				
5.1. Distinguish between the main and non-main aspects of the work done	3.03	2.96	0.284	P=0.779

5.2. Find the shortcomings of your work and solve them creatively	2.89	2.50	1.784	P=0.086
5.3. Formulate the innovative aspects of the completed work	2.53	2.39	-0.583	P=0.565
5.4. To explain and understand what you have heard from the lecture and read from the book in relation to the influencing factors	3.10	2.53	-3.286	P=0.03
5.5. Evaluate your own contribution to the work performed as a team	3.32	2.89	2.441	P=0.043
6. General physical ability				
6.1. Learning the methodology and methods of physical research	2.82	2.42	2.091	P=0.046
6.2. Applying mathematics to modeling and explaining real phenomena and processes	2.50	2.28	-0.532	P=0.599
6.3. Explain physical phenomena simply and clearly in the language of physics	2.32	2.39	0.359	P=0.599
6.4. Optimizing the choice of physical parameters to abstract and represent the real object in certain conditions	2.39	2.35	-0.140	P=0.889
6.5 To observe and find the real characteristics of physical phenomena	2.07	2.53	0.893	P=0.035
7. Ability to think				
7.1 Ability to analyze policy situations	2,78	2,57	-2.140	P=0.026
7.2 Apply concepts, laws, and theories used to explain the phenomena in the policy	2,78	2,75	-0.171	P=0.885
7.3 The ability to identify similarities between phenomena and create better models	2,67	2,46	1.652	P=0.110
7.4 Use reference tables of physical quantities	2,89	2,42	2.458	P=0.05
7.5 Ability to check the amount of results and make necessary calculations	2,89	2.39	1.724	P=0.096

As can be seen from the table, the development of friendly, tolerant and mutually supportive relationships with others; respect and listen to the opinions of others; quickly and accurately answer questions and express yourself; solve any problem together and contribute to it; independently search for literature on the subject of interest; finding and processing useful information on the Internet; independently organize educational activities; take responsibility for making decisions; test your theoretical knowledge of problem solving and modeling in accordance with experimental objectives; choose the method of processing the test results and calculate the error; understand and explain what you hear in lectures and read in books in relation to influencing factors; evaluate your own contribution to the work performed as a team; acquire research methods; There is a statistically significant difference in the ability to analyze the policy situation, but there is a slight variation in other indicators, but no significant difference was observed.

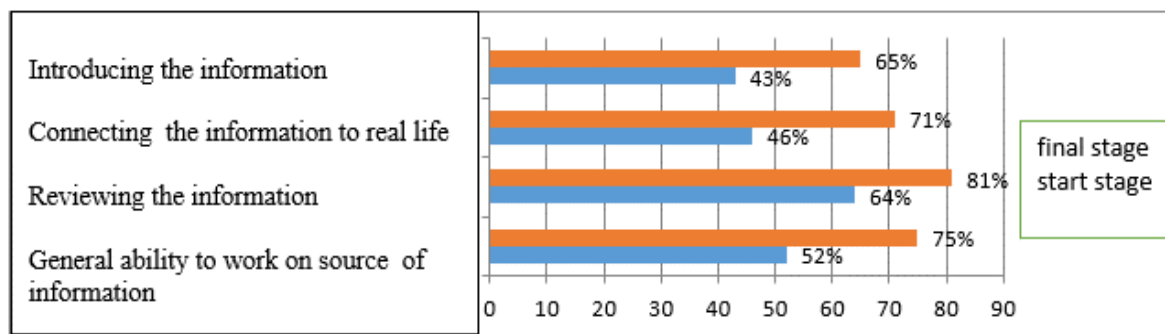
In accordance with the results of this research and the goals and objectives of the special program of the differential equation course, four groups of skills were selected and evaluated: problem thinking, testing, working with information, and the ability to communicate with people.

2.The result

We have evaluated the student's ability to work with information sources within the framework of basic competence with the evaluation criteria developed by us, and if there was a difference in the students' ability to work with information sources at the beginning and at the end of the experiment, using the paired sample t test method, we analyzed the evaluation:

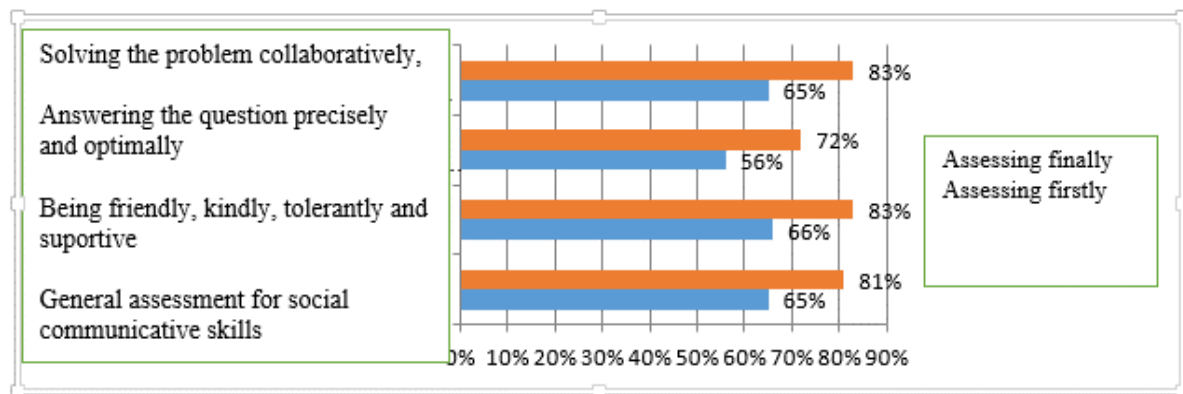
general assessment of the ability to work with information $t=22.557$, $p=.000$; the state of gathering information and processing theoretical information according to the given task $t=-14.208$, $p=.000$; enriching the processed information and connecting it with life practice $t=-8.818$, $p=.000$; $t=-8.898$,

$p=.000$ is shown in Figure 2



[Figure 5] Evaluation of the ability to work with information

To assess social communication skills: general assessment of students' communication skills $t=-19.826$, $p=.000$; friendly, tolerant and mutually supportive relationship with others, ability to respect and listen to others' opinions $t=-8.165$, $p=.000$; answering questions quickly and accurately and expressing oneself $t=-14.657$, $p=.000$; $t=-11.325$, $p=.000$ to solve a problem together with others and contribute to it, which proves that there is a statistically significant difference (picture 3).



[Figure 6] Assessment of communicative skills

When evaluating the work of the teams, the teachers and students discussed and evaluated it together, not only was the evaluation fair, but they also had the desire to prepare their lessons in a more creative and interesting way. Communicative skills were evaluated by members of their own team and students from other classes, and the results were combined and included in the progress score. This reduced the phenomenon of ignoring others while explaining, focusing on other things, and interfering with others, and improved the active participation of students. The results of questionnaires and interviews revealed positive results in responsibility and relational attitudes.

3. Discussion, Conclusion

Problem-solving learning is appropriate for mathematics in the sense of doing the right thing, doing the right thing right, and applying new discoveries and innovations.

- It was found that the problem is stored in the student's memory for a long time when conducting a problem-based training on problems leading to differential equations.
- When evaluating the subject using the rubric method, it can be seen that the connection between the subjects can be improved, and the results of the subject can be significantly improved if the students do a good research on the subject.

- When evaluating the subject using the rubric method, it can be seen that the connection between the subjects can be improved, and the results of the subject can be significantly improved if the students do a good research on the subject.
- It has been proven that the content of the experimental course does not fit in time, the role of the teacher to guide and organize has increased, and it has been proven that the student's ability to learn independently, find solutions to complex problems, improve productivity, and cooperate with others.

References

- [1] S. Bathuyag "Renovation of traditional methods of education" 2012 pp. 83-85.
- [2] Kemmis N, Taggart K "Textbook of Action Research" 3rd ed. 2015 pp. 14~21
- [3] G. Orhon "Higher Education Reform Project" UB, 2013
- [4] D. Badarch "Innovation of higher education reform" UB, 2013
- [5] B. Jadambaa "Learning by doing" 2010
- [6] Almonds. Anonymous S. Teaching tools UB. 1984
- [7] Sh. Ichinkhorloo, G. Dolingor "Training" 2005Ном зүй
- [1] Contemporary student and humanitarian science" 2015
- [2] "A multi-case study of student interactions with educational robots and impact on Science, Technology, [3] Engineering, and Math (STEM) learning and attitudes"
- [1] <http://www.floridatoday.com/story/money/business/2016/03/20/gaining-stem-steam-economic-future>
- [2] www.nsta.org/publications/news/story

HSLs-16

Implementing computer-assisted language learning in the teaching of second language listening skill

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Abstract: The acquisition of second language listening skills is an area of second language research that has, until recently, been seen as being a passive skill that was acquired simply by listening to a conversation. Due to this assumption, students were expected to comprehend the meaning of an aural text in terms of what took place and in what context. Over time, this failed approach has made second language instructors question the efficacy of their listening instruction and the effect it had in the classroom. Today, listening has changed from being thought of as a passive skill, to one that requires interaction in order to be fully acquired. This new concept in the acquisition of listening has forced second language instructors to reexamine their listening approach and to seek out alternative ways to engage students in the target language. Applying the appropriate teaching method plays an important role in the teaching/ learning process including teaching listening as a skill. The listening skill is one of the four most important and difficult skills to be taught in EFL. Students are facing an unprepared to function in the new world. And as a third point, in most classes students are unmotivated and act as passive listeners. This study aims to demonstrate that the use of CALL (Computer Assisted Language Learning) is an effective method to students from first year level at Mohamed Kheider University were subjects of the experiment during a period of one semester.

Keywords: second language, listening skills, approach, second language instructors, passive-skill.

SSIT-17

The survey of current labor market in Mongolia

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Abstract - Labor market Development is one accelerator factor of development corridor of Mongolia. It is important to decrease the poverty by employment to provide total population by equal benefit of current economic development of Mongolia. More than population growth the rapid growth of active population is remaining in recent years. In one part the supplying of employment is increasing in labor market and on the other hand level increase of involvement of employment is almost insensible, thus there is a need of having governmental adjustment in this imbalanced situation. The clear policy of the labor market creates economic resource, therefore the citizens are wealth and companies become more powerful by its employments.

Keywords: Key words: demand, supply, state regulation, labor market situation

1. Introduction

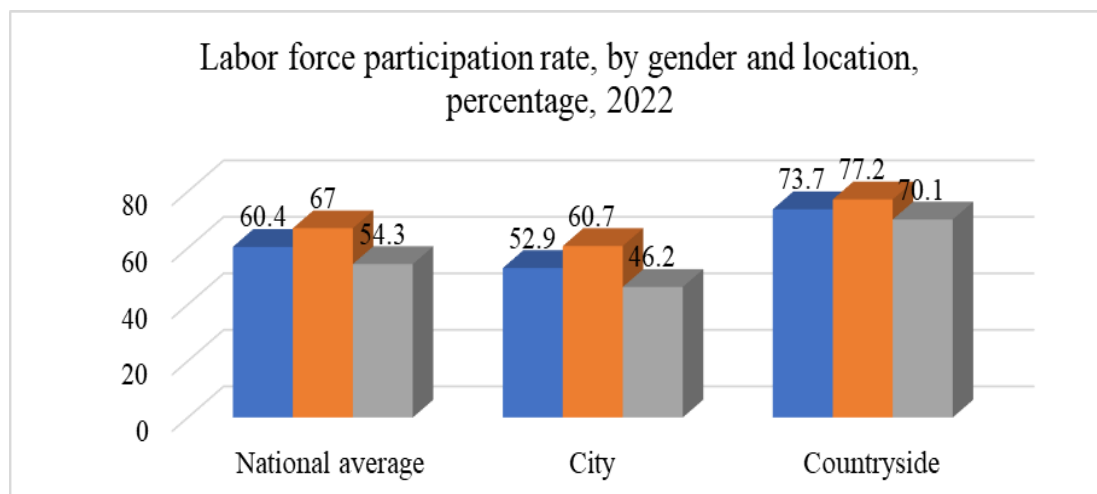
As the process of globalization deepens, the differences in the development of countries are increasing, and the countries of the world agree that employment should be a core part of the economic and social policies of each country. Labor is the main basis for meeting the ever-growing material and intellectual needs of society. This economic concept can be considered from two sides. The labor market is the mechanism, norms, and set of the economic system that ensures the reproduction of labor force and the utility of labor. The concept of labor market has been completely new in our country since 1990. The labor market is a system of social relations related to labor remuneration [1].

- Labor demand is inversely related to wage growth.
- All firms that want to maximize profits impose the above conditions.
- The labor market is a place where labor supply (labor force, employers) and labor demand (factory owner, state, and employer) are informed about the positive aspects of the two markets, and where labor contracts can be signed or thought about.

I. The survey of the current situation of labor market in Mongolia

Since Mongolia's transition to market relations, significant progress has been made in the economy and labor force structure. According to the labor force survey of the fourth quarter of 2022, there are 2,053,900 people aged 15 and over in the country, of which 985,200 (48.0%) are men and 1,068,700 (52.0%) are women. The current economic population (e.g. Economic Active Population) is 1239.8 thousand, which is 60.4 percent of the total population aged 15 and over. 814.1 (39.6%) thousand of the population aged 15 and older are economically inactive, 325.6 thousand are men and 488.5 thousand are women. Of the economically inactive population, 621.4 (76.3%) thousand live in cities and towns, and 192.7 (23.7%) thousand live in rural areas. The low rate of economically inactive population in rural areas contributes to the high labor force participation rate. According to the results of the fourth quarter of 2022, the labor force participation rate (LPR) is 60.4 percent nationwide, 52.9 percent in cities, and 73.7 percent in rural areas[3]. The labor force participation rate is 20.8 percentage points lower in cities than in rural areas, which is

due to the fact that the percentage of students in urban and rural areas is higher than in rural areas Figure 2.



[Figure 2] Labor force participation rate, by gender and location, percentage, 2022

The economically inactive population at that time was classified by the following reasons: those who study at school and those who are going to study, those who work at home, pensioners and the elderly, those with disabilities, who do not want to work, who take care of children, who were sick, who took care of patients and the elderly, and others (Figure 2.2) .

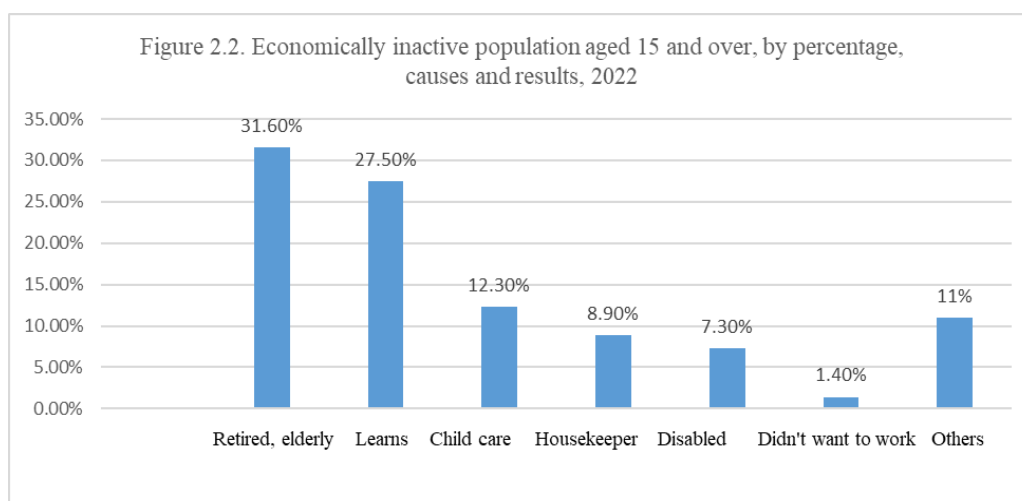
Considering the reasons for the economically inactive population, 257.6 thousand are retired and elderly, 223.5 thousand are students, 99.9 thousand are taking care of children, 72.4 thousand are housewives, 59.8 thousand are disabled, 15.5 thousand are sick, 12.0 thousand are patients, care for the elderly, 11.2 thousand did not want to work, 7.2 thousand said they were going to study, and 55.0 thousand were economically inactive citizens for other reasons. As of the 4th quarter of 2022, the workforce reached 1132.8 thousand, 55.3 percent of whom are in cities and towns, and the number of employed people varies greatly by region. 448.3 (39.6%) thousand of all employees are in Ulaanbaatar city, 249.0 (22.0%) thousand are in Khangai region, the highest number is 76.8 (6.8%) thousand in East region (Table 2.1).

[Table 2.1] Employees by the 4th quarterly in 2022 (gender, location, and region)

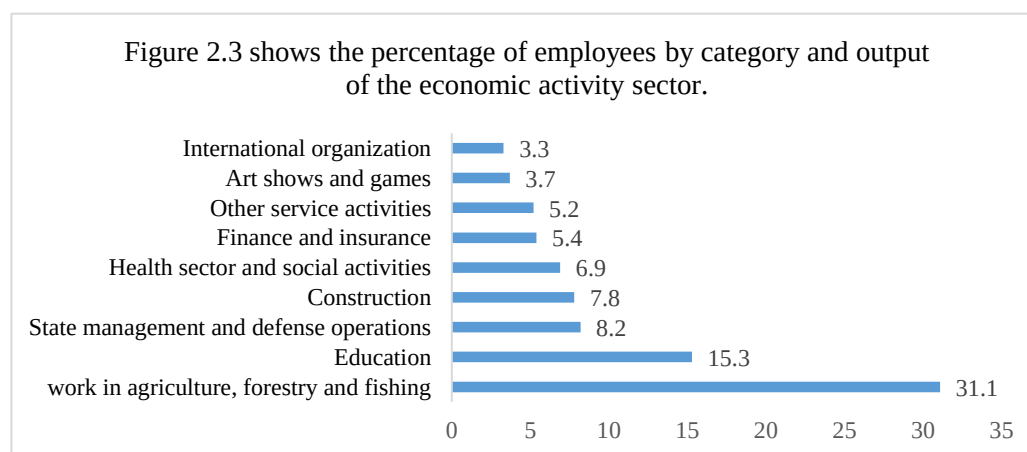
Location/ region	By gender					
	All		Male		Woman	
	Number	%	Number	%	Number	%
City	625 982	55.3	326 540	55.1	299 442	55.4
countryside	506 861	44.7	266 146	44.9	240 715	44.6
West	161 505	14.2	86 751	14.6	74 754	13.8
Hangay	249 022	22.0	127 216	21.5	121 806	22.5
Center	197 126	17.4	102 198	17.2	94 928	17.6
East	76 840	6.8	40 898	6.9	35 942	6.7
Ulaanbaatar	448 350	39.6	235 623	39.8	212 727	39.4
Score	1 132 843	100.0	592 686	100.0	540 157	100.0

Source: National Statistics Office, 2022

Women play a major role in Mongolia's economy. According to the latest data from the National Statistics Office, women make up the majority of the economically active population. If employees are classified by sector, there are many people working in the agriculture and trade sectors, and the gender ratio is generally close, but for some sectors, one gender is dominant. 352.0 (31.1%) thousand of the total employed population work in the agricultural sector. But 209.2 (18.5%) thousand work in production, and 571.6 (50.4%) thousand work in the service sector. Figure 2.3 shows the percentage of



employees by category and output of the economic activity sector[4].



Considering the working population by occupation, most of them, or 345.3 (30.5%) thousand, are employed in agriculture, forestry, and fishing. In addition, 187.0 (16.5%) thousand are employed in trade and services, 180.4 (15.9%) thousand are specialists, and 109.3 (9.6%) thousand are employed in production, construction, handicrafts, related work and services.

I. Labor demand in the labor market

The demand for labor force varies depending on the sector of economic activity, time, location and production capacity. For some industries, the use of equipment and technology rather than labor reduces the demand for labor force, while for some industries, the fact that they operate directly on the labor

force increases the demand in the labor market[5]. Regionally, 27.6 percent of Ulaanbaatar city enterprises plan to hire workers, which is a decrease of 8.3 points from the previous year, while 45.6 percent of central region enterprises plan to hire new employees, which is an increase of 0.4 points. For other regions, the percentage of hiring new employees has decreased. 36.2 percent of Khangai region's ANB, 34.9 percent of the eastern region's ANB, and 32.3 percent of the western region's ANB have plans to hire new employees, respectively. A total of more than 70,000 jobs were created in the country during one year, and the labor market has undergone positive changes as in previous years. During this period, there is a possibility of 12.9 percent increase in the number of AAN employees, but it is expected to decrease by 2.2 points compared to the results of the previous year's survey (Table 2.2).

[Table 2.2] Labor force demand in 2022, by sector and time

Sectors of economic activities:					
		Num	Per	Num	Per
Sector of economic activity; Agriculture, forestry, fishing, hunting	4927	2326	4.7	2601	12.4
Mining and quarrying	3343	2147	4.3	1197	5.7
Processing industry	10008	6866	13.8	3142	15.0
Supply of electricity, gas, steam and ventilation	1206	476	1.0	730	3.5
Water supply; sewage, garbage and waste management and cleaning operations	371	196	0.4	175	0.8
Construction	9808	7512	15.1	2296	11.0
Wholesale and retail trade; car and motorcycle maintenance	5491	3924	7.9	1567	7.5
Transportation and warehousing operations	3207	2393	4.8	815	3.9
Accommodation and food service activities	5720	4555	9.2	1165	5.6
Information and communication	2227	1798	3.6	429	2.1
Financial and insurance activities	898	699	1.4	199	1.0
Real estate activities	2117	1746	3.5	370	1.8
Professional, scientific and technical activities	1975	1332	2.7	643	3.1
Administrative and support activities operation	4856	3129	6.3	1727	8.3
Education	5531	3407	6.8	2124	10.2
Human health and social welfare activities	6557	5357	10.8	1200	5.7
Arts, entertainment and games	1549	1276	2.6	273	1.3
Other service activities	864	602	1.2	262	1.3
Total	70655	49742	100	20914	100

70.4 percent of the demand that will be created during the next year is expected to be created in the first half of 2023, which depends on seasonal and temporary jobs. During this period, there will be a greater demand for labor in sectors such as construction, manufacturing, human health and social welfare activities[6].

Suggestions and recommendations

1. Strengthen the information system necessary for effective employment policy development and collect employment information by gender[2].

2. To reduce the gap between the demand and supply of skills in the labor market, to update professional training programs, to establish professional standards, to create an on-the-job training system, and to strengthen the connection between the labor market by expanding the opportunities for employees to practice.
3. Every year, the demand for new jobs in the labor market is increasing, which indicates that there is an opportunity to increase the capacity of the labor market. Therefore, it is important to consider the balance of supply and demand of the labor market in the policies and programs implemented by the government.
4. Organization of employment policies and activities aimed at the labor force of our country with complete secondary education or below, unskilled and without work experience.
5. Emphasis on imparting and cultivating the personality and soft skills desired by employers through primary and secondary education, higher education and vocational training institutions, and effective implementation of labor preparation programs.

Conclusion

1. It is necessary to have many positions that has reliable source of incomes, proper work condition and possibility to improve living standards of families.
2. Proper activity of the labor market is essential to provide all of the Mongolian citizens by opportunity to make contribution for country by their potential resource.
3. It is unable to build up enough workplace for population of Mongolia by only economic growth and in recent 10 years even there was economic growth in Mongolia, the workplaces still in lack.
4. If appreciate steps do not taken to provide essential features that required in workplaces and employments' skills, it is impossible to completely use many opportunity that originated.
5. To increase employment by delivering information, properly locating the workplaces, giving advices and training in provinces.
6. There is a need of increasing investment on transport and sanitary faculties that develop substructures of local areas. By this way we can directly establish workplaces and get possible to influence in long-term economic development.
7. Even it is required having professional employments in building and mining, recently the employment demand stands more for branches of service, manufacturing industry, agriculture and trade.

Reference

- [1]. А.И Рофе (2018) Хөдөлмөийн зах зээл pp. 38-43
- [2]. Ж.Ариунболд Б.Басбаяр Ирээдүйн хөдөлмөрийн зах зээл, боловсрол pp 78-96.
- [3]. <https://ilostat.ilo.org/events/2021-labour-market-statistics-analysis-academy/>
- [4]. Mongolian Youth Employment Support Report 2022
- [5]. Methodology for the study of local labor market demand - 2021
- [6]. <http://hudulmur-halamj.gov.mn/statistic/show/id/123>

NGEE-18

Effects of solar radiation on agriculture area of Selenge province, Mongolia

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Abstract: In Mongolia, cultivation was first practiced in the valleys of the Kherlen River, Buir Lake, and Orkhon River near Kharkhorin. The Orkhon and Selengi basins, which are the main agricultural regions of Mongolia, are mainly black and dark brown soils. However, the crop grown in Selenge province is more than expected. We have tried to explain this phenomenon in connection with solar activity. According to the research work, the harvest and rainfall of Dzunburen sum of Selenge province were compared with solar activity. Based on the results of the research, the harvest of the coming years can be predicted in accordance with the 11-year cycle of solar activity, and appropriate conclusions were made.

Keywords: Wolf number¹, solar intensity², total yield³, average temperature⁴

1. Introduction

In Mongolia, farming was first practiced in the Kherlen River, Buir Lake, and Orkhon River valleys around Kharkhorin, and then spread along the Tuul and Selenge river basins. At present, it is mainly engaged in the Orkhon and Selenge basins, which are the main agricultural areas. The "A" layer of Selenge soil is the upper part or the most fertile part, and it is dark in color and has a soil cover with a lot of organic matter [1]. The yield of Dzunburen sum of Selenge Province is higher than estimated. We will attribute this fall to solar activity. Selenge province, which grows 36.18% of the total harvest of our Mongolian country, has been increasing and decreasing in recent years [2]. We can relate this process to solar activity and predict how future harvests will be affected (natural disasters such as drought, drought, precipitation and global magnetic storms).



[Figure1] Indicators of harvest in Mongolia in 2014-2016

The Sun is 149 million 450 thousand km away from the Earth, but the processes taking place on the Sun directly and indirectly affect the Earth [3]. Solar activity is a special phenomenon that occurs on the Sun. During solar activity, "dark spots" are formed on the sun. This is expressed as the Wolff number. There are also strong explosions. Solar activity occurs with a frequency of 11.2 years [4]. At this time, the solar magnetic poles are completely reversed. This year, the 24th of the 11-year cycle of "solar activity" continues. During solar activity, the solar wind X-rays and UV rays from the sun increase. As a result of this, natural phenomena such as heat, drought, drought, and drought are increasing in the world, which negatively affects agriculture and harvesting.

2. Survey Research

2.1 Physical geography

In terms of physical geography, the sum is located in the Orkhon Selenge basin of the mountainous province of Khangai Khentii, in the region of medium-high mountains. The average altitude is 1000 meters. The soum is a fertile area of the Orkhon River in front of the Selenge River, with dark brown soil and a combination of forest and steppe with small mountains and small mountains, which is a very suitable place for farming and raising animals [5].

Climatic conditions

There is one permanent meteorological observation station. In terms of geographical location, the cold and temperate climate of the Arctic Ocean is affected, but it is located in the lap of the Bureng mountain range, which is covered in winter as a natural barrier.

The amount of sunshine per year is 2700 hours

The annual average of total solar radiation is 1200-1300 kWh/m²

- The average temperature in January is -21.8 °C
- The average temperature in July is 20.3 °C
- Average annual rainfall is 227mm
- The number of days with snow cover is 135
- The number of rainy days is 35
- Average annual wind speed is 2.4 m/s
- Average annual air pressure is 900 gPa

Zuunburen soum of Selenge Province is geographically located at the southwestern edge of Selenge Province. The total area of Zuunburen soum sub-district of Selenge district is 281454 hectares, of which 182819.63 hectares are used for agriculture and crops.

2.2 Population

With a total population of 3113, there are 1425 people and 412 households in the 3rd group of Tsagaan Ovoon, 922 people and 267 families in the 2nd group of Burgaltay, and 766 people and 209 families in the 1st group of Iveng.

Used data

Satellite data

"Daily solar activity" graphic data issued by the Solar Radiation Research Center of the United States National Space Agency (NASA) was used.

"Solar activity" data calculated 11 years in advance by the Solar Radiation Research Center of the United States National Space Agency (NASA) was used.

2009 and 2015 data from the LANDSAT satellite archived at the National Aeronautics and Space Administration (NASA) with a resolution of 15-30m were used.

GIS data:

- 1:180,000 scale vegetation map of Zuunburen Sum, Selenge province

- 1:1,080,000 scale natural belt map of Mongolia
- Administrative border information of Mongolia

3. Method

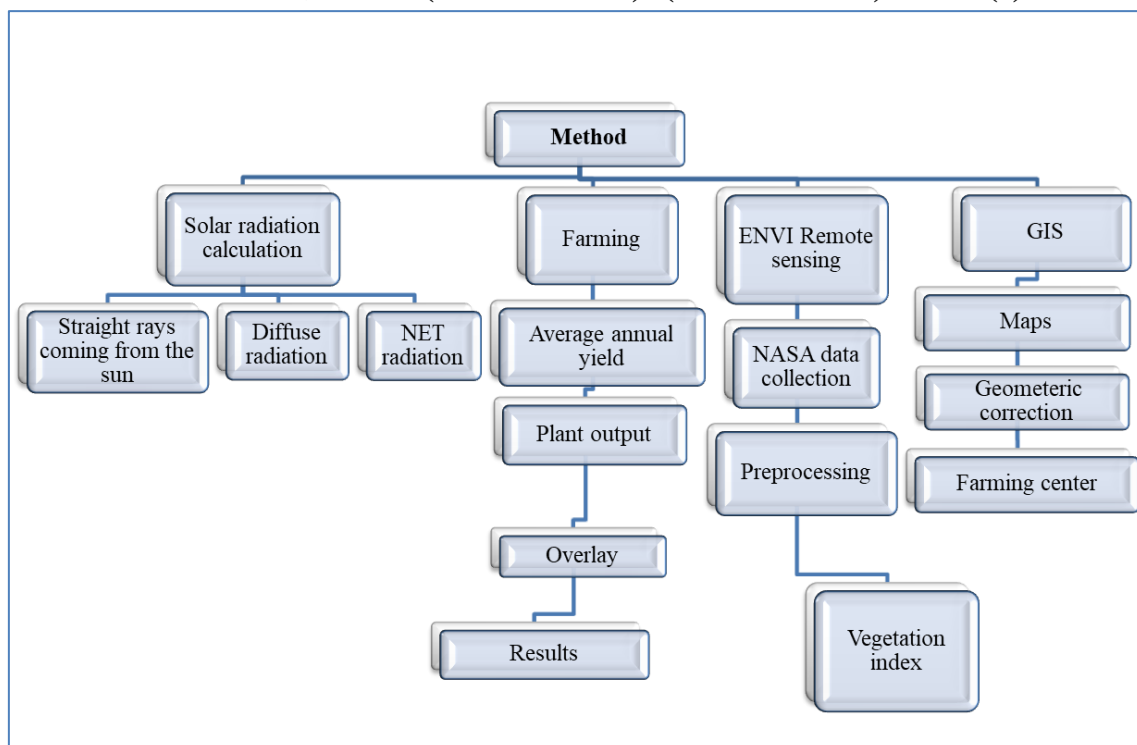
In this study, the crop yield of Zuunburen soum of Selenge province was compared using the 11-year forecast of solar activity and the total harvest data from 2009-2016 from the National Statistics Committee, and the harvest data of 2017 from the Zuunburen soum district of Selenge province. In addition, the natural phenomena [1] occurring in the area were studied. The obtained results were presented with the help of remote sensing vegetation index (NDVI) (Equation 1) and (Equation 2) showing the area with many crops. Landsat Normalized Difference Vegetation Index (NDVI) is used to quantify vegetation greenness and is useful in understanding vegetation density and assessing changes in plant health. Landsat Surface Reflectance-derived Normalized Difference Vegetation Index (NDVI) products are produced from Landsat 4–5 Thematic Mapper (TM), Landsat 7 Enhanced Thematic Mapper Plus (ETM+), and Landsat 8-9* Operational Land Imager (OLI)/Thermal Infrared Sensor (TIRS) Collection 1 and Collection 2 scenes that have been processed to Landsat Level-2 Surface Reflectance products. *Landsat 9 = Collection 2 only.

NDVI is used to quantify vegetation greenness and is useful in understanding vegetation density and assessing changes in plant health. NDVI is calculated as a ratio between the red (R) and near infrared (NIR) values in traditional fashion:

$$NDVI = (NIR - R) / (NIR + R)$$

$$\text{In Landsat 4-7, } NDVI = (Band\ 4 - Band\ 3) / (Band\ 4 + Band\ 3). \quad (1)$$

$$\text{In Landsat 8-9, } NDVI = (Band\ 5 - Band\ 4) / (Band\ 5 + Band\ 4). \quad (2)$$



[Figure 2] Scheme of research method

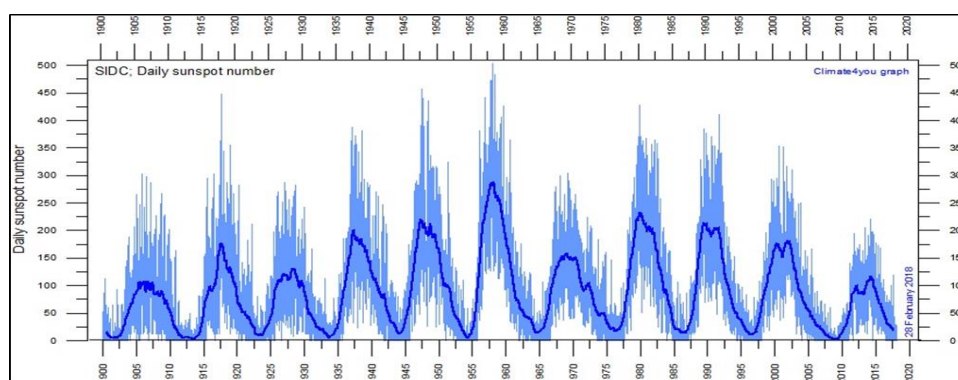
4. Results and discussion

The crops harvested from agricultural fields in Zuunburen soum Selenge Province will continue to grow year by year. Figure 3 shows from 2009 to 2017, the crop yield increased, but in 2015, there was a large crop loss. In that year, 37.1% of the crop was harvested in the country, and the remaining 63.9% was crop loss [6]. In that year, there was less rainfall in most areas in May and it was cool, and in June, it became very hot and it was very hot for 18-27 days, causing a drought. At this time, the maximum temperature in the air was 34-38 degrees, and the maximum temperature on the ground was 60-64 degrees.



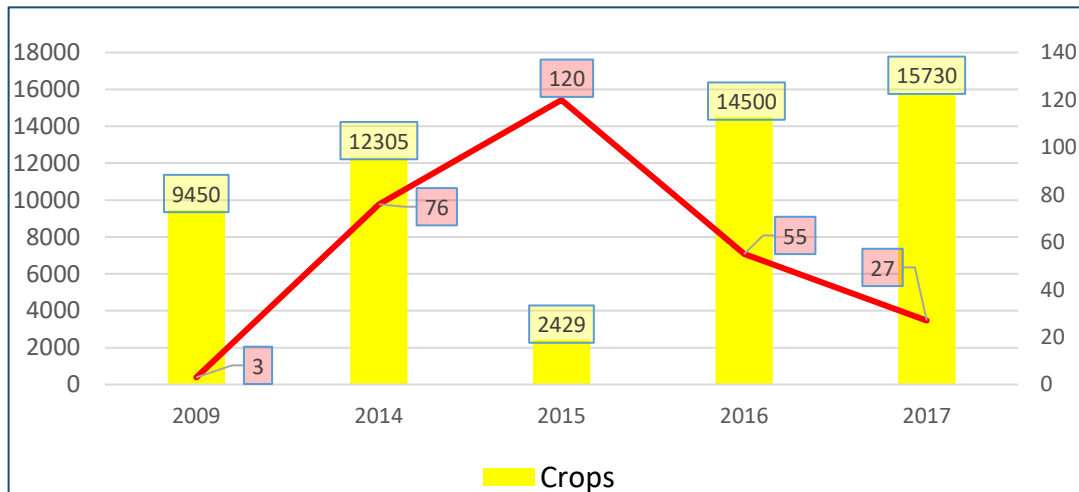
[Figure 3] Zuunburen soum crops in Selenge province in 2009, 2014-2017 years

In this year, the sun has completely changed its poles and reached its maximum value in the 24th period of solar activity (figure 4). Also, if you look at figure 3, it can be seen that in 2009, the 23rd period of solar activity ended and the 24th period began, and it reached its lowest value in that year.

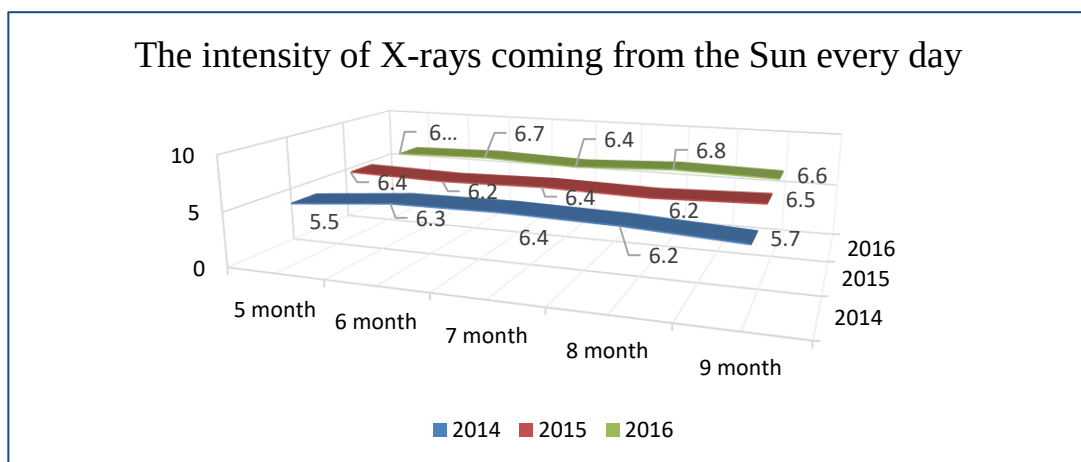


[Figure 4] A graph of daily solar activity from 1900 to 2018 years.

Figure 5 shows that when solar activity increases, grain yield decreases. How much does the intensity of X-rays coming from the sun every day affect the vegetation cover. The intensity of X-rays coming from the sun every day in the months of May, June, July, and August, which are the active months for planting crops, is very important (Figure 6).

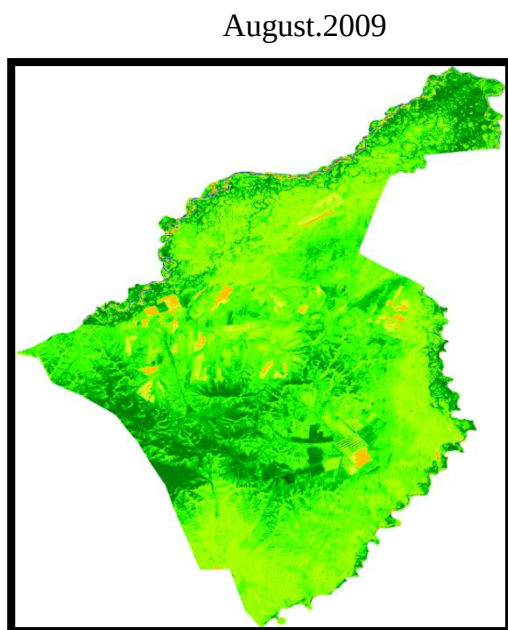


[Figure 5] Solar activity and crops comparison

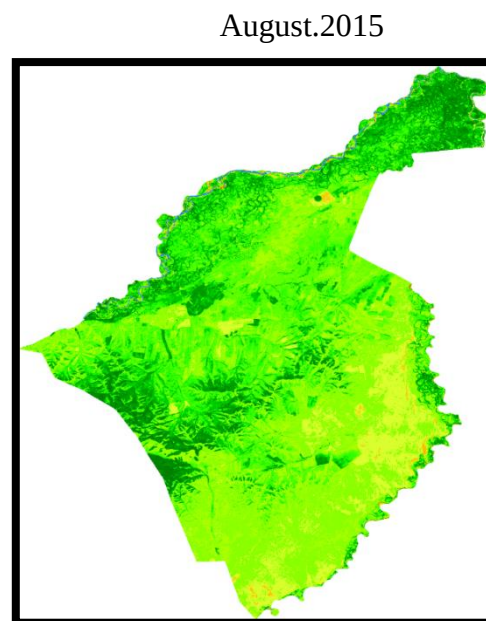


[Figure 6] The average daily intensity of X-rays from the Sun.

According to all of our calculations, in the years of increased solar activity, the harvest will decrease, but when the solar activity decreases, the yield will increase and the yield will be less. This estimate is confirmed by comparing satellite data from 2009 and 2015 (Figure 7), (Figure 8). In 2009, the minimum value of solar activity was obtained, and it can be seen that the margin of harvest, low yield loss, and good density of grain harvest were normal (Figure 1). However, in 2015, the solar activity reached its maximum value, and the climate became very hot and dry, and the harvest yield was 63.9%, and it can be seen that the grain density per unit area is low (Figure 8).

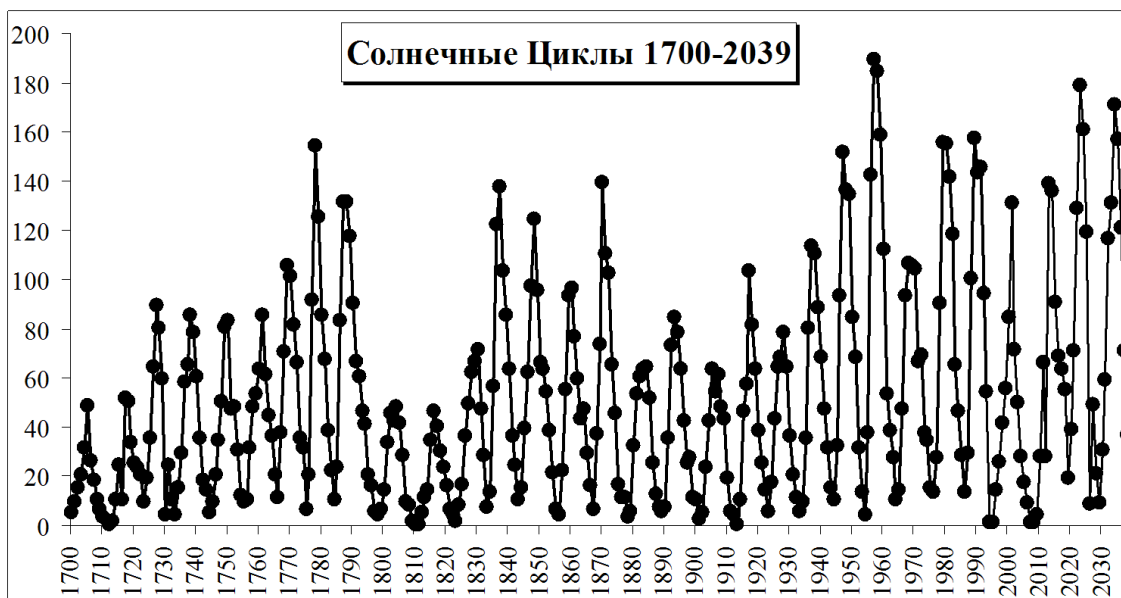


[Figure 7] Vegetation Index of August 2009 in Zuunburen soum of Selenge Province



[Figure 8] Vegetation Index of August 2009 in Zuunburen soum of Selenge Province

Therefore, it is possible to predict possible crop losses in the future by using the "Solar activity" forecast data (Figure 9) issued by the Solar Radiation Research Center of the United States of America's National Space Research Center (NASA).



[Figure 9] Solar activity forecast for 1700-2039 years, NASA

5. Conclusion

1. In 2009, when solar activity reached its lowest value, the yield was 9450 tons. But this year, it snowed more than the previous years, and it snowed in most areas. This is due to the minimum solar activity.
2. In 2014, when solar activity reached its maximum value /max/ 132, wheat was 12305 tons.
3. In 2015, solar activity reached its maximum value. This year's harvest is 2429 tons, which is 6-7 times lower than other years. This is due to the maximum solar activity.
4. In 2016, the solar activity decreased and the harvest increased to 14,500 tons.
5. In 2017, the activity of the sun decreased and the harvest reached 15,730 tons, the amount of harvest increased from previous years.
6. To sum up all this, when the activity of the sun decreases, the harvest has improved.
7. In 2020, the solar activity will reach its minimum value, and the harvest is likely to increase until this year. The 25th solar cycle will begin in 2021, and the solar activity will be relatively more influential than previous years.
8. Therefore, in 2024, 2025, and 2026, due to the influence of solar activity, it is likely that the harvest will be less than the previous cycle, leading to drought.

References

- [1] Handbook of Earth Studies-I, E. Tungalag, 2015
- [2] Manual of Zuunburen soum , Selenge province, 2017
- [3] Earth Studies Guide II, E. Tungalag 2015,
- [4] United States National Aeronautics and Space Administration (NASA) Solar Radiation Center website, 2018
- [5] Main site of Selenge province, 2018
- [7] R. Mijidsuren - Solar energy cadastre of Mongolia, 1985
- [8] D. Batdelger, B. Gira - Solar Cadastre of Mongolia 48 pages, 1987
- [9] National Statistics Committee, 2018
- [10] Russian Federal Space Research Center, 2018
- [11] United States National Space Agency (NASA) Solar Radiation Center website, 2018
- [12] Guide to Selenge Province, 2018

SSSED-19

Study on reliability issues of a general entrance exam of English in Mongolia

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Abstract - General entrance exam plays as a gatekeeper as the results of which determine the future path the high school graduates would go along by choosing which higher education institution they will study. In this sense, such a nationwide test in English ought to meet all the reliability criteria and be without any single error. On the other hand, what if the very test contains certain errors which then fails to be reliable affects the candidate's final scores. This would not only indicate the general entrance exam has poor capability to test the real knowledge and skills of English of the candidates, but also acts as a great hinder for the candidate's future selection of a university. Thus, this study on the reliability of the general entrance exam on English has been conducted to find the answer for the above-mentioned probable issue. Within the scope of this study, only the principle of reliability has been checked against the general entrance exams of English administered in 2020 – 2022. Adopting the analysis on documents as well as sampling methods, the researcher has categorised the errors into several types. From the results, we can clearly see that this exam falls short of reliability by containing erroneous items, hence, identifying factors that affect the unreliability issues so as to find potential solutions to meet the reliability criteria for the test. Thus, it is highly critical to do reforms in the content as well as the formats of the exam.

Key words: language testing principles, test items, grammatical errors, authentic English language use, ChatGPT artificial intelligence

1. Introduction

Assessment is a ubiquitous aspect of our daily lives, and the word "test" often elicits feelings of anxiety and apprehension. Large-scale evaluations and tests, in particular, can have a profound impact on a test taker's future career, education prospects, and life trajectory, serving as gatekeepers to various opportunities. For instance, the International English Language Testing System (IELTS), a premier large-scale English proficiency test, is a requirement for those seeking to study, work, or immigrate to English-speaking countries outside of the USA (Hamid et al., 2019). In Mongolia, the General Entrance Exam (GEE) is a high-stakes test that all high school graduates must pass to gain admission to a university. As thousands of graduates take the exam annually, it is crucial that the GEE meet all language assessment criteria, including reliability, validity, practicality, authenticity, and washback effect.

In this study, we focused on assessing the item reliability of the GEE, as error-free test items are essential for establishing reliable scores. To the best of our knowledge, no research has been conducted on this aspect of the GEE in Mongolia. Therefore, we aimed to answer the research question: "Are all the test items of the General Entrance Examination reliable?" To achieve this goal, we conducted a comprehensive analysis of the GEE materials administered between 2020-2022, comprising a total of 550 test items. Using ChatGPT, an artificial intelligence search engine, we identified 110 errors and

classified them into nine error types, including ambiguous options, incorrect answer options, instructional error, weak distractors, punctuations, erroneous item, unnatural use of English, insufficient context, and extralinguistic knowledge required. To illustrate our findings, we provided one or two examples for each error type.

Our results indicated that the GEE test items fell short of meeting the item reliability principle, with the highest number of errors (39 errors) being related to items containing ambiguous options. Additionally, 37 items contained one or two grammatical errors, while weak distractors and items requiring extralinguistic knowledge from a candidate accounted for eight errors each. Although instructional errors and confusing instructions had the lowest error rate, with three errors each, they nonetheless pose a threat to item reliability.

Overall, this study highlights the importance of assessing the item reliability of high-stakes tests, such as the GEE, to ensure that test takers' scores accurately reflect their language proficiency. Our use of ChatGPT as a tool represents the first-ever attempt to check the reliability of GEE test items in Mongolia, and we hope that our findings can inform future efforts to improve the GEE and other similar assessments.

[Table 1] The number of test takers in the past three years

No	Indicators	2020	2021	2022
1	Total number of test takers	29501	36782	37223
2	Total number of test takers of English	19120	22370	20284
3	Percentage of test takers of English	64.8%	60.8%	54.49%
4	Average score out of 100	37	42	35
5	Average proportionated score out of 800	500	500	500

(Retrieved from the GEE report 2022)

2. Literature review

Reliability is a fundamental principle of test development, and it includes several sub-principles. One such sub-principle is that a test item or task should not contain ambiguity for the test taker (Brown & Abeywickrama, 2010). However, despite the importance of reliability in test development, there is a lack of studies that have examined the General Entrance Exam (GEE) in Mongolia. To date, only one recent study has investigated the predictive validity of the GEE in relation to students' academic success in higher education institutions. Ankhbayar (2021) found that only around ten percent of the variation in students' academic success was explained by their GEE scores, highlighting the need to examine the reliability and validity issues of the GEE. In contrast, ChatGPT, a large language model created by OpenAI in 2021, has already been the subject of numerous studies internationally. ChatGPT uses machine learning algorithms to generate contextually appropriate responses to a wide range of user queries. It was trained on a massive corpus of text containing 300 billion words, allowing it to generate accurate and useful responses (Gonsalves, 2023).

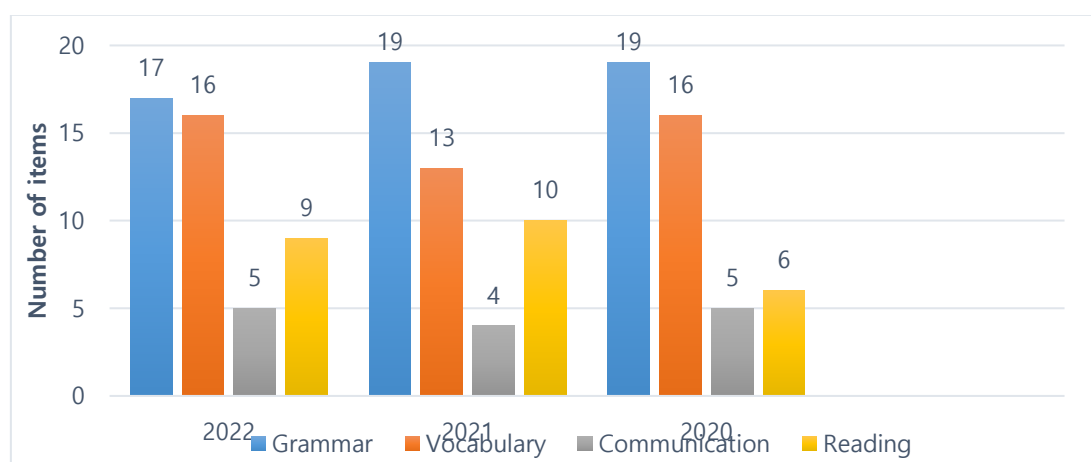
3. Methodology

The aim of this study was to examine the General Entrance Exam (GEE) materials administered from 2020 to 2022 to identify and classify any language-related errors in the test items and to verify their reliability. The 2020 GEE comprised four variants, each containing 50 test items, for a total of 200 test items. Variants C and D included the same items as variants A and B, but in a random order. The 2021 GEE consisted of five variants, each containing 50 test items, for a total of 250 test items. Variants C, D, and E also included the same items as variants A and B, but in a random order. Thus, a total of 650 test items were analyzed in this study. We conducted a detailed analysis of the test items to identify and

categorize any language-related errors using ChatGPT, the latest artificial intelligence machine, and ensured the reliability of our categorization by cross-checking the results.

4. Results

The analysis of the GEE materials administered from 2020 to 2022 revealed that the test has remained relatively consistent in terms of the number and types of items. As shown in the bar chart, the test has primarily focused on grammar, vocabulary, reading comprehension, and communication. The number of grammatical items decreased by two over the last two years. The number of vocabulary items ranged from 13 to 16 over the three years, while the number of reading comprehension questions increased from six to nine or ten in 2021 and 2022. The number of communication items remained constant, ranging from four to five. Overall, the GEE has remained largely consistent in terms of its content and format over the last three years.



[Figure 1] The number and types of test items 2020-2022

In this study, we conducted a comprehensive analysis of 550 test items administered between 2020 and 2022, in order to identify and categorize errors that may affect the reliability of the General Entrance Exam. Our analysis revealed a total of 110 errors, which were classified into nine different error types, namely: items with ambiguous options, incorrect answer options, instructional errors, weak distractors, punctuation errors, erroneous items, unnatural use of English, insufficient context, and extralinguistic knowledge required. Of all the error types, the most frequent were items with ambiguous options (39 errors) and items containing one or two grammatical errors (37 errors). Although weak distractors and items requiring extralinguistic knowledge each had eight errors, they were still significant factors affecting the reliability of the test and thus included in this study. Lastly, errors related to confusing instructions were the least frequent, with only three errors identified.

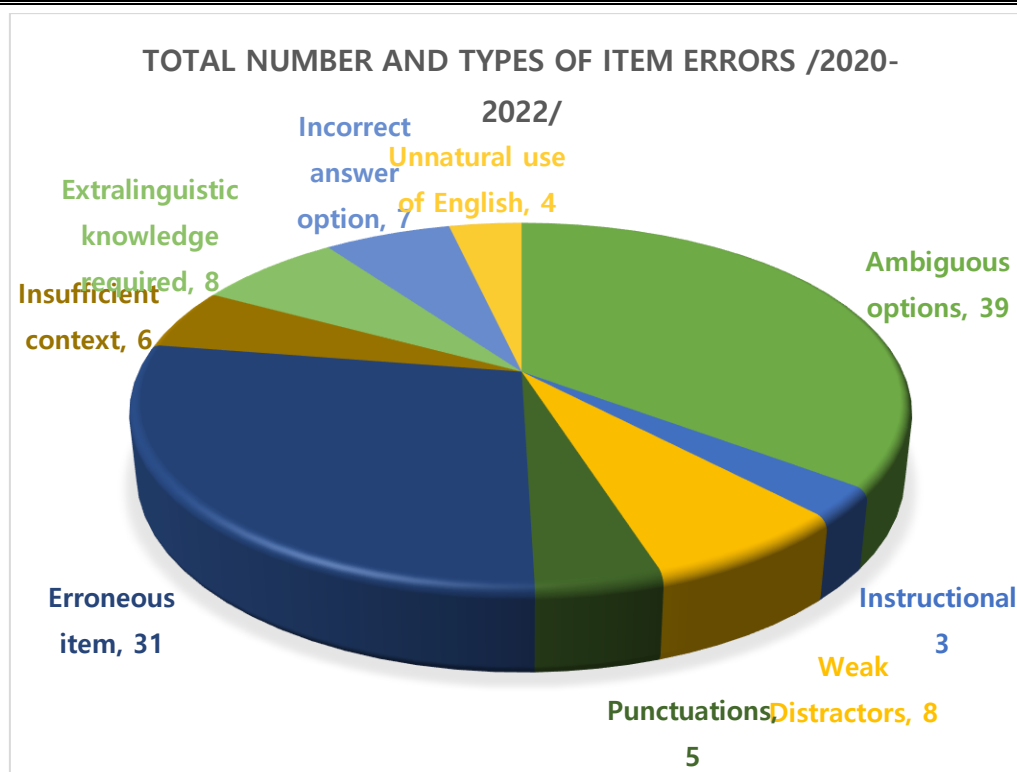


Figure 2. The number and types of test item errors 2020-2022

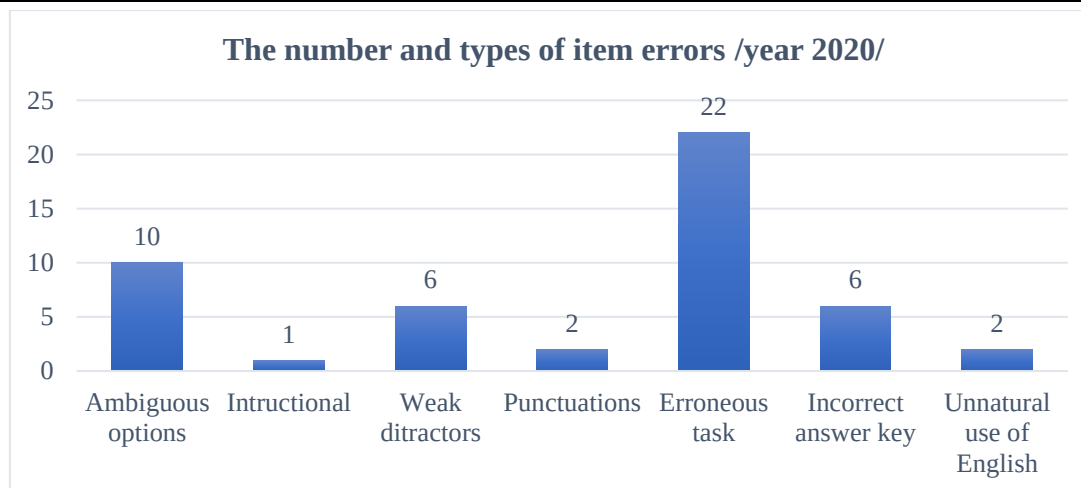
The above data are illustrated in the following table.

Table 2. The number and types of test item errors 2020-2022.

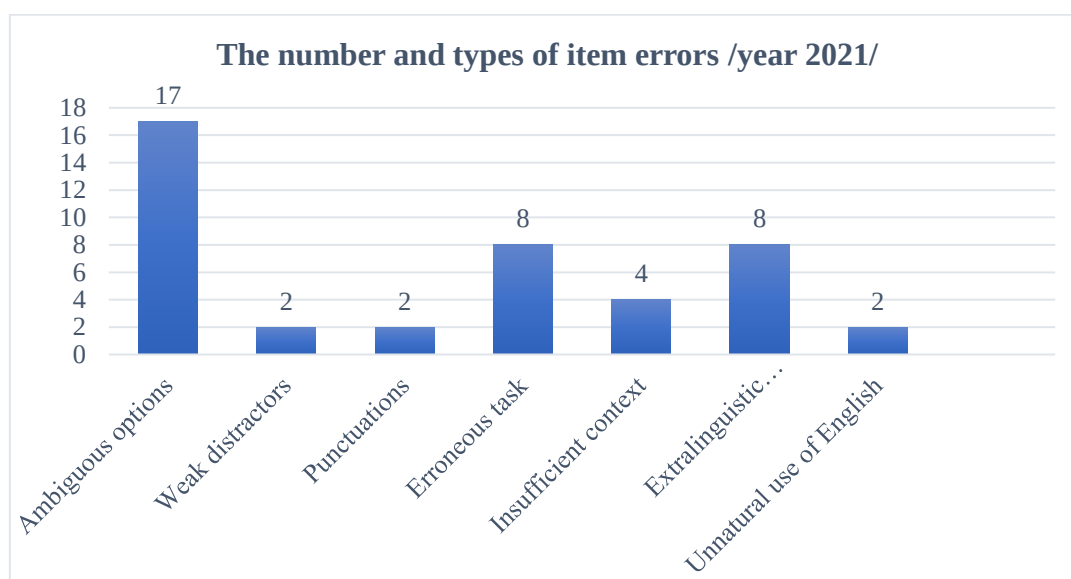
№	Error type	Number of errors
1	Ambiguous options	39
2	Erroneous item	31
3	Extralinguistic knowledge required	8
4	Weak distractors	8
5	Incorrect answer options	7
6	Insufficient context	6
7	Punctuations	5
8	Unnatural use of English	4
9	Confusing instruction	3
	Total	111

Note: The test items containing errors in variants A and B are repeated in variants C, D and E. hence, the errors are counted twice.

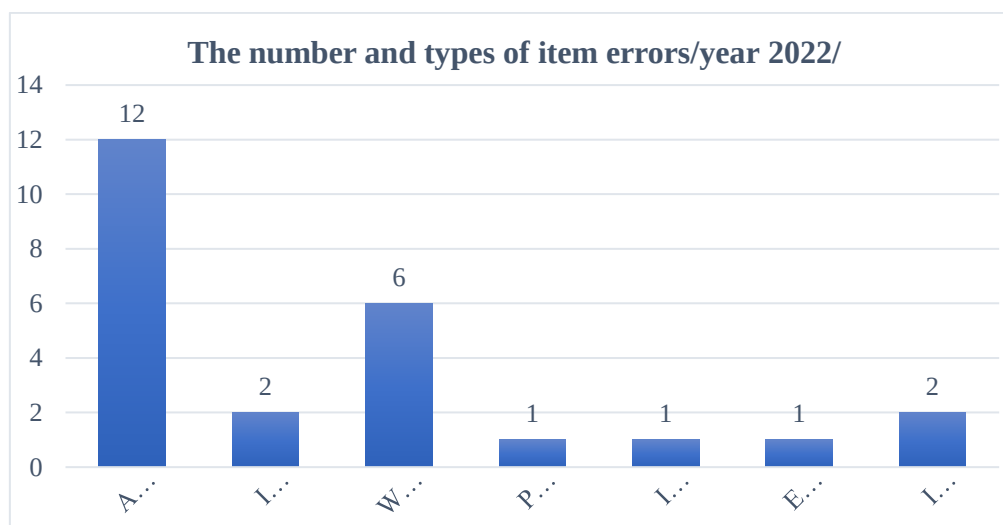
The numbers and types of errors presented in separate years:



[Figure 3]. The number and types of item errors in the year 2020



[Figure 4]. The number and types of item errors in the year 2021



[Figure 5] The number and types of item errors in the year 2022

5. Discussion

To focus our analysis on the most pertinent examples of item errors, we have chosen to provide one or two illustrative cases for each type of error, with the aim of highlighting how and why the GEE items fail to meet the principle of item reliability. While there are certainly many more examples of item errors that we could have included in this paper, we believe that the selected cases are representative of the broader problems that exist within the GEE materials.

I. Items with ambiguous options.

The weight of the item reliability takes up the errors due to the ambiguous options in the multiple choice questions. It proves that the test items were not carefully examined. Furthermore, it could be due to an exam developer who is not a native speaker as well as not specialized in language testing. To prove the point, the following example illustrates that when a question *May I use your phone?* is asked, one could either respond as *Go ahead* or *Feel free*. Although the correct answer was provided as *Feel free*, an option, *Go ahead* seems to be much more plausible option considering the authenticity of a language use.

Example 1.

Woman: Richard, may I use your phone? I think mine is out of order.

Man: _____

A. **Feel free** B. Take it easy C. So do I D. Go ahead E. Sounds great

(The item is the 35th item of Variants A & C, 2022 GEE)

Depending on the preference for the serving size, either 'a cup' or 'a mug' could be used to complete the sentence. Therefore, the following item has two possible correct answers.

Example 2.

Would you like _____ of tea?

A. a carton B. an ear C. a box **D. a cup** E. a mug

(The 2.2 item of Variant B, 2022 GEE)

II. Erroneous item

The next issue concerning the item reliability was due to the items containing grammatical errors thus raising a risk of being hard to comprehend by the test takers. The following item left out the preposition *by* after the verb *caused*. It was supposed to be '*caused by*'.

Example 3.

1. Depression is caused much reasons and what worries us is the children get depressed easily.

A B C D E
A. is **B. much** C. worries D. the
E. depressed

(The item is the 17th item of Variants B & D, 2021 GEE)

In test items in which test takers were expected to find one error, the erroneous item itself makes the item more challenging to the candidates. Hence, thorough proofreading is highly critical by experts before mass printing.

From the incidents like above, we can assume that such errors could have been made either due to carelessness or lack of language proficiency of the test developers.

III. Items requiring extralinguistic knowledge

The next set of issues that are related to both reliability and validity are those items which require extralinguistic knowledge in order to successfully pick the correct one. For instance, in order to answer the following question, a test taker needs to have some knowledge of a computer devices and parts. In other words, such a test item is not testing the language proficiency only, but also additional knowledge and skill is required to perform this task. This makes the test item unreliable as well as invalid as it did

not assess what it intended to assess. Another serious issue rising in relation to such items is, since the test is administered nationwide, there could be the test takers who have not had any previous experience of using a computer to the degree of knowing and distinguishing different particles of a computer; thus, making them vulnerable to approach such test items.

Example 4.

A device inside a computer that stores large amounts of information.

- A. Modem B. Word processor C. Disk drive
D. Spreadsheet E. **Hard disk**

(The item is the 29th item of Variants A & C, 2021 GEE)

IV. Weak distractors

Although the issues related to weak distractors are more of a topic of validity, weak distractors play an important role in making test items unreliable. For instance, in the example sentence 5, all the options have no connection with each other whatsoever, hence making the whole item unreliable. To make equally strong distractors, the options need to be close in meaning, part of speech or the length (Henning, 1989)

Example 5.

The heavy rain flooded the field, and the ground was muddy. Under these _____ the kids couldn't play.

- A. willingness B. basements C. decisions D. **circumstances** E. cells

(The item is the 26th item of Variants B & D, 2022 GEE)

V. Incorrect answer option

In this category, we included the test items which have answer keys that are incorrect. For instance, the according to the answer key, the so-called correct answer is an option A in the following item. Indeed, if you take a look at the item 47, an option E turns out to be the correct one. Such mistake can be made again due to carelessness or lack of professional native speakers.

Example 6.

One of the zoo's (46) principles is to keep a small number of species-only 50 mammals-but in larger (47) _____

- 47 A. **numbers** B. places C. symbols D. audiences E. areas

(The item is the 47th item of Variants A, 2022 GEE)

VI. Items with insufficient contexts

Due to insufficient contexts, some test items became highly ambiguous. In some cases, more than two options became potential correct answers as in the following examples. In example 7, since the place can be either a house or a store, I argue that all options could fit technically. In order to make the item more discriminable, the phrase 'of your houses' at least could be added so that option D can stand out more vividly.

Example 7.

There are a lot of _____ in this part of town, so always close the windows and lock the door.

- A. Shoplifters B. Robberies C. Thieves D. **Burglars** E. Muggers

(The item is the 22nd item of Variants A & D, 2021 GEE)

Another incident of an item which has three potential correct answers due to the insufficient context provision. In the following item, newspapers, adverts as well as magazines, all can contain interesting words and pictures about a new product. We can avoid it by providing more extensive context.

Example 8.

The young people like to read _____ with interesting words and pictures about a new product to make people buy it.

A. Newspapers B. Adverts C. Magazines D. Journals
E. papers
(The item is the 16th item of Variants B & C, 2021 GEE)

VII. Punctuation errors

In items presenting an adjective clause, the two commas are missing. Thus, it also makes the item erroneous and confusing. The correct version should be *The woman, _____ car is parked behind the house is, a doctor*. Once again, such error could be made due to carelessness or a lack of knowledge of an adjective clause structure.

Example 9.

The woman _____ car is parked behind the house is a doctor.

- A. whom B. who C. which D. that E. whose

(The item is the 6th item of Variants A & D, 2021 GEE)

Here, the similar mistake was made. But only one comma is missing after a word *house*.

Example 10.

The man, whose red car is parked in front off our house is a physician.

- A B C D
E
A. whose B. parked C. off D. our E. physician.

(The item is the 18th item of Variants B & C, 2020 GEE)

VIII. Unnatural use of English

One of the serious errors we observed is concerning the unnatural use of English thus making the item highly incomprehensible. In the following example, the sentence was supposed to be _____, *excessive use of the internet, is becoming a big issue*. With this error, the whole sentence does not make a complete sense.

Example 11.

_____, excessive use of the internet, is getting big issues.

- A. Gossiping B. Bullying C. Cyber addiction
D. Social media E. Feedback

(The item is the 28th item of Variants A & D, 2020 GEE)

To prove my point further, let us take another case. In the following item, travel was treated as a noun. Unfortunately, it cannot serve as a noun in English. It should either be formed as *traveling* or should take an attribute.

Example 12.

I'm really interested in travel to moon

- A. --- / a B. --- / the C. a / --- D. the / ---
E. a / the

(The item is the 8th item of Variants A & D, 2020 GEE)

The aforementioned errors could be made due to the poor knowledge of English and mainly made by non-native speakers. Therefore, it is highly crucial for the agency to collaborate with a professional native speakers to re-examine the test. When such a professional is absent, we can rely on the advanced technology such as ChatGPT.

IX. Confusing instruction

When it comes to a high-stake test, we should not only consider the reliability of test items, but also the instructions. Provided the instructions are ambiguous or unclear, it once again will cause a problem for the test takers. For instance, in the following item, the test takers might be confused whether they should chose only one answer or two options. Hence, the instructions should also be carefully tailored to be

easily and clearly understood.

Example 13.

Read the short conversations and choose the best answers.

(The item is the 37th item of Variants A & D, 2022 GEE)

Based on the abovementioned cases, we can conclude that we need a native-speaking expert in language testing. Alternatively, we can utilize cutting-edge technologies such as ChatGPT AI for the development of reliable test items. Another consideration to keep in mind is that we need to change gears and try to include as much a context as possible for each test item so that such ambiguity or insufficient context-related item issues could be avoided. Additionally, the education agency responsible for the test development needs to train their exam developers as well as experts in the fields of language testing and test development in-depth.

6. Conclusion

To answer to the research question, based on the findings, we can conclude that the General Entrance Exam items are not reliable. This is a serious issue as such a high-stake exam plays an important role for the further education and career of test takers.

In order to solve this item reliability issue, we can utilize the latest technology, ChatGPT AI for our advantage as it can provide human-like authentic responses in English retrieving from over 3 billion-word corpus as well as resources up until 2021. The use of such AI is particularly highly crucial for countries like us where English is taught as a foreign language and there are scarcity of native-speaking professionals. We reach a conclusion that ChatGPT can be a powerful tool and an assistant for test developers by providing authentic responses retrieving from a giant pool of resources.

This study limited its scope with only item reliability. In further study, there is a great need to investigate whether the GEE meets other language testing principles such as practicality, validity, authenticity as well as washback effect.

Finally, it is time to make a reform in GEE to test the candidates' overall linguistic competences rather than with discrete grammatical items and comprehension only reading passages. We should assess how learners are able to use the language, not about the language knowledge.

Appendix

Only to illustrate how ChatGPT AI was used to check the reliability issues of the test items, we provided only a handful samples in the following way.

Example 1.

The police discovered vital evidence _____ led to arrest of the thief.

A. which

B. where

C. when

D. that

E. who

ChatGPT response:

In this sentence, both "which" and "that" could be used, but "that" is more commonly used in this context.

"That" is a relative pronoun that is commonly used to introduce a restrictive clause, which is a clause that is necessary to the meaning of the sentence. In this sentence, the clause "that led to the arrest of the thief" is necessary to convey the meaning that the evidence was crucial in catching the thief.

Here's an example sentence using "that": "The police discovered vital evidence that led to the arrest of the thief."

On the other hand, "which" is typically used to introduce a non-restrictive clause, which is a clause that provides additional information but is not essential to the meaning of the sentence. An example sentence using "which" would be: "The police discovered vital evidence, which ultimately led to the arrest of the thief." In this case, the information provided by the clause "which ultimately led to the arrest of the thief" is not essential to the meaning of the sentence.

Example 2.

Would you like _____ of tea?

A. a carton B. an ear C. a box **D. a cup** E. a mug

ChatGPT response:

Either "a cup" or "a mug" could be used to complete the sentence, depending on your preference for the serving size of tea.

Traditionally, "a cup" is a smaller serving size for tea, while "a mug" is larger. However, the use of these terms can vary depending on the culture, location, and personal preference.

So, the sentence could be completed as: "Would you like a cup of tea?" or "Would you like a mug of tea?"

Example 3.

_____, excessive use of the internet, is getting big issues.

A. Gossiping

B. Bullying

C. Cyber addiction

D. Social media

E. Feedback

ChatGPT response:

Yes, there is a mistake in the sentence. It should be "is becoming a big issue" instead of "is getting big issues."

The corrected sentence is: "Cyber addiction, excessive use of the internet, is becoming a big issue."

Yes, there should be an article before "excessive use of the internet" to make the sentence grammatically correct.

It should be "Cyber addiction, the excessive use of the internet, is becoming a big issue."

Example 4.

I'm really interested in travel to moon

A. --- / a

B. --- / the

C. a / ---

D. the / ---

E. a / the

ChatGPT response:

Yes, there is a mistake. It should be "I'm really interested in traveling to the moon" or "I'm really interested in a trip to the moon."

References

- [1] Ankhbayar, J. (2021). Predicting college students' academic success based on the general entrance exam scores. *Pressing issues solutions in education*, 33-45.
- [2] Brown, D., & Abeywickrama, P. (2010). *Principles of language assessment. Language assessment: Principles and classroom practices.* (pp. 25-51). NY: Pearson Education.
- [3] Gonsalves, C. (2023). On ChatGPT: What promise remains for multiple choice assessment? *Journal of Learning Development in Higher Education*, 27, 1-10.
- [4] Hamid, M. O., Hoang, N. T. H., & Kirkpatrick, A. (2019). Language tests, linguistic gatekeeping and global mobility. *Current Issues in Language Planning*, 20(3), 226-244.
- [5] Henning, G. (1987). Item analysis: Item uniqueness, item guessing and item discrimination. In R. L. Linn (Ed.), *Educational measurement* (3rd ed., pp. 43-56). American Council on Education and Macmillan Publishing Company.
- [6] Education Evaluation Center. (2022). Report on General Entrance Examination – 2022. pp. 204-229
- [7] General entrance examination test: English. (2020). pp. 92-125.
- [8] General entrance examination test: English. (2021). pp. 128-159
- [9] General entrance examination test: English. (2022). pp. 162-196
- [10] <http://www.ielts.org>
- [11] <http://www.eec.mn>
- [12] <https://chat.openai.com/>

development

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Abstract: The importance and results of efficient use of state and local budgets and implementation of appropriate budget policies are measured by economic growth, social well being, results in the health and education sectors, and quality changes in citizens' lives. In this article, the impact of local government expenditure on human development was calculated using the non-parametric DEA (DEA—Data Envelopment Analysis) method of efficiency analysis on the example of the provinces of the Khangai region, and based on the results of the study, it was concluded that there is a possibility to reduce the inefficiency of local budget expenditure.

Keywords: local government expenditure efficiency, human development index; DEA; Malmquist-Index

SSBA-21

Organizational participation in human development

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Abstract: The basis of the success of any organization is directly related to the level of skills, specialization and development of the human resources of the organization. As the level of productivity, profit, and reputation of a company depends on the professional skills, productivity, organization, reputation, and personal development of its employees, companies today pay special attention to the issue of personal development and define the policy to be followed by the organization for the development of its employees. Published scholarly works such as Survey of Perceived Organization Support SPOS by Schauflei & Bakker in 1986, Utrecht Work Engagement Scale by J.Hellgren in 2003, Job Insecurity Scale by De Witte in 2000, and Methods for identifying cognitive and affective factors influencing workplace restlessness published in 2012 indicates that organizational participation has an important effect on employee development. In this research, we determined the participation and support of the organization and management in the personal development process of the employees and investigated what kind of support is more important.

Keywords: Individual development, Organizational participation in human development, Support, Relevance of organizational development to individual development

1. Introduction

Organizations require high productivity and quality results from employees, and employees need to constantly improve their professional and other skills in order to meet these requirements. In order to increase their skills, employees attend a variety of personal development courses and focus on self-development, but the participation of the organization and management in this process is very important. For example, some employees have inconvenient working hours, heavy work load, some employees lack financial resources to attend personal development training, some employees face problems that cannot be solved by themselves, such as geographical location and family problems, so they rely on the support and participation of the organization and ask for support from their management. events are common and there are varying degrees of support and involvement from organizational and management policies.

Basis of research: Although the personal development of the employee includes positive consequences related to the individual, such as the career growth of the employee, the growth of skills, the growth of the professional rank and the increase of the salary supply, the increase in the productivity and economic efficiency of the organization through the development of the employee also brings positive consequences to the organization. . For this reason, organizations focus on employee development and include opportunities for learning and development in their human resource policies. However, a part of the personal development of employees is to be confident in the stability of the workplace and the atmosphere of the community when working, and the colleagues and management knowing and

appreciating their contribution to the organization. will affect its stable operation in the future. There are research studies that examine organizational support from the perspective of incentives and monetary assistance, but there are few studies that consider the impact of non-monetary support on the development of employees. In the future, organizations consider it appropriate to determine the impact of non-monetary support on total support and to use the impact of non-monetary support as the basis of this research. We define the following objectives in this research:

Purpose: We aim to determine the level of participation of the organization in the personal development of employees and what kind of support employees want from the organization and management.

Objective: Within the scope of this research, we set the following objectives. These include:

1. Research the theory of organizational support
2. Determine the impact of the support provided by the organization on individual development
3. To determine the types of support provided by the organization for personal development of employees in the future

Impact of research: The results of this research determine the level of importance of cooperation between organizations and employees in the development of the individual and further in the development of the organization, and it is important for the organization to determine and plan its human resources policy by identifying which direction is more important for the organization to provide support to its employees.

Scope of research: In our research, we studied 113 employees of 3 organizations operating in Orkhon province.

Methodology of research: The research data and the types of support employees want from the organization were obtained using questionnaires, interviews, and document methods, and the Survey of Perceived Organizational Support (SPOS) was defined, and the results were processed using the SPSS method.

2. Theoretical research

Organizational support is the degree to which employees believe that the organization values their contributions, cares about their well-being, and meets their social and psychological needs. Organizational support is a positive dynamic relationship established with the organization's employees because they strive to perform better in response to rewards and positive relationships. According to Eisenberger R., Huntington R., Hutchinson S., and Sowa D.'s "Perceived organizational support" research, which is the first work on the theory of organizational support, organizational support increases employees' psychological attachment to their organization, and it is aligned with the organization's goals, resulting in positive outcomes. will result. (Perceived organizational support is assumed to increase the employee's affective attachment to the organization and his or her expectancy that greater effort toward meeting organizational goals will be rewarded) [1]

Also, researchers Eisenberger R. and Linda Rhoades found that issues related to work environment, positive attitude and behavior of employees, and loyalty, management support, rewards and favorable work environment are strongly related to organizational support. [2]

Researchers Eisenberger R., Huntington R., Hutchinson S., and Sowa D. in their research work "Perceived organizational support" included 361 employees and investigated employees' perception of organizational support with 36 questions on a 7-dimensional Likert scale. [1] In doing so, half of the 36 questions were taken as positive and half as negative, and the answers were offered as 1=strongly disagree and 7=strongly agree. A total of 361 employees of 9 organizations were included in the research. According to the results of the study, organizational support is a social exchange process, and

employees' trust in the organization's commitment to them has a positive impact on job performance and lower absenteeism. [1] B. Purevsuren, a researcher at MSU, has studied the effect of organizational support on employee satisfaction in the field of education. In his research work, he studied Eisenberg's 36-part question and Spector's 36-part question, and conducted a reliability analysis using SPSS 20 software. . As a result of the researcher's research, the members of any organization want their hard work from their organization not only for salary compensation, but also for internal psychological factors such as work environment, community relations, and motivation from the work they do, and these factors are related to their job satisfaction. It was concluded that when employees feel that the organization supports them, job satisfaction is high, but when they do not realize this, job dissatisfaction occurs. [3] Researcher of Saratov State University of Russia Smirnova A.Yu. The role of organizational support in employee development was based on empirical research on the reliability of Lynn McFarlane Shore and Lois E. Tetrick to determine the level of organizational support proposed by Eisenberger et al. In addition to reliability in the research work, Schaufeli and Bakker's method of measuring employee involvement with the Utrecht Employee Engagement Scale (The Utrecht Employee Engagement Scale) and subjective insecurity in the workplace proposed by D. Helgren (Methodology for diagnosing subjective insecurity in the world of work by D. Helgren) conducted a survey involving 680 employees using the measurement method. The results of the study suggest that a high level of organizational support plays an important role in increasing employee engagement and reducing subjectivity. [4]

Jody A. Worley, a researcher at the University of Oklahoma, USA; Dale R. Fuqua; and Chan M. Hellman (2009), "The survey of perceived organizational support: which measure should we use?" After evaluating the reliability of the SPOS research method with 36 types of questionnaires and simplified 16,8,3 birth questionnaires proposed by Eisenberger R. is no less than the 36 birth question method, but the 3 birth question method is considered to be the least reliable because it is oversimplified.

The researchers conducted a reliability analysis to examine the internal consistency reliability of the 36-factor SPOS. The overall reliability is very high with a coefficient of 36 items (Cronbach's alpha/Cronbach's α) $\alpha = 0.96$. Item-total correlations for the total scale ranged from 0.33 to 0.83. The mean and median item-total correlations were 0.63 and 0.65, respectively. In addition to 36 factors, reliability analysis was conducted for each of 16, 8, and 3 factors. Cronbach's alpha was $\alpha = 0.95$ for the 16 factors, and overall factor correlations ranged from 0.50 to 0.86. The mean and median factor-total correlations were 0.71 and 0.70, respectively. Cronbach's alpha for the 8 factors was $\alpha = 0.93$, with factor-total correlations ranging from 0.70 to 0.84. The mean and median factor-total correlations were 0.75 and 0.73, respectively. Cronbach's alpha $\alpha = 0.81$ for the 3 factors of the SPOS, with factor-total correlations ranging from 0.64 to 0.67. The mean and median factor correlations were 0.66 and 0.67, respectively.[5]

[Table 1] Correlations between the POS factor score and POS total scores (N = 266)

No		1	2	3	4	5	6	7
1	POS factor score	1.00						
2	POS 36 items	0.90	1.00					
3	POS 16 items	0.96	0.97	1.00				
4	POS 8 items	0.97	0.94	0.98	1.00			
5	POS 3 items	0.86	0.85	0.88	0.88	1.00		
6	Affective commitment	0.58	0.60	0.61	0.60	0.58	1.00	
7	Organizational participation	0.25	0.32	0.32	0.33	0.29	0.34	1.0
8	Organizational communication	0.58	0.60	0.60	0.56	0.54	0.54	0.29

All correlations are significant at $p < .00$

3. Methods

Jody A. Worley, a researcher at the University of Oklahoma, USA; Dale R. Fuqua; and Chan M. Hellman (2009), “The survey of perceived organizational support: which measure should we use?” In our research work, the Cronbach coefficient of reliability of the 8-factor questionnaire of organizational support (POS) is $\alpha = 0.93$, and the Cronbach coefficient of reliability of the 16-factor questionnaire is $\alpha = 0.95$, which means that they are not inferior to the 36-factor questionnaire in terms of reliability. Taking a simplified version of the 8-factor questionnaire, we surveyed 113 employees of 3 organizations in order to determine the role of organizational support in the development of employees, and to determine what types of support are important for employees.

4. Results, Data Analysis

We asked 113 employees of 3 organizations about the type of support provided by the organization and whether the support from the organization affects the personal development of the employee.

[Table 2] The number of employees in the organization surveyed for the POS factor

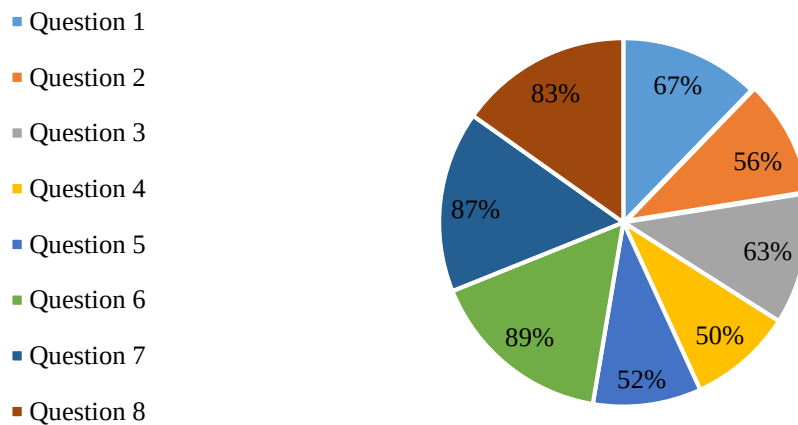
No	Organization	Number of employees participated	Percentage of total sample
1	Department of Gardening and Greenery	23	20.35%
2	Regional diagnostic and treatment center	56	49.55%
3	Bayan-Undur Med Hospital	34	30.1%
	Total	113	100%

Employees of the Department of Gardening and Greenery responded that the organization provides financial and material support rather than psychological support, and they help more with problems in their personal lives. This is due to the fact that the organization is a locally-owned organization, so the salary level of the employees is low, but the support given by the organization in the form of money is provided by the government in the form of allowances, food allowances, and when there is a need in the organization.

[Table 3] Responses to an 8-factor survey questionnaire (Department of Gardening and Greenery, N=23)

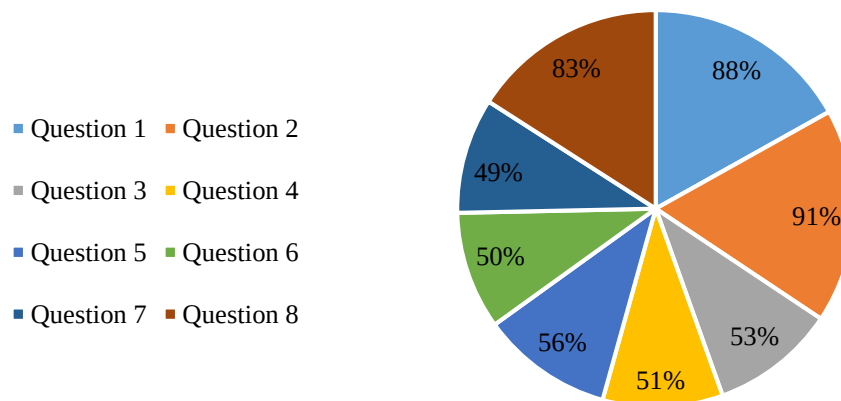
Question	Response rate
Employees' contributions are valued by the organization	65%
The organization supports the personal development of employees	32%
The organization supports the career growth of employees	29%
The organization supports the problems that arise in the personal life of the employee	81%
The organization prefers monetary and material support	100%
The organization prefers to provide psychological support	36%
The employee is interested in long-term stable work in the organization	49%
Organizational support helps to enjoy work and work productively	51%

Bayan-Undur Med Hospital is a private sector hospital, and the percentage of people who answered that the support provided to the employees is of a psychological nature is higher than the other 2 organizations. Organizational culture is closely related.



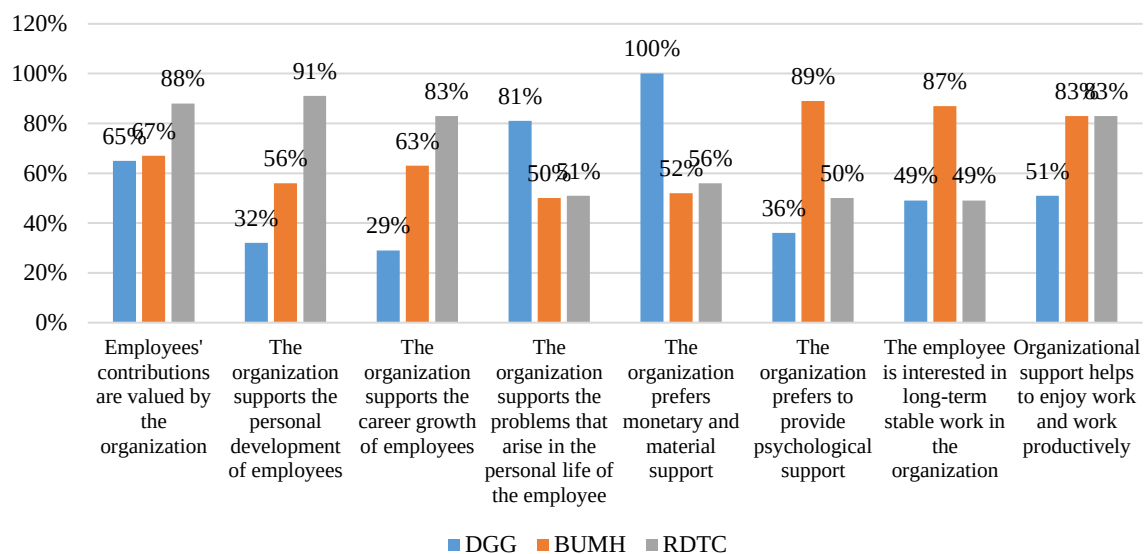
[Figure 1] Responses to an 8-factor survey questionnaire (Bayan-Undur Med Hospital N=34)

The employees of the regional diagnostic and treatment center gave the highest agreement to questions 1, 2 and 8. The support provided by the organization to the personal development of the employees is due to the internal training organized by the organization and the need to constantly improve their professional knowledge.



[Figure 2] 8 Responses to an 8-factor survey questionnaire (RDTC, N=56)

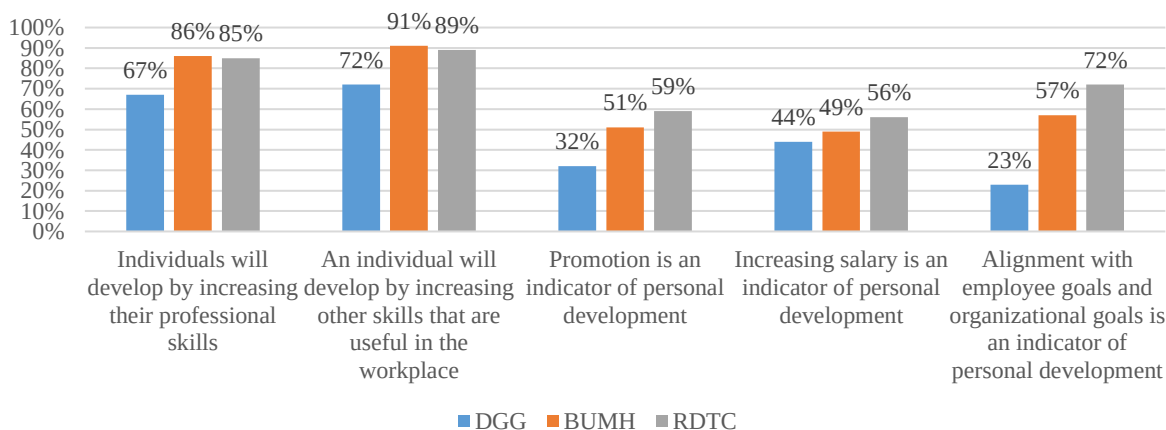
Participants from Bayan-Undur Medical Hospital said that they provide psychological support, while the other 2 organizations responded that they provide material and financial support. Also, in the case of Bayan-Ondur Med Hospital and BET, the answer that they support their employees to develop as individuals is more dominant.



[Figure 3] 8 Responses to an 8-factor survey questionnaire (DGG, BUMH, RDTC, N=113)

We asked employees of the organization about their understanding of personal development and what kind of support they need from the organization for personal development, and summarized the results as follows..

For employees of 3 organizations, 81.6% answered on average that increasing their professional and other skills defines personal development, while 48.5% agreed that promotion and salary increase are indicators of personal development. On the other hand, 50.6% of the employees believed that the alignment of the employee's goals with the organization's goals will determine personal development. Compared to the National Medical Center, the employees of Banya-Ondur Medical Hospital and Regional Diagnostic and Treatment Center believe that approaching organizational goals and personal goals is an indicator of personal development. is related. In addition, the staff of the National Board of Education and the Ministry of Education and Culture believe that improving professional and other skills will lead to personal development, career growth, and salary growth..



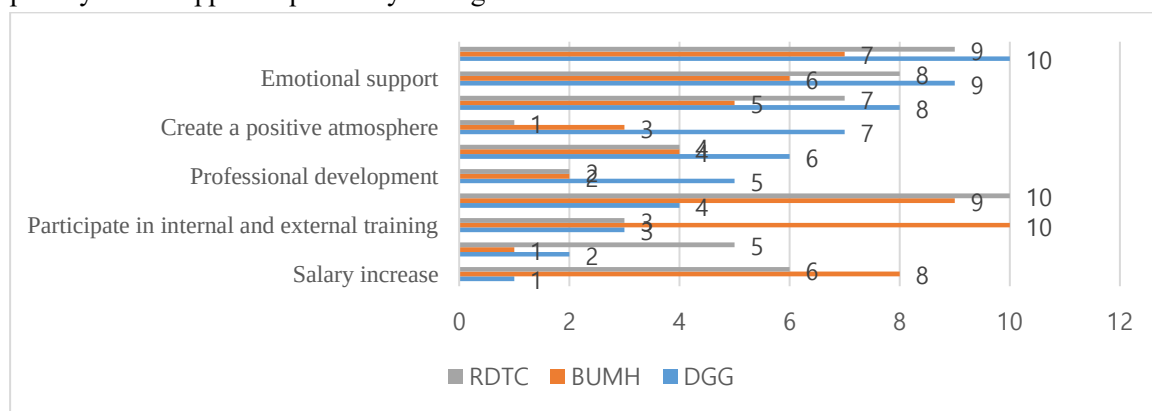
[Figure4] Answers describing the personal development of the employees of the organization (DGG, BUMH, RDTC, N=113)

Based on the results of the above study, Cronbach's $\alpha = 0.74$ was obtained, which indicates that the sample size of the study is sufficient, and the answers and results of the study are reliable or acceptable.

[Table 4] Reliability Statistics

Cronbach's Alpha	N of Items
.740	8

The third part of our research was the question of what kind of support they want from their organization, and 113 participants from 3 organizations answered as follows. Answers to the question were obtained by ranking the answer possibilities of the staff. According to the answers, creating a positive atmosphere among the employees of the organization for the employees of the RDTC, publicly praising and announcing their contribution to the organization for the employees of the BUMH, and salary increase for the DGG are the 1st priority of the support requested by the organization.



[Figure 5] The organization's employees prioritize the support they want from the organization (DGG, BUMH, RDTC, N=113)

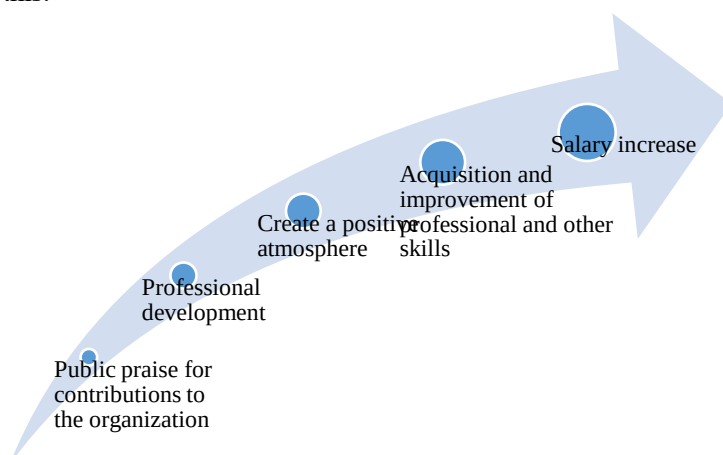
A comparative analysis of this result reveals the differences between each organization as follows. In the case of the employees of the DGG, the support of the organization supporting personal development should be monetary and material, while the employees of the BUMH gave more importance to the psychological support, while the employees of the RDTC said that the support should be both material and psychological. In this:

[Table 5] Differences in Organizational Employees' Ratings of Organizational Support

Types of support		DGG	BUMH	RDTC
Financial and material support	Salary increase	1	8	6
	Improvement of working environment	4	9	10
	Professional development	5	2	2
	Acquisition and improvement of professional and other skills	6	4	4
	Participate in internal and external training	3	10	3
	Public praise for contributions to the organization	2	1	5
Psychological support	Create a positive atmosphere	7	3	1
	Increase participation in decision-making	8	5	7
	Emotional support	9	6	8
	Organize informal interviews and meetings to listen to ideas	10	7	9

It can be seen from here that the support provided by the organization can be ranked as follows in order of

importance. In this:



[Figure 6] The importance of support that organizational employees seek from the organization

5. Discussion, Conclusion

Through this research, we surveyed 113 employees of 3 organizations about personal development, the support provided by the organization, and what kind of support employees want from the organization for their personal development. We have achieved the goals and objectives of our research work, and by improving the skills and knowledge of an individual, it is possible to increase income and career growth, but having a certain support from the organization has a positive effect on the productivity and efficiency of the organization. According to our research, employees are interested in receiving training fee support and additional incentives for better work, but the psychological supports such as long-term stable work in the organization, recognition as a full-fledged member of the organization, and letting others know that you have done a better job than others. It is seen that it has an important effect on the development of employees.

According to a survey conducted among 113 employees of 3 organizations, the psychological factors of being praised in public and working in a positive atmosphere are as important as developing by improving professional knowledge and skills, and receiving support from the organization will support individual development.

References

- [1] Eisenberger R., Huntington R., Hutchinson S., & Sowa D. (1986), "Perceived organizational support" *Journal of Applied Psychology*, № 71. P. 500–507.
- [2] Rhoades L., Eisenberger R. (2002), "Perceived Organizational Support: A Review of the Literature" *Journal of Applied Psychology*, № 87 (4). P. 698–714. [17].
- [3] B. Purevsuren. (2015), "Effecting Organizational Support on Job Satisfaction", *MUSIC Journal - Lavay Journal*, №13, x.194-201
- [4] Смирнова Анна Юрьевна. (2017), "Роль организационной поддержки в профессиональном развитии персонала", *Известия Саратовского Университета*, №5, с.142-145
- [5] Jody A. Worley; Dale R. Fuqua; Chan M. Hellman. (2009), "The survey of perceived organisational support: which measure should we use?" *SA Journal of Industrial Psychol*, №35. P. 112-116.
- [6] W. Schaufeli, Bakker A. (2003), "Utrecht Work Engagement Scale Preliminary Manual — Utrecht." : *Occupational Health Psychology Unit*;
- [7] Vroom, V.H. (1964), "Work ans motivation", *John Wiley and Sons*, New York, p.99

SSEC-22

Adaptability to climate change

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Abstract: Climate change increases environmental, social, economic, and demographic vulnerability and slows economic growth. In Mongolia, about 40% of the population pasturing livestock and non-irrigated farming, which further increases the risk. Therefore, a dynamic model was created to calculate the effects of climate change, make economic planning adapted to it, and estimate the effects of possible scenarios in advance. For this model, the simulation test period starts in 2000 and covers the period until 2040, which is based on the historical data and statistics of the previous 20 years to simulate the analysis of the general dynamics of the next 20 years. The system dynamics model of the economic planning considering adaptability to climate change is constructed with 20 sectors consisting of a system of ordinary differential equations, in which included a total of more than 1000 variable parameters to display main social, economic, and environmental indicators of the Sukhbaatar province and its sum's. The model was developed on Vensim software using the system dynamics modelling, and the Runge-Kutta 4th order numerical method was used to calculate the results of economic planning adapted to climate change at the levels of herder household, sum, and province.

Keywords: climate change, economic planning, test, simulation, system dynamic model

1. Introduction

The parliament of Mongolia approved the National Action Program on Climate Change (2011-2021) in order to fulfill its obligations under the United Nations Framework Convention on Climate Change in 2011. This program was aimed at reducing the effects of disasters on livestock, agriculture, water resources and forestry due to climate change, moreover contributing to the reduction of greenhouse gas emissions from industrial activities. The fact that biggest household income of the herders depends on meat and cashmere directly correlates to the excessive increase in the number of livestock. One of the main measures to adapt livestock production to the climate change is to limit population growth of livestock immediately and afterwards to reduce their numbers to sustainable level. Many herders follow the principle of profiting from a large population of livestock. This principle leads to great damage to the environment and the economy in the long run. In this article, we discuss about the effects of the one of the measures, which is a process of fattening lamb on pastures and supplementary feed to be slaughtered within a year to put in economic circulation, to reduce and adapt livestock production to climate change on the data collected from Bayandelger soum of Sukhbaatar province.

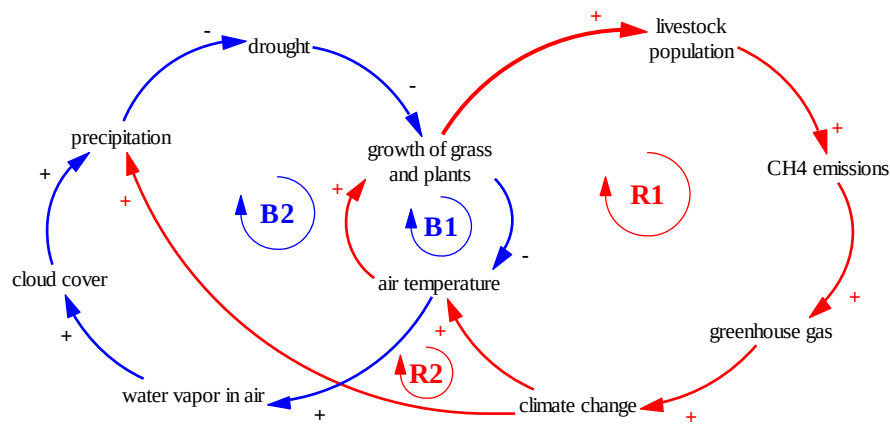
2. Methodology

System dynamics was introduced in 1958 by American scientist Forrester J.W to plan and control industry, urban planning, and the environment by dynamic models, and suggest alternative solutions by simulating the model [7]. The methodology was initially used only in industry, but now it is successfully applied to all aspects of organizational management, market growth, labor instability, public policy

design, economy and environmental research [6]. A model is an imitation of a real system and used when it is easier to work with the imitation. Sterman J.D defined system dynamics and simulation methods as ways to learn how complex systems behave under conditions that real experiments are too slow, too expensive, or have high ethical implications [5]. System dynamics models depend on three sources of information: numerical data, written databases (such as reports, user manuals, and so on) and knowledge of industry key players. In this study, system dynamic model was created using Vensim software. Vensim is a professional dynamic modeling program that calculates systems of ordinary differential equations with high precision numerical methods, such as Euler and Runge-Kutta, at each moment of time and displays the solution numerically and graphically. This system dynamics model can be served as a tool to look at the long- and medium-term outlook for economic planning affected by climate change factors, to promote policy formulation and decision-making.

3. System Dynamics Model

Climate change depends on the emission of greenhouse gases, which affects air temperature and precipitation, furthermore, these processes in turn affects negatively on society, economy, and the environment, as shown in the following causal loop diagram



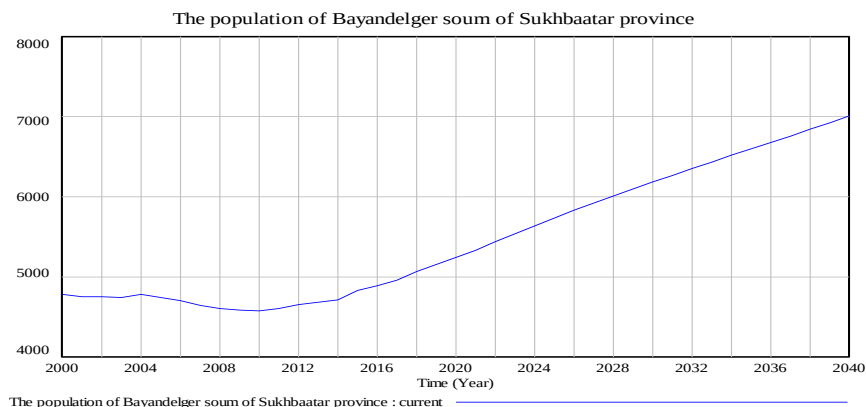
[Picture 1] Causal loop diagram

Development policy planning includes birth rates, death rates, and migration factors, because population size and growth rate have a significant impact on society and economy. Population increases with birth rates and decreases with death rates, and changes with net migration. Net migration is the difference between inflows and outflows. We applied Leslie model because we assumed that inflows and outflows of the migration are related to the economic potential (GDP) of the soums and Sukhbaatar province. The population can be seen in detail by age and gender in the model.

Population growth is calculated by $P(t) = P_0 e^{kt}$ exponential law with the equation of $\frac{dP}{dt} = kP$.

$$\frac{d(\text{Population})}{dt} = (\text{Birth rate} - \text{Death rate} + \text{Inflows} - \text{Outflows}) * \text{Population} \quad (1)$$

The future estimate of the population of Bayandelger soum of Sukhbaatar province is shown in the picture.

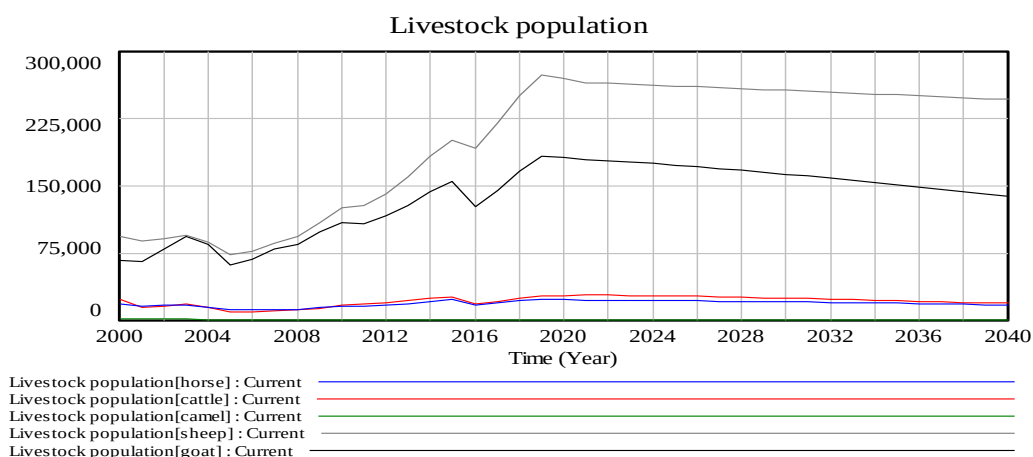


[Picture 2] Population

The logistic law with the equation $\frac{dP}{dt} = rP \left(\frac{K-P}{K} \right)$ is used to calculate the growth of livestock population and data is used from two sources, www.1212.mn website of national Statistics Office of Mongolia and Mongolian Statistical Yearbooks (2000 - 2021).

$$\text{Livestock pop} = (\text{Birth rate of pasturing livestock} - \text{Unproductive loss of livestock} - \text{Rate of livestock slaughtered for food}) * (1 - \text{Total pasturing livestock (sheep)} / \text{Grazing capacity}) \quad (2)$$

The graph shows the dynamics of the livestock in Bayandelger soum of Sukhbaatar province until 2040.



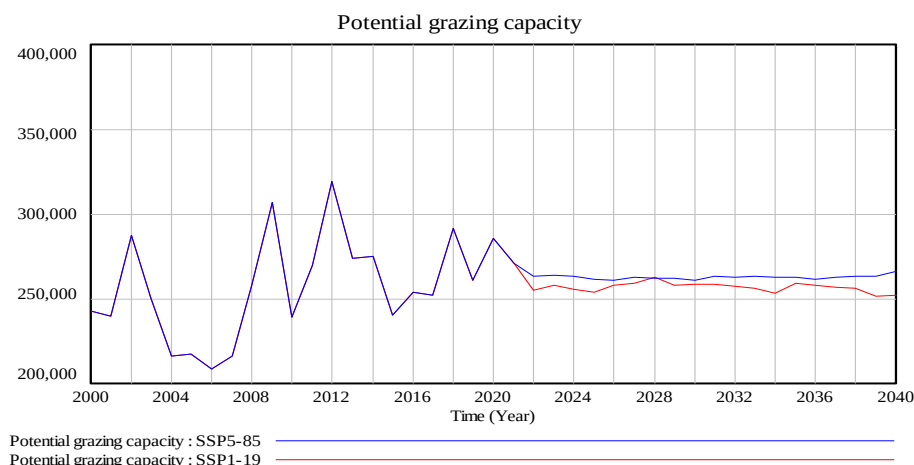
[Picture 3] Livestock population

The vegetation index is a base index that is used as a basis for deriving vegetation indices other than the vegetation-to-soil type index, which has been tested on a wide variety of species [4].

$$\text{Normalized Difference Vegetation index NDVI} = \frac{\text{Near infra-red NIR} - \text{RED}}{\text{Near infra-red NIR} + \text{RED}} \quad (3)$$

The correlation between the vegetation index (NDVI) and the average annual precipitation for the sums of Sukhbaatar Province was 0.58-0.78, and the R-squared was 0.35-0.6. However, the relationship with the average annual temperature was weak. However, the average temperature of the months and the amount of precipitation in summer and spring should be studied in detail. By deriving the perspective of the vegetation index, the actual yield of pastures until 2040 was calculated at the regional level, and the number of potential sheep was transferred each year [4].

$$\text{Biomass}(\text{steppe zone}) = 19.535e^{3.0232 \cdot \text{NDVI}} \quad (4)$$



[Picture 4] Grazing capacity

The cost and profit of the measure “increasing the production of lamb meat, decreasing the number of wintering lamb and reducing pasture degradation” were calculated in four scenarios, which are herder household sells lamb by fattening on pastures and supplementary feed, or sell them after a year starting from 2024.

Cost. The costs of adaptation measures include all additional costs incurred in the initiation and implementation of the measures. Therefore, the total cost consists of two main parts: investment cost and operating cost. Investment costs are not calculated as herder household is selling its own livestock. Operating costs include salary of herder’s salary expenses, labor protection expenses, supplementary feed expenses and other expenses. We calculated only supplementary feed expenses.

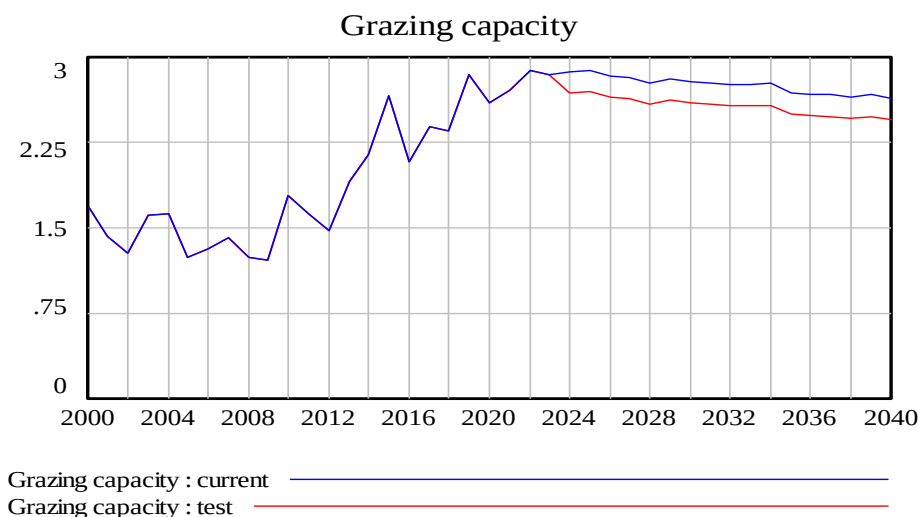
Profit. The profit includes all economic, environmental and social benefits of implementing the forementioned measures, such as economical, environmental, social and climate change adaptation profits. Economic profits include income from meat sales, return from the reduction of abnormal loss of livestock, and return from decrease of supplementary feed costs for yearlings in winter. Environmental profits include returns from improved grazing capacity and reduced water consumption due to the decrease of livestock population. Social profit includes social insurance of a herdsman, who will raise a lamb when it is bought by him, because social insurance will be paid when an additional job created. Climate change adaptation profits include return of reducing the amount of greenhouse gases (methane, nitrogen oxides) will be emitted by slaughtered lambs. The number of ram lamb for sale in 2024 is estimated to 46230 in Bayandelger soum. Mimo mineral is consisted of salt, saltpeter, silicate with unique structure, and carbonate mineral [3]

[Table 1] Outcome of cost and profit calculation

	Sell after a year	Lamb + pasture	Lamb + Pasture + rape cake	Lamb + pasture + rape cake +Mimo
Sales revenue/billion.tugrik/	5.85	4.17	4.88	6.53
Price of pasture grass/billion.tugrik/	7.92	1.73	1.73	1.73
Price of supplementary feed/million.tugrik/	186.58	0	858.25	995.69
Price of water/million.tugrik/	228.56	49.98	49.98	49.98
Cost of reducing greenhouse gases/million.tugrik/	45.53	17.7	17.7	17.7
COST PROFIT/billion.tugrik/	-2.53	2.37	2.22	3.73

According to the to today's trend, under "sell after a year" policy sales revenue is 5.85 billion tugrik but the cost and profit is -2.53 billion tugrik; and the sales revenue will reach 6.53 billion tugrik by implementing policy of fattening lamb on pastures, rape cake and mimo supplementary feed.

With the production of lamb meat, overgrazing would be 2.7 times in Bayandelger soum instead of estimated 2.9 times in 2024.



[Picture 6] Grazing capacity

4. Conclusion

Overgrazing and depreciation of pasture land have become the main reason for desertification and frequency increase of droughts in Mongolia, which has fragile and thin soil. As of today, the carrying capacity of pasture land has exceeded 3.5 times at Bayandelger soum of Sukhbaatar province and it is expected to increase further. We assumed that one possible option to reduce overgrazing is to slaughter lamb, and we developed a system dynamics model and simulated it. According to the results of the test, sales revenue is relatively high but the cost and profit is -2.53 billion MNT. When implementing policy of "fattening lamb on pastures and sell", sales revenue will not reach this level, but the cost and profit will be +2.37 billion MNT. However, the sales revenue, cost and profit could reach highest by implementing policy of "fattening lamb on pastures, rape cake and mimo supplementary fee." Lamb production will reduce overgrazing from 2.9 times to 2.7 in 2024, and it is possible to reduce overgrazing further. We need to look at the long term when implementing a development policy instead of being content on a small amount of money earned today.

References

- [1] D.Badarch, B.Ochirbat, B.Enkh-Amgalan , (2003), "System Dynamics Modeling", UB.
- [2] National Statistics Office of Mongolia website,(2022), www.1212.mn.
- [3] Mineral premix, (2022), www.mimo.mn
- [4] Guidelines for the monitoring of grasslands by remote sensing, (2022), UB.
- [5] [John D. Sterman](#), (2000), Systems Thinking and Modeling for a Complex World
- [6] D.H.Meadows, (1972), "The Limits to Growth", New-York.
- [7] J.W.Forrester, (1958), "Industrial Dynamics-A Major Breakthrough for Decision Makers.", in: Harvard Business Review, Vol. 36, No. 4, pp. 37–66.

OTFM-23

Plant-based diet and coronary heart disease risk in Korean adults: A prospective cohort study based on the Health Examinees (HEXA) Study

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Abstract: Prior studies have reported that plant-based diets are associated with a lower risk of coronary heart disease (CHD). However, limited information regarding the effects of plant-based diets on CHD risk in the Asian Population. This study explores the prospective association of three plant-based diet indices with CHD risk among Korean adults, using the Framingham risk score.

A total of 42,481 participants (12,249 men and 30,232 women) from the Health Examinees Study (HEXA) were included in the final analysis. Dietary intakes were estimated using a validated food frequency questionnaire (FFQ). We measured three plant-based diet indices (overall plant-based diet index (PDI), healthful plant-diet index (hPDI), and unhealthy plant-diet index (uPDI)). We used Cox proportional hazard models to estimate the hazard ratios (HRs) and 95% confidence intervals (CIs) for the CHD risk in a 10-year period).

Women with the highest quintile compared with the lowest quintile of PDI and hPDI had a lower risk of 10-year CHD (PDI: HR 0.390; 95% CI: 0.196-0.776; hPDI: HR 0.430; 95% CI 0.218-0.845), and uPDI had a higher risk of 10-year CHD (HR 2.407; 95% CI: 1.046–5.542,). However, we did not find such a significant association for men.

A higher intake of PDI and hPDI diets rich in healthy plant foods is associated with a lower risk of CHD, whereas unhealthy plant-based diets are associated with a higher risk of CHD in Korean women.

Keywords: Plant-based diet indices, Coronary heart disease, Framingham risk score, Health Examinees Study, Korean Adults

1. Introduction

Coronary heart disease (CHD) is the major cause of cardiovascular deaths worldwide. According to the World Health Organization (WHO), an estimated 17.9 million people died from various cardiovascular diseases (CVDs) in 2019, accounting for 32% of deaths globally [1, 2]. Cancer, heart disease, and pneumonia were the leading top 3 causes of death in Korea, responsible for 43.1% of the total deaths in 2021 in the country [3]. The increased risk of CHD is a related factor such as hypertension, diabetes, obesity, dyslipidemia family history, and smoking, most of which are influenced by lifestyle factors[4].

Diet is the prevention and reduction of CHD, it is recommended to increase the intake of fruit, and vegetables, and reduce the foods containing saturated fat and cholesterol [5]. A healthy diet and lifestyle are the prevention of CHD, and prior studies have a high consumption of plant-based diets decreased

lipid levels[6]. It is claimed that plant-based diets are associated with a lower risk of CHD [7-9]. A plant-based diet consists of a lower intake of animal foods and a higher intake of plant foods [10, 11]. However, not all plant-based foods are healthy. Plant foods such as refined grains, potatoes, and sugar-sweetened beverages are associated with a higher risk of chronic diseases and hence are less healthy [12, 13].

The following are some recently developed plant-based diet indices: an overall plant-based diet index (PDI), a healthful plant-based diet index (hPDI), and an unhealthy plant-based diet index (uPDI). Previous observational studies that investigated the Western diet mainly focused on PDI or hPDI because they are associated with a lower risk of chronic diseases in the Western population. The PDI and hPDI emphasize a high intake of healthy plant foods (whole grains, fruits, vegetables, nuts, legumes, tea, and coffee) and a limited intake of less healthy foods and animal foods. They are associated with a lower risk of CVDs, type 2 diabetes (T2D), less weight gain, and chronic kidney diseases[7, 12, 14, 15]. Conversely, the uPDI, which indicates a low intake of healthy plant foods and a higher intake of less healthy plant foods and animal foods, are positively associated with these chronic diseases [12-14].

In addition, few studies investigated the association between plant-based diet indices and CHD in the Asian population. The Korean diet comprises a higher intake of vegetables and grains and a lower intake of meat, in contrast to the Western diet which comprises different food groups and elicits different metabolic responses [16, 17]. Therefore, the present study prospectively evaluates associations between different types of plant-based diet indices (PDI, hPDI, and uPDI) and the risk of CHD in a large community-based cohort of Korean adults.

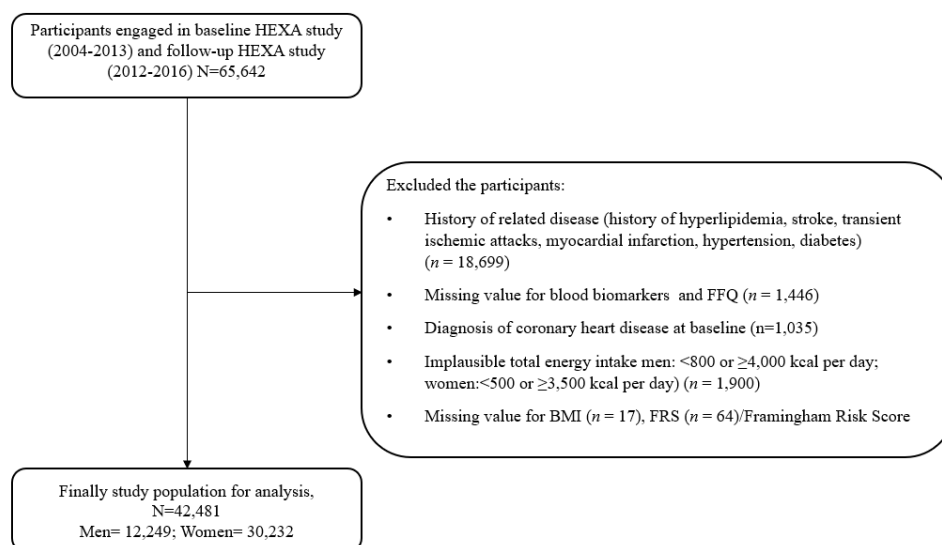
2. Methods

2.1 Study population

The HEXA is a large-scale genomic prospective cohort study conducted in Korea. The baseline survey for the HEXA study was conducted from 2004 to 2013. In total, 173,357 participants aged between 40 and 79 years were enrolled in 38 general hospitals and health examination centers at eight regions in Korea [18, 19]. Of these, 65,642 participants completed the initial and follow-up between 2012 and 2016. Participants with hyperlipidemia, stroke, transient ischemic attacks, myocardial infarction, hypertension, and diabetes at baseline ($n = 18,699$) were excluded. Further, we excluded those with a missing values for blood biomarker or food frequency questionnaire (FFQ) data ($n = 1,446$); diagnosed of coronary heart disease (CHD) at baseline ($n=1,035$); implausible energy intake (<800 or $\geq 4,000$ kcal/day in men and <500 or $\geq 3,500$ kcal/day in women) ($n = 1,900$), and missing information about the body mass index (BMI) ($n = 17$) and Framingham risk score (FRS) ($n = 64$). Finally, 42,481 participants (12,249 men and 30,232 women) were included in this study (**Figure 1**).

2.2 Dietary assessment and plant-based diet indices

Information about the dietary intake of the participants was collected using a semi-quantitative FFQ and included 106 food items. We determined the cumulative average dietary intake from the baseline and at follow-up FFQs. The following FFQ were used: (i) never or seldom, (ii) once a month, (iii) two to three times a month, (iv) once or twice a week, (v) three to four times a week, (vi) five to six times a week, (vii) once a day, (viii) twice a day, and (ix) three times a day. The portion size of each food was classified into small, medium, and large.



[Figure 1] The flow chart of the study population. HEXA, Health Examinees; FFQ, Food frequency questionnaire; CHD, coronary heart disease, BMI, body mass index; FRS, Framingham Risk Score.

We measured three plant-based diet indices: PDI, hPDI, and uPDI. Their modified versions were used in previous studies for calculating the plant-based diet indices [7, 14, 20]. Briefly, all food items were categorized into 17 food groups based on nutrients and culinary similarities, within the following three larger groups: healthy plant foods (whole grains, fruits, vegetables, nuts, legumes, tea, and coffee), less healthy plant foods (refined grains, potatoes, sugar-sweetened beverages, sweets and desserts, and salty plant foods), and animal foods (animal fat, dairy, eggs, fish or seafood, meat, and miscellaneous animal foods). In this study, salty foods (kimchi and pickled vegetables) were also added while classifying the 17 food groups. Previous studies had included vegetable oil and fruit juices. However, we did not include vegetable oils as an individual food group, because the FFQ did not consider vegetable oil consumption. It was included in the FFQ on the consumption of fruits and fruit juices asked together.

After calculating the energy-adjusted consumption of each of the 17 food groups, the consumption was ranked into quintiles. We assigned positive or reverse scores to each of the 17 food groups. For the positive scores, participants in the highest quintile of the food group scored 5, while those in the lowest quintile scored 1. With reverse scores, participants in the lowest quintile of the food group were scored 5, and those in the highest quintile were scored 1. For the overall PDI, positive scores were given to plant food groups and reverse scores to animal food groups. For the hPDI, only the healthy food groups were given a positive score, while less healthy plant food groups and animal food groups were given reverse scores. Finally, for the uPDI, less healthy plant food groups were assigned positive scores, while the healthy plant food groups and animal food groups were assigned reverse scores. We summed up the scores of the 17 food groups individually and divided them into quintiles for the analysis.

2.3 Ascertainment of coronary heart disease

CHD was identified using the Framingham Risk Score (FRS). The FRS total score was calculated using factors such as the age, smoking status, diabetic status, blood pressure, total blood cholesterol, and blood HDL-cholesterol. We also analyzed the 10-year risk defined as $FRS \geq 20\%$ [21].

$$\text{➤ } L_{Chol_{men}} = 0.04826 \times \text{age} - 0.65945 \text{ (if cholesterol } < 160) + 0.0 \text{ (if cholesterol } 160 -$$

199) + 0.17692 (if cholesterol 200–239) + 0.50539 (if cholesterol 240–279) + 0.65713 (if cholesterol ≥ 280) + 0.49744 (if HDL-C <35) + 0.24310 (if HDL-C 35–44) + 0.0 (if HDL-C 45–49) - 0.05107 (if HDL-C 50–59) - 0.48660 (if HDL-C ≥ 60) - 0.00226 (if blood pressure [BP] optimal) + 0.0 (if BP normal) + 0.28320 (if BP high normal) + 0.52168 (if BP stage I hypertension) + 0.61859 (if BP stage II hypertension) + 0.42839 (if diabetes present) + 0.0 (if diabetes not present) + 0.52337 (if smoker) + 0.0 (if not smoker).

- $L\_Chol_{women} = 0.33766 \times \text{age} - 0.00268 \times \text{age}^2$ (if cholesterol <160) + 0.0 (if cholesterol 160–199) + 0.20771 (if cholesterol 200–239) + 0.24385 (if cholesterol 240–279) + 0.53513 (if cholesterol ≥ 280) + 0.84312 (if HDL-C <35) + 0.37796 (if HDL-C 35–44) + 0.19785 (if HDL-C 45–49) + 0 (if HDL-C 50–59) - 0.42951 (if HDL-C ≥ 60) - 0.53363 (if blood pressure [BP] optimal) + 0.0 (if BP normal) - 0.06733 (if BP high normal) + 0.26288 (if BP stage I hypertension) + 0.46573 (if BP stage II hypertension) + 0.59626 (if diabetes present) + 0.0 (if diabetes not present) + 0.29246 (if smoker) + 0.0 (if not smoker).

2.4 Assessment of covariates

The baseline data included socio-demographic characteristics such as age, sex, education level (under middle school, high school and over college), and lifestyle factors. BMI values were used to divided participants into four groups: underweight (BMI<18.5kg/m²), normal weight (BMI $\geq$ 18.5kg/m² to <23kg/m²), overweight (BMI $\geq$ 23kg/m² to <25kg/m²), and obese (BMI $\geq$ 25kg/m²). The participants were also placed in the following two categories based on their alcohol intake: current drinker and non-drinker. Based on their smoking status, the participants were classified as never smoker (never smoked cigarettes), past smoker (abstained from cigarette smoking), and current smoker (cigarettes smoked at the time). In addition, they were grouped into the following two groups based on into physical activity: active (exercised ≥ 30 min once a day ≥ 5 times a week) or inactive (did not exercise at all).

2.5 Statistical analysis

All data analyses to assign the association between the consumption of plant-based diet and the CHD risk were stratified according to sex. We examined baseline characteristics and lifestyle factors according to the plant-based diet indices using a general linear model for continuous variables and chi-square test for categorical variables. Next, we determined the nutrient intake and food group quintiles using the diet indices. We measured the macronutrients as the percentage of total energy. We determined hazard ratios (HRs) and 95% confidence intervals (CIs) for the associations between plant-based diet indices and CHD risk using multivariable Cox proportional hazard models. We adjusted for age in Model 1. In Model 2, we adjusted for the education level, smoking status, alcohol consumption, physical activity, energy intake. All data analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC, USA) and $P < 0.05$ was considered statistically significant for two-sided tests.

3. Results

During the median 4.3-year follow-up 2085 participants developed a CHD. In men, the PDI, hPDI, and uPDI ranged from 32 to 70, 28 to 77, and 28 to 75, respectively, while in women, they ranged from 29 to 73, 27 to 78, and 28 to 78, respectively. The general characteristics of the participants at baseline in accordance with the quintiles of the plant-based diet indices and sex are listed in **Table 1**. Irrespective of the sex, participants with the highest quintiles of PDI and hPDI are more likely to be 50 to 59 years old, non-drinkers, never smokers, and more physically active than those the lowest quintiles (all $P <$

.0001). In contrast, those in the highest quintiles of uPDI are more likely to be older, have a lower education level, non-drinker, current smokers, and physically inactive, compare with those in lowest group.

Table 2 lists the nutrient and food intake of the participants according to the quintile of different types of plant-based diet indices. The participants in the highest quintiles of all plant-based diet indices had a higher intake of carbohydrates and a lower intake of protein and cholesterol. Participants in the highest quintile of PDI and hPDI consumed more fiber, while those in the highest quintile of uPDI had less fiber intake than those in the lowest quintile.

Furthermore, individuals in the food group intake quintiles of PDI consumed higher amounts of whole grains, fruits, vegetables, nuts, legumes, tea and coffee, potatoes, sugar-sweetened beverages, sweets, desserts, and salty plant foods and fewer amounts of refined grains, animal fat, eggs, meat, and miscellaneous animal foods. Individuals in the quintiles of hPDI consumed higher amounts of whole grains, fruits, vegetables, legumes, nuts, tea, and coffee, but less amounts of refined grains, potatoes, sugar-sweetened beverages, sweets, desserts, salty plant foods, and all animal food groups. Individuals in the quintiles of uPDI consumed fewer amounts of whole grains, fruits, vegetables, nuts, legumes, tea, coffee, potatoes, sugar-sweetened beverages, sweets, desserts, and salty plant foods, and all animal food groups and a higher intake of refined grains.

Table 1] General characteristics of the study population at baseline examination in accordance with the quintiles of plant-based diet indices by sex.

	PDI				hPDI				uPDI			
	Q1	Q3	Q5	P-value	Q1	Q3	Q5	P-value	Q1	Q3	Q5	P-value
Men												
N	2799	2758	3038		2956	2247	2498		2946	2883	2618	
Age (years), n (%)	52.5 ± 8.4	53.5 ± 8.4	54.7 ± 8.2	<.0001	50.0 ± 8.2	53.9 ± 8.2	56.6 ± 7.6	<.0001	53.4 ± 8.1	53.3 ± 8.5	54.2 ± 8.6	<.0001
40–49	1095(39.1)	958(34.7)	892(29.4)	<.0001	1570(53.1)	712(31.7)	470(18.8)	<.0001	980(33.3)	1031(35.8)	847(32.4)	<.0001
50–59	1038(37.1)	1078(39.1)	1189(39.1)		919(31.1)	908(40.4)	1062(42.5)		1214(41.2)	1080(37.5)	954(36.4)	
60–69	623(22.3)	670(24.3)	891(29.3)		438(14.8)	586(26.1)	909(36.4)		707(24.0)	714(24.8)	768(29.3)	
70–79	43(1.5)	52(1.9)	66(2.2)		29(1.0)	41(1.8)	57(2.3)		45(1.5)	58(2.0)	49(1.9)	
Education level, n (%)												
Under middle school	615(22.2)	557(20.4)	556(18.5)	<.0001	493(16.8)	452(20.4)	522(21.2)	<.0001	333(11.4)	558(19.6)	844(32.6)	<.0001
High school	1141(41.2)	1091(40.0)	1177(39.1)		1234(42.0)	899(40.5)	933(37.8)		1126(38.5)	1179(41.4)	1058(40.9)	
Over college	1015(36.6)	1078(39.6)	1275(42.4)		1211(41.2)	867(39.1)	1013(41.1)		1463(50.1)	1114(39.1)	685(26.5)	
BMI (kg/m ²)	24.1 ± 2.7	24.0 ± 2.6	24.1 ± 2.6	0.0314	24.3 ± 2.7	24.2 ± 2.6	23.8 ± 2.5	<.0001	24.3 ± 2.6	24.1 ± 2.6	23.8 ± 2.7	<.0001
Obesity, n (%)												
Underweight	44(1.6)	41(1.5)	42(1.4)	0.6073	38(1.3)	31(1.4)	49(2.0)	<.0001	22(0.8)	41(1.4)	57(2.2)	<.0001
Normal	1763(63.0)	1763(63.9)	1939(63.8)		1809(61.2)	1411(62.8)	1656(66.3)		1832(62.2)	1817(63.0)	1714(65.5)	
Overweight	937(33.5)	917(33.3)	997(32.8)		1027(34.7)	767(34.1)	771(30.9)		1034(35.1)	973(33.8)	809(30.9)	
Obese	55(2.0)	37(1.3)	60(2.0)		82(2.8)	38(1.7)	22(0.9)		58(2.0)	52(1.8)	38(1.5)	
Alcohol intake, n (%)												
Non-drinker	622(22.3)	741(27.0)	976(32.2)	<.0001	678(23.0)	601(26.9)	783(31.4)	<.0001	679(23.1)	760(26.4)	834(31.9)	<.0001
Current drinker	2168(77.7)	2008(73.0)	2056(67.8)		2269(77.0)	1637(73.4)	1708(68.6)		2258(76.9)	2115(73.6)	1777(68.1)	
Smoking status												
Never smoker	752(26.9)	890(32.3)	1054(34.8)	<.0001	767(26.0)	715(31.9)	924(37.1)	<.0001	939(32.0)	905(31.5)	774(29.6)	<.0001
Past smoker	1003(35.9)	1091(39.6)	1302(43.0)		971(32.9)	881(39.3)	1129(45.3)		1270(43.3)	1112(38.7)	963(36.9)	
Current smoker	1036(37.1)	773(28.1)	674(22.2)		1210(41.0)	646(28.8)	439(17.6)		726(24.7)	859(29.9)	876(33.5)	
Physical activity												
Active	876(32.2)	1013(37.7)	1279(43.7)	<.0001	864(30.0)	834(38.3)	1090(45.3)	<.0001	1382(48.8)	1004(35.9)	672(26.3)	<.0001
Inactive	1847(67.8)	1673(62.3)	1647(56.3)		2021(70.1)	1345(61.7)	1316(54.7)		1451(51.2)	1796(64.1)	1885(73.7)	
Women												

N	6545	6401	6879		6701	6700	5875		5676	5048	5765	
Age (years), n (%)	50.8 ± 7.6	51.4 ± 7.4	51.8 ± 6.9	<.0001	48.7 ± 7.0	51.7 ± 7.2	53.4 ± 6.9	<.0001	50.7 ± 6.9	51.1 ± 7.3	52.7 ± 7.7	<.0001
40–49	3027(46.3)	2686(42.0)	2641(38.4)	<.0001	3871(57.8)	2696(40.2)	1749(29.8)	<.0001	2544(44.8)	2194(43.5)	2083(36.1)	<.0001
50–59	2546(39.0)	2747(42.9)	3200(46.5)		2245(33.5)	2955(44.1)	2905(49.5)		2454(43.2)	2143(42.5)	2469(42.8)	
60–69	930(14.2)	926(14.5)	1013(14.7)		564(8.4)	1013(15.1)	1181(20.1)		669(11.8)	694(13.8)	1155(20.0)	
70–79	42(0.6)	42(0.7)	25(0.4)		21(0.3)	36(0.5)	40(0.7)		9(0.2)	17(0.3)	58(1.0)	
Education level, n (%)												
Under middle school	2042(31.6)	2105(33.2)	2125(31.3)	0.0326	1461(22.1)	2206(33.3)	2287(39.4)	<.0001	987(17.6)	1499(30.1)	2847(50.0)	<.0001
High school	2987(46.2)	2880(45.4)	3247(47.8)		3303(49.9)	3059(46.1)	2532(43.6)		2861(50.9)	2399(48.2)	2162(38.0)	
Over college	1438(22.2)	1354(21.4)	1422(20.9)		1860(28.1)	1366(20.6)	987(17.0)		1776(31.6)	1082(21.7)	686(12.1)	
BMI (kg/m ²)	23.1 ± 2.8	23.3 ± 2.9	23.4 ± 2.7	<.0001	23.2 ± 2.9	23.3 ± 2.7	23.3 ± 2.7	0.0268	23.1 ± 2.6	23.3 ± 2.8	23.4 ± 2.9	<.0001
Obesity, n (%)												
Underweight	186(2.8)	177(2.8)	120(1.7)	<.0001	188(2.8)	129(1.9)	131(2.2)	0.0037	125(2.2)	130(2.6)	170(3.0)	<.0001
Normal	4900(74.9)	4681(73.1)	5094(74.1)		4939(73.7)	4991(74.5)	4378(74.5)		4380(77.2)	3735(74.0)	4105(71.2)	
Overweight	1351(20.6)	1402(21.9)	1534(22.3)		1416(21.1)	1451(21.7)	1268(21.6)		1097(19.3)	1079(21.4)	1357(23.5)	
Obese	108(1.7)	141(2.2)	131(1.9)		158(2.4)	129(1.9)	98(1.7)		74(1.3)	104(2.1)	133(2.3)	
Alcohol intake, n (%)												
Non-drinker	4214(64.6)	4362(68.4)	4905(71.7)	<.0001	4136(61.9)	4530(67.9)	4461(76.3)	<.0001	3729(66.0)	3386(67.3)	4162(72.5)	<.0001
Current drinker	2307(35.4)	2013(31.6)	941(28.4)		2545(38.1)	2146(32.1)	1384(23.7)		1924(34.0)	1648(32.7)	1579(27.5)	
Smoking status												
Never smoker	6273(96.3)	6204(97.2)	6706(98.1)	<.0001	6437(96.6)	6479(97.2)	5753(98.4)	<.0001	5511(97.5)	4899(97.4)	5576(97.2)	0.0278
Past smoker	80(1.2)	68(1.1)	58(0.9)		84(1.3)	68(1.0)	41(0.7)		66(1.2)	47(0.9)	47(0.8)	
Current smoker	163(2.5)	109(1.7)	72(1.1)		146(2.2)	121(1.8)	51(0.9)		78(1.4)	83(1.7)	116(2.0)	
Physical activity												
Active	2205(34.3)	2414(38.6)	2938(44.0)	<.0001	2023(30.8)	2507(38.5)	2620(45.6)	<.0001	2666(48.5)	1890(38.3)	1609(28.4)	<.0001
Inactive	4221(65.7)	3836(61.4)	3741(56.0)		4539(69.2)	4005(61.5)	3132(54.5)		2827(51.5)	3044(61.7)	4061(71.6)	

PDI, overall plant-based diet index; hPDI, healthful plant-diet index; uPDI, unhealthful plant-diet index. Q, quintile ^aValues are expressed as mean ± SD or n (%); P-values < 0.05 were calculated using a generalized linear model for continuous variables, and chi-square test for categorical variables. ^bBody mass index divided into 4 groups (underweight, BMI < 18.5 kg/m²; normal, BMI ≥ 18.5 – < 23 kg/m²; overweight, BMI ≥ 23 – < 25 kg/m²; obese, BMI ≥ 25 kg/m². ^cSmoking status: never smoker (never smoked cigarettes), past smoker (smoked > 400 cigarettes in the past but abstained from cigarette smoking), and current smoker (cigarettes smoked at the time or has smoked > 400 cigarettes). ^dAlcohol intake: current drinker and non-drinker. ^ePhysical activity active: (exercised ≥ 30 min once a day) or inactive (did not exercise at all).

[Table 2] Nutrient and food intake of participants according to the quintiles of different plant-based diet indices by sex.

	PDI				hPDI				uPDI			
	Q1	Q3	Q5	P-value	Q1	Q3	Q5	P-value	Q1	Q3	Q5	P-value
Men												
Total energy intake (kcal/d)	1697.68 ± 420.5	1843.2 ± 454.5	2010.8 ± 494.1	<0.0001	2049.0 ± 513.3	1853.0 ± 450.1	1666.1 ± 372.5	<0.0001	2117.5 ± 478.7	1840.7 ± 437.5	1593.8 ± 387.3	<0.0001
Protein (g/d)	57.1 ± 20.4	61.9 ± 21.5	67.9 ± 23.2	<0.0001	72.5 ± 24.6	62.4 ± 20.8	52.8 ± 16.8	<0.0001	77.5 ± 23.5	61.3 ± 19.5	47.6 ± 15.3	<0.0001
Carbohydrate (g/d)	294.2 ± 68.8	325.8 ± 74.5	361.3 ± 82.8	<0.0001	343.3 ± 83.5	328.2 ± 79.4	311.1 ± 68.2	<0.0001	360.2 ± 80.9	326.1 ± 76.2	296.3 ± 69.5	<0.0001
Fat (g/d)	29.5 ± 15.51	30.0 ± 15.4	31.0 ± 15.5	<0.0001	40.6 ± 17.4	29.9 ± 13.6	20.9 ± 10.5	<0.0001	39.1 ± 16.4	29.9 ± 14.3	21.2 ± 11.7	<0.0001
Carbohydrates from energy (%)	71.0 ± 7.9	72.2 ± 6.9	73.0 ± 6.3	<0.0001	68.2 ± 6.8	72.0 ± 6.6	76.0 ± 6.0	<0.0001	68.9 ± 6.6	72.1 ± 6.7	76.1 ± 6.3	<0.0001
Protein from energy (%)	13.5 ± 2.6	13.5 ± 2.3	13.5 ± 2.3	0.0099	14.2 ± 2.4	13.5 ± 2.4	12.8 ± 2.2	<0.0001	14.7 ± 2.4	13.4 ± 2.3	12.1 ± 2.0	<0.0001
Fat from energy (%)	15.4 ± 5.7	14.3 ± 5.0	13.5 ± 4.5	<0.0001	17.7 ± 4.9	14.4 ± 4.6	11.2 ± 4.2	<0.0001	16.4 ± 4.7	14.5 ± 4.9	11.8 ± 4.7	<0.0001
Cholesterol (mg/day)	175.9 ± 109.6	154.2 ± 80.6	137.6 ± 69.8	<0.0001	185.0 ± 90.4	158.2 ± 85.2	124.3 ± 84.4	<0.0001	186.0 ± 87.2	155.5 ± 85.5	115.7 ± 78.6	<0.0001
Sodium (mg/d)	2095.9 ± 1032.6	2489.1 ± 1161.6	2804.4 ± 1167.6	<0.0001	2604.6 ±	2490.0 ± 1193.6	2291.1 ± 1188.1	<0.0001	2401.8 ± 1045.7	2468.4 ± 1175.6	2551.5 ± 1348.9	<0.0001
Fiber (g/d)	4.2 ± 1.5	5.3 ± 1.76	6.4 ± 2.1	<0.0001	1096.5	5.4 ± 2.0	5.7 ± 2.1	<0.0001	5.7 ± 1.9	5.3 ± 2.0	5.0 ± 2.0	<0.0001
Food Group intake (g/d)												
Whole grains	411.2 ± 313.6	471.8 ± 313.2	532.5 ± 297.7	<0.0001	303.3 ± 326.5	488.8 ± 304.1	613.2 ± 201.1	<0.0001	589.9 ± 238.5	476.3 ± 308.2	310.2 ± 333.5	<0.0001
Fruits	90.7 ± 94.2	147.2 ± 136.7	221.5 ± 188.1	<0.0001	131.8 ± 125.7	149.4 ± 145.3	179.7 ± 176.6	<0.0001	225.2 ± 182.3	144.5 ± 139.7	83.3 ± 89.7	<0.0001
Vegetables	92.0 ± 71.5	134.9 ± 95.3	195.7 ± 140.4	<0.0001	138.5 ± 109.0	142.0 ± 120.1	143.4 ± 110.8	0.2764	200.6 ± 135.4	135.6 ± 107.0	84.2 ± 75.7	<0.0001
Nuts	0.7 ± 2.1	1.3 ± 3.2	2.1 ± 4.3	<0.0001	1.1 ± 2.8	1.4 ± 3.0	1.7 ± 4.1	<0.0001	2.5 ± 4.5	1.2 ± 3.0	0.5 ± 2.1	<0.0001
Legumes	21.7 ± 37.2	33.7 ± 43.0	49.1 ± 57.1	<0.0001	33.7 ± 40.0	34.3 ± 48.0	37.1 ± 49.8	0.0404	53.6 ± 61.4	31.9 ± 41.5	18.3 ± 27.5	<0.0001
Tea & Coffee	27.9 ± 65.0	56.7 ± 93.2	92.4 ± 115.2	<0.0001	48.9 ± 87.7	61.9 ± 98.4	74.2 ± 109.1	<0.0001	95.0 ± 111.2	53.3 ± 92.7	27.8 ± 64.6	<0.0001
Refined grains	279.2 ± 317.9	251.1 ± 307.3	218.1 ± 286.7	<0.0001	443.6 ± 348.9	233.8 ± 287.9	79.8 ± 147.8	<0.0001	142.9 ± 199.5	243.0 ± 306.3	411.3 ± 359.7	<0.0001
Potatoes	3.4 ± 4.5	5.9 ± 7.9	9.6 ± 11.5	<0.0001	8.0 ± 9.2	6.1 ± 7.4	4.6 ± 7.4	<0.0001	7.1 ± 9.0	6.3 ± 9.1	5.2 ± 8.5	<0.0001
Sugar-sweetened beverages	20.0 ± 52.9	35.4 ± 69.9	53.2 ± 84.7	<0.0001	58.4 ± 93.1	34.7 ± 65.6	18.7 ± 50.8	<0.0001	37.3 ± 70.8	37.0 ± 73.8	33.0 ± 76.7	0.0703
Sweets and Desserts	12.0 ± 15.1	13.8 ± 16.8	16.0 ± 17.6	<0.0001	21.9 ± 19.7	13.8 ± 16.5	6.8 ± 9.3	<0.0001	14.9 ± 15.9	14.6 ± 16.6	12.6 ± 16.1	<0.0001
Salty plant foods	113.8 ± 86.3	163.5 ± 120.3	211.6 ± 139.2	<0.0001	184.8 ± 129.7	166.8 ± 129.9	138.5 ± 108.6	<0.0001	168.2 ± 129.2	164.2 ± 125.3	159.4 ± 122.7	0.0031
Animal fat	4.7 ± 4.5	4.3 ± 4.5	3.6 ± 4.2	<0.0001	6.3 ± 4.7	4.2 ± 4.3	2.1 ± 3.2	<0.0001	4.6 ± 4.5	4.5 ± 4.5	3.6 ± 4.2	<0.0001
Dairy	99.4 ± 113.2	99.8 ± 121.9	101.5 ± 127.1	0.3145	126.8 ± 124.0	101.0 ± 116.5	81.1 ± 119.1	<0.0001	161.6 ± 144.9	96.0 ± 110.1	50.5 ± 84.8	<0.0001
Eggs	13.2 ± 16.8	12.2 ± 14.1	11.0 ± 13.5	<0.0001	16.5 ± 17.3	12.1 ± 14.4	8.4 ± 13.2	<0.0001	17.8 ± 18.0	11.6 ± 13.6	6.7 ± 10.1	<0.0001
Fish or Seafood	36.1 ± 32.3	40.2 ± 35.7	46.6 ± 41.8	<0.0001	49.0 ± 39.9	41.9 ± 36.6	32.3 ± 31.9	<0.0001	60.1 ± 44.5	39.1 ± 33.6	23.2 ± 24.2	<0.0001

Meat	63.0 ± 58.8	58.3 ± 50.4	53.0 ± 48.7	<0.0001	84.5 ± 63.3	56.4 ± 47.9	33.6 ± 31.7	<0.0001	75.4 ± 57.8	57.8 ± 52.2	38.2 ± 39.6	<0.0001
Miscellaneous animal Foods	7.5 ± 12.2	6.5 ± 12.1	5.2 ± 10.7	<0.0001	12.6 ± 16.9	6.0 ± 10.5	2.0 ± 5.9	<0.0001	9.3 ± 14.3	6.7 ± 12.4	3.4 ± 8.3	<0.0001
Women												
Total energy intake (kcal/d)	1492.2 ± 439.3	1687.9 ± 464.6	1900.2 ± 497.3	<0.0001	1889.0 ± 532.8	1669.8 ± 467.4	1536.1 ± 408.5	<0.0001	2007.7 ± 497.7	1690.2 ± 443.5	1406.7 ± 392.3	<0.0001
Protein (g/d)	50.6 ± 19.3	57.3 ± 21.5	64.3 ± 22.5	<0.0001	67.2 ± 23.9	56.4 ± 20.6	48.6 ± 16.9	<0.0001	74.5 ± 23.5	56.6 ± 18.1	42.1 ± 13.8	<0.0001
Carbohydrate (g/d)	261.4 ± 75.2	301.2 ± 78.4	345.8 ± 86.5	<0.0001	320.2 ± 89.6	300.2 ± 84.4	290.5 ± 78.2	<0.0001	342.6 ± 86.3	303.7 ± 82.0	265.9 ± 75.0	<0.0001
Fat (g/d)	25.0 ± 14.0	26.6 ± 14.7	28.1 ± 14.8	<0.0001	36.3 ± 16.7	25.5 ± 12.4	18.3 ± 9.8	<0.0001	37.0 ± 15.7	26.1 ± 12.8	17.2 ± 9.8	<0.0001
Carbohydrates from energy (%)	71.4 ± 7.9	72.6 ± 7.2	73.6 ± 6.5	<0.0001	68.6 ± 6.9	72.8 ± 6.7	76.5 ± 6.3	<0.0001	68.7 ± 6.7	72.6 ± 6.9	76.8 ± 6.2	<0.0001
Protein from energy (%)	13.7 ± 2.6	13.6 ± 2.5	13.5 ± 2.4	0.0002	14.3 ± 2.4	13.6 ± 2.5	12.7 ± 2.3	<0.0001	14.9 ± 2.5	13.5 ± 2.3	12.2 ± 2.0	<0.0001
Fat from energy (%)	14.9 ± 5.7	13.8 ± 5.2	13.0 ± 4.6	<0.0001	17.1 ± 5.1	13.7 ± 4.7	10.7 ± 4.4	<0.0001	16.5 ± 4.8	13.9 ± 5.1	11.0 ± 4.7	<0.0001
Cholesterol (mg/day)	196.4 ± 120.6	171.4 ± 96.7	150.5 ± 84.8	<0.0001	202.6 ± 97.1	172.6 ± 102.7	134.3 ± 96.4	<0.0001	208.0 ± 99.1	171.7 ± 98.4	131.7 ± 90.1	<0.0001
Sodium (mg/d)	2130.1 ± 1132.6	2474.7 ± 1215.0	2817.1 ± 1262.5	<0.0001	2597.5 ± 1138.3	2479.3 ± 1244.2	2271.7 ± 1264.3	<0.0001	2357.2 ± 984.7	2479.2 ± 1222.7	2609.8 ± 1490.1	<0.0001
Fiber (g/d)	4.9 ± 1.8	5.9 ± 2.0	7.1 ± 2.3	<0.0001	5.5 ± 1.9	6.0 ± 2.2	6.3 ± 2.5	<0.0001	6.3 ± 2.1	5.9 ± 2.2	5.7 ± 2.3	<0.0001
Food Group intake (g/d)												
Whole grains	399.8 ± 261.5	461.0 ± 260.3	513.8 ± 250.8	<0.0001	345.4 ± 290.8	477.6 ± 249.8	552.4 ± 197.6	<0.0001	537.7 ± 201.9	477.4 ± 253.3	339.1 ± 296.6	<0.0001
Fruits	137.3 ± 138.5	206.8 ± 191.5	293.8 ± 237.2	<0.0001	186.9 ± 174.1	209.9 ± 193.3	239.7 ± 215.6	<0.0001	311.6 ± 240.1	204.9 ± 186.2	128.3 ± 130.4	<0.0001
Vegetables	107.8 ± 83.7	160.6 ± 121.5	235.1 ± 170.5	<0.0001	165.1 ± 129.8	164.3 ± 131.0	170.1 ± 147.3	0.1347	244.7 ± 167.5	161.7 ± 121.6	100.6 ± 79.9	<0.0001
Nuts	0.9 ± 2.4	1.5 ± 3.2	2.6 ± 4.8	<0.0001	1.4 ± 3.0	1.6 ± 3.7	2.0 ± 4.4	<0.0001	3.3 ± 5.4	1.4 ± 2.9	0.6 ± 1.8	<0.0001
Legumes	20.3 ± 29.0	34.7 ± 48.5	52.2 ± 59.8	<0.0001	33.7 ± 44.6	35.6 ± 49.1	38.6 ± 55.8	<0.0001	58.9 ± 65.2	33.4 ± 44.3	17.7 ± 26.2	<0.0001
Tea & Coffee	25.8 ± 62.5	49.9 ± 89.9	81.7 ± 111.9	<0.0001	44.6 ± 83.2	52.9 ± 92.7	59.7 ± 104.2	<0.0001	87.4 ± 114.2	49.3 ± 89.1	22.3 ± 56.2	<0.0001
Refined grains	168.3 ± 246.4	157.6 ± 232.2	144.5 ± 210.4	<0.0001	293.1 ± 290.6	134.9 ± 203.9	51.0 ± 104.5	<0.0001	94.5 ± 132.7	142.6 ± 220.0	265.2 ± 305.0	<0.0001
Potatoes	4.0 ± 5.5	7.1 ± 9.6	11.9 ± 14.8	<0.0001	9.5 ± 11.6	7.6 ± 10.7	5.3 ± 9.1	<0.0001	8.4 ± 12.1	7.6 ± 10.4	6.5 ± 9.5	<0.0001
Sugar-sweetened beverages	15.6 ± 46.4	28.1 ± 63.5	50.0 ± 89.0	<0.0001	48.6 ± 88.7	28.5 ± 63.9	16.8 ± 47.1	<0.0001	33.2 ± 72.2	31.4 ± 66.0	26.9 ± 65.4	<0.0001
Sweets and Desserts	10.6 ± 15.0	12.5 ± 17.1	14.8 ± 19.8	<0.0001	21.7 ± 22.7	11.5 ± 15.3	5.0 ± 7.8	<0.0001	14.0 ± 18.4	13.0 ± 16.5	10.9 ± 16.7	<0.0001

Salty plant foods	96.0 ± 80.4	138.7 ± 104.2	189.4 ± 128.7	<0.0001	160.0 ± 112.4	139.7 ± 109.5	119.6 ± 104.6	<0.0001	142.7 ± 109.9	143.6 ± 115.2	139.1 ± 113.1	0.0425
Animal fat	3.3 ± 3.8	2.8 ± 3.6	2.3 ± 3.3	<0.0001	4.5 ± 4.0	2.7 ± 3.4	1.0 ± 2.2	<0.0001	3.2 ± 3.6	2.8 ± 3.6	2.3 ± 3.4	<0.0001
Dairy	131.1 ± 140.0	130.6 ± 145.2	131.0 ± 149.0	0.6246	150.7 ± 144.4	130.9 ± 144.9	108.1 ± 138.6	<0.0001	202.1 ± 163.9	124.4 ± 134.3	68.3 ± 95.4	<0.0001
Eggs	12.3 ± 14.5	12.3 ± 13.9	12.0 ± 15.6	0.6503	16.7 ± 15.9	11.9 ± 14.5	8.0 ± 12.4	<0.0001	19.2 ± 18.2	11.8 ± 13.8	6.5 ± 9.5	<0.0001
Fish or Seafood	34.8 ± 32.0	40.4 ± 39.7	46.0 ± 41.4	<0.0001	48.9 ± 40.0	40.3 ± 38.2	30.7 ± 30.7	<0.0001	60.7 ± 45.2	38.5 ± 33.4	22.9 ± 21.5	<0.0001
Meat	45.1 ± 44.6	43.3 ± 42.7	37.8 ± 39.9	<0.0001	65.4 ± 51.5	39.3 ± 36.9	23.0 ± 26.7	<0.0001	60.6 ± 50.1	41.4 ± 40.4	25.5 ± 28.3	<0.0001
Miscellaneous animal foods	7.7 ± 15.2	6.4 ± 13.0	5.3 ± 12.9	<0.0001	13.1 ± 20.0	5.4 ± 10.9	1.8 ± 6.7	<0.0001	9.8 ± 16.2	6.6 ± 14.9	3.3 ± 9.1	<0.0001

PDI, overall plant-based diet index; hPDI, healthful plant-based diet index; uPDI, unhealthful plant-based diet index; Q, quintile

^aValues are expressed as mean±SD or *n* (%); *P*-values were calculated using a generalized linear model

[Table 3] Hazard ratios and 95% confidence intervals for coronary heart disease on plant-based diet indices by sex

	PDI					Ptrend
	Q1	Q2	Q3	Q4	Q5	
Men (n=12,249)						
Person-years, mean(sum)	4.9(12470.6)	5(11236.6)	5(12490.1)	5(11090.5)	5(13572.2)	
median range	44(32 - 46)	48(47 - 49)	51(50 - 52)	54(53 - 55)	58(56 - 71)	
case, n	401	362	395	380	464	
Model 1	ref (1.00)	0.933(0.761 - 1.143)	0.676(0.547 - 0.836)	0.721(0.583 - 0.892)	0.691(0.565 - 0.845)	<0.0001
Model 2	ref (1.00)	1.047(0.852 - 1.287)	0.865(0.697 - 1.073)	0.890(0.716 - 1.105)	0.991(0.803 - 1.224)	0.528
hPDI						
Person-years, mean(sum)	4.9(13027.9)	4.9(11666.5)	5(10080)	5(14762.2)	5.1(11323.4)	
median range	42(28 - 45)	48(46 - 49)	51(50 - 52)	55(53 - 57)	60(58 - 77)	
case, n	352	329	347	554	420	
Model 1	ref (1.00)	0.933(0.750 - 1.160)	0.77(0.614 - 0.967)	0.767(0.626 - 0.940)	0.63(0.506 - 0.786)	<0.0001
Model 2	ref (1.00)	1.112(0.893 - 1.384)	1.013(0.806 - 1.274)	0.978(0.795 - 1.204)	0.946(0.753 - 1.187)	0.4139
uPDI						
Person-years, mean(sum)	4.9(14545.8)	4.9(13223.7)	5(14336.4)	5(12522.3)	5.1(13320.2)	

median range	43(28 - 45)	48(46 - 49)	52(50 - 53)	55(54 - 57)	61(58 - 75)	
case, n	417	397	312	466	430	
Model 1	ref (1.00)	1.029(0.822 - 1.288)	1.091(0.881 - 1.351)	1.246(1.003 - 1.549)	1.291(1.050 - 1.587)	0.0042
Model 2	ref (1.00)	1.007(0.803 - 1.263)	0.964(0.774 - 1.200)	1.094(0.869 - 1.378)	1.076(0.855 - 1.354)	0.4362
Women (n=30,232)						
PDI						
Person-years, mean(sum)	4.9(31398.2)	5(27543.8)	5(31141.2)	5.1(28071.4)	5.2(34337.7)	
median range	44(29 - 46)	48(47 - 49)	51(50 - 52)	54(53 - 55)	58(56 - 73)	
case, n	21	13	16	14	19	
Model 1	ref (1.00)	0.801(0.432 - 1.484)	0.698(0.380 - 1.28)	0.64(0.332 - 1.231)	0.481(0.250 - 0.927)	0.0217
Model 2	ref (1.00)	0.754(0.405 - 1.403)	0.639(0.345 - 1.183)	0.552(0.282 - 1.082)	0.39(0.196 - 0.776)	0.0048
hPDI						
Person-years, mean(sum)	4.9(31731.6)	5(29703.2)	5.1(32989.1)	5.1(29265.7)	5.1(28802.7)	
median range	42(27 - 45)	48(46 - 49)	52(50 - 53)	55(54 - 57)	60(58 - 78)	
case, n	15	18	20	15	15	
Model 1	ref (1.00)	0.514(0.274 - 0.965)	0.450(0.245 - 0.827)	0.367(0.190 - 0.708)	0.36(0.189 - 0.685)	0.0007
Model 2	ref (1.00)	0.539(0.286 - 1.016)	0.493(0.264 - 0.919)	0.403(0.205 - 0.792)	0.430(0.218 - 0.845)	0.0067
uPDI						
Person-years, mean(sum)	5.1(28838.7)	5(37925.4)	5.1(25593.0)	5(36079.8)	5.1(29133.0)	
median range	42(28 - 44)	47(45 - 49)	51(50 - 52)	55(53 - 57)	61(58 - 78)	
case, n	8	17	11	25	22	
Model 1	ref (1.00)	1.369(0.614 - 3.054)	1.431(0.618 - 3.312)	1.455(0.664 - 3.185)	1.777(0.826 - 3.822)	0.1478
Model 2	ref (1.00)	1.485(0.660 - 3.341)	1.681(0.713 - 3.962)	1.854(0.814 - 4.222)	2.407(1.046 - 5.542)	0.0314

PDI, overall plant-based diet index; hPDI, healthful plant-based diet index; uPDI, unhealthful plant-based diet index; Q, quintile. Model 1 was adjusted for age (year,continuous) and body mass index (kg/m²). Model 2 was additionally adjusted for education level, smoking status, alcohol consumption, physical activity energy intake

4. Discussion

After adjusting for socio-demographic characteristics and lifestyle factors in a community-based cohort of Korean adults, the association between the PDI and CHD differed by sex. Among women, a greater adherence to the PDI or hPDI was found to be inversely associated with the CHD risk, while a greater adherence to the uPDI was positively associated with the CHD risk. However, no significant association was noted between different types of plant-based diets and CHD in men.

This is the first study to report association between different plant-based diets and 10-year risk of CHD in Korean adults. We found similar association between different plant-based diets and CHD in the Western population. Various systematic review and meta-analysis studies have reported that a higher score of PDI is moderately associated with a lower risk of CHD [22]. PDI and hPDI diets are associated with the lower risk of hypertension in middle-aged adults [23]. Prior studies have demonstrated an association between higher score of PDI and hPDI were lower risk of T2D but higher score of uPDI was associated with a higher risk of T2D in US adults [24]. A Chinese study showed that a higher score of PDI and hPDI reduces the T2D risk [25]. In addition, there was a prospective cohort study indicated that the PDI and hPDI were associated with a lower risk of CHD, while the uPDI was associated with a higher risk of CHD in US adults [7]. However, a study on Iranian women indicated that higher PDI and hPDI scores are not related to obesity [26].

A previous analysis demonstrated that a higher intake of foods with hPDI is strongly associated with the risk of CHD [7]. The healthful plant-based diets comprise a higher proportion of whole grains, fruits, vegetables, legumes, tea, and coffee and lesser intake of refined grains, sugar-sweetened beverages, animal fat, and meat. Healthy plant foods have low energy density and comprise high dietary fiber, unsaturated fatty acids, and low saturated fats and cholesterol [27-29]. The low saturated fat and high fiber content could help with weight control and reducing the CVD risk [11]. A meta-analysis of randomized controlled trials found that total cholesterol and LDL cholesterol decreased with the fiber intake of 2–10 g/day [30]. A high intake of dietary fiber reduces body weight, systolic blood pressure, and total cholesterol and lowers the incidence of CHD and stroke [31]. Intake of low saturated fat and high unsaturated fat is associated with a lower risk of CHD [29, 32]. Plant foods are rich in antioxidants, polyphenols, vitamins C and E, and beta-carotenes that help reduce the risk of developing CVD [33]. Polyphenols improve the lipid profile, limit LDL oxidation, reduce vascular inflammation, and improve the cardiovascular health [34, 35]. Healthy plant-based diets contain micronutrients such as potassium and magnesium. Potassium helps in reducing the blood pressure, while magnesium improves the cardio-metabolic outcomes [36, 37]. Conversely, the uPDI emphasizes a low intake of healthy plant foods and is thus positively associated with the abovementioned chronic diseases, including T2D and kidney diseases [12, 14]. Unhealthy plant foods comprise a higher amount of sugar and lower amounts of unsaturated fats, dietary fibers, micronutrients, and antioxidants, which could adversely affect the cardiovascular health.

This study did not find any association between different plant-based diets and CHD in men. A previous analysis showed that different plant-based diets are inversely associated with T2D, CHD, and weight gain [7, 14, 15]. The consumption of different plant-based diets varies depending on the dietary patterns of Asian and Western populations. For instance, Asian populations have a lower consumption of animal foods [38, 39]. The traditional Korean diet is diverse, mainly composed of a large amount of vegetables, fruits, and grains, and is often combined with various side dishes. However, Korean men consume a lesser proportion of plant-based foods than women do. This could also limit the ability to detect an inverse relationship between CHD and different types of plant-based diets in men.

Different plant-based diets such as overall plant-based diets, healthy plant-based diets, and unhealthy plant-based diets influence CHD only in women. This could be because women consume a greater proportion of plant-based foods than men do. Additionally, in Asian populations, diet quality may increase the risk of developing some chronic diseases such as hypertension and metabolic syndrome in women compared to that in men [40, 41]. Previous studies have demonstrated that diets or foods have different effects on the blood pressure, mortality, and circulating sex hormones in men and women [41, 42]. Factors such as difference in the lifestyle and disease management may be responsible for this sex difference. Hence, more research on this topic is needed to determine how differences in the dietary habits of men and women impact their health.

This is the first prospective study to examine the association between different types of plant-based diets and the risk of CHD in Korean adults. By utilizing recently created plant-based diet indices, our study assessed prospective associations between different types of plant-based diets and the risk of CHD based on sex. Our findings may help improve the current understanding on the potential link between CHD and different plant-based diets over time. The strength of this study includes the data from a large community-based cohort and validated FFQ and repeated dietary assessment. However, this study has several limitations as well. Data on vegetable oils were not included, because the FFQ does not measure the vegetable oil consumption. Different sources of vegetable oils could have affected the blood lipids differently. Furthermore, healthy, and less healthy plant foods such as fruits and fruit juices are grouped together in the FFQ data. Categorization of food groups needs to be changed. Less healthy and more healthy plant foods were not completely separated from one another, which could explain the attenuation of the relationship between the CHD risk and different types of plant-based diets. Lastly, although statistical analysis models are available for multiple covariates, various residual confounding factors may still be present.

In conclusion, this prospective cohort study demonstrates that high adherence to PDI and hPDI are beneficial for CHD prevention, while adherence to uPDI may higher the risk of CHD in Korean women. Furthermore, more prospective studies examine the association between plant-based diets and CHD among various Asian populations with different dietary habits need to be conducted.

References

1. Cardiovascular diseases (CVDs), (2021 June 11), [https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)).
2. Sahin, B. and Ilgun, G. (2022), "Risk factors of deaths related to cardiovascular diseases in World Health Organization (WHO) member countries," *Health Soc Care Community*. 30(1), pp. 73-80.
3. Causes of Death Statistics in 2021, (2022 10.31), <http://kostat.go.kr/portal/eng/pressReleases/1/index.board?bmode=read&aSeq=421206&pageNo=&rowNum=10&amSeq=&sTarget=&sTxt=>.
4. Merz, A.A. and Cheng, S. (2016), "Sex differences in cardiovascular ageing," *Heart*. 102(11), pp. 825-31.
5. Bhupathiraju, S.N. and Tucker, K.L. (2011), "Coronary heart disease prevention: nutrients, foods, and dietary patterns," *Clin Chim Acta*. 412(17-18), pp. 1493-514.
6. Yokoyama, Y., Levin, S.M. and Barnard, N.D. (2017), "Association between plant-based diets and plasma lipids: a systematic review and meta-analysis," *Nutr Rev*. 75(9), pp. 683-698.
7. Satija, A., Bhupathiraju, S.N., Spiegelman, D., Chiuve, S.E., Manson, J.E., Willett, W., Rexrode, K.M., Rimm, E.B., and Hu, F.B. (2017), "Healthful and Unhealthful Plant-Based Diets and the Risk of Coronary Heart Disease in U.S. Adults," *J Am Coll Cardiol*. 70(4), pp. 411-422.
8. Kahleova, H., Levin, S. and Barnard, N.D. (2018), "Vegetarian Dietary Patterns and Cardiovascular Disease," *Prog Cardiovasc Dis*. 61(1), pp. 54-61.

SSSED-24

A study based on cognitive theory to improve the result of mathematics lessons

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Abstract: An attempt was made to improve learning outcomes in the cognitive theory of learning /learning conditions/ with the aim of improving the learning outcomes of the 10th grade students of the Lyceum School of Technology in Darkhan-Uul province of the University of Science and Technology. Based on providing the basic knowledge of the subject content to the students according to the mathematics lesson plan, independent work was given problems of 3 levels from the easiest to the most difficult for a period of 15 weeks. Also, within the subject of this course, Khan Academy-learning management system provided video and picture lessons related to the subject to reinforce knowledge. The analysis proved that by giving students the opportunity to repeat the same topic in various ways, there was an improvement in knowledge and skills. I used the comprehensive 10th grade math syllabus from the Institute of Education's website for all levels of secondary school subjects. Also, the knowledge level of the students was evaluated with a knowledge test according to the criteria for evaluating the learning results. According to this cognitive/situation-based learning/ theory, the process of imparting knowledge in a hierarchical manner was training students to work independently with a passion for learning. According to the results of the research, t-test analysis using SPSS software showed that the results of the pre-test and post-test are correlated and highly significant. It can be seen from the academic progress of the students of the experimental group (11%) that the goal of eliminating backwardness in mathematics is being achieved to a certain extent.

Keywords: open educational resources, assignment, results

1. Introduction

Backlogs due to Covid 19. The delay of one full year in terms of time and 1.5 years in terms of study content had a negative impact on the quality of education and learning methods. Also, by order A/190 of the Ministry of Education and Science dated May 21, 2021, a "Comprehensive plan to eliminate backlogs" has been developed and is being implemented in each lesson. Nationally, the result of the performance of the mathematics test of the senior high school is 45.2%, which is an unsatisfactory assessment. More than 20% of all students responded that they were not interested in Mathematics and these students received a failing grade in this subject. On the basis of these problems, this topic was studied. Blazenka Divjak "Case study of their implementation and evaluation by using e-learning" 2019, Anima, "Cognitive Load Theory and Mathematics Learning: A Systematic Review" 2021, Yakin Niat Telaumbanua "Development of Mathematics Module Based on Metacognitive Strategy in Improving Students' Mathematical Problem Solving Ability at High School" 2021, Zimmerman, Barry J. "Self-Regulated Learning and Academic Achievement: An Overview", Pintrich, Dale H. Schunk, Judith "Motivation in education : theory, research, and applications" 2014, Dorj B, Gerelchuluun M "Problems of organizing training based on students' intellectual abilities" 2019, Munkhsaruul B "How to become

an independent learner?", Saikhanjargal T "Metacognitive strategy" The results of these researches were based on cognitive theory. It has studied the results by trying and implementing the learning process in its own research work, focusing on intelligence, intellectual activity, knowledge, and thinking.

Purpose of the study

In order to improve the learning activity and academic results of students in mathematics, test the methods of /learning conditions/cognitive theory and analyze the results.

Research objective

1. To determine the level of previous knowledge of students in mathematics and to clarify their learning attitude
2. Try out the combined learning method in mathematics
3. To test the methods of improving academic results based on the learning conditions of cognitive theory
4. Analysis of research results

Research methods and methodology

Quantitative and qualitative research, document analysis and questionnaires

Innovative aspects of research

By conducting an experimental lesson aimed at developing and supporting students' abilities, improving and forming relationships, students learned team learning methods. Students were given self-responsible homework to improve their level in mathematics. It was organized and evaluated by the method of observation based on the learning conditions of the mathematics course.

2. Survey Research

Cognitive theory studies the mind and the act of learning, focusing on knowledge and thinking. scientists are Piaget and Gagne. Cognition and the origin of knowledge. The Swiss psychologist studied the basis of human cognition and called his theory Genetic Epistemology. He identified 4 stages of cognitive development in children. Jean Piaget's research has informed the teaching methodology theory about how children's cognitive development takes place and what teaching methods should be used to teach children of that age.

Conditions of Learning

Robert Gagne has developed this theory of different forms and levels of learning in the science of education. Gagne identified 5 main types of learning: verbal information, intellectual skills, cognitive strategies, motor skills, and attitudes.

In these many forms of learning, different objective and subjective conditions will be encountered. For example, learning cognitive strategies should provide opportunities to find new solutions to problems and learn new ways of thinking. The researcher believed that the process of developing intelligence is learning in a certain stage many things that are interconnected and complex, such as using terms, distinguishing between right and wrong, creating imagination, applying principles and rules, and solving problems.



Figure 2. Nine Events of Instruction by Robert Gagne

[Picture 1] 9 activities of learning conditions¹

This theory defines 9 learning activities that are compatible with the cognitive process as follows.

- 1) Focus on new knowledge
- 2) Introduce the purpose of new things to be learned in class
- 3) Recall previous knowledge
- 4) To tell new concepts and definitions of the course
- 5) Teach and advise how to do what you have learned
- 6) Give exercises and assignments on what you have learned
- 7) Check to make a conclusion on the teacher's well-done exercises and assignments
- 8) Assessment of task performance and learning
- 9) To increase the ability to use the newly learned knowledge and transform it into other things

3. Methods

An experiment in implementing stages of cognitive theory training conditions

Purpose: To support and develop the knowledge and skills to be given to students, to make students motivated to learn

The lesson that forms the content: 10th grade mathematics / Coordinate method/

Scope: Class 10th

Course topics sequence:

- Coordinate method
- Vector concepts
- Matrix theory and image transformation
- Data analysis

Methodology: combined learning, teamwork, independent work,

Form of implementation: 1 hour per week according to the lesson schedule and independently

Mode of implementation: 2 hours a week according to the course schedule and independent study

Test results:

In the context of the content of the 10th-grade mathematics course, the previous knowledge level of the students was evaluated and divided into levels I-IV according to the criteria below (Table No. 1)². After that, the experimental lesson was organized in the following ways.

¹ [Суралцахуйн онол, загварууд | Баатарын Батаа \(bataabaatar.blogspot.com\)](http://bataabaatar.blogspot.com)

² [Нүүр хуудас - Цахим хичээл](#)

1. After providing the theoretical knowledge of each subject of the mathematics course, each student's progress was marked by doing homework with three levels of problems from easy to difficult.
2. The teacher made a schedule to work with the students who were behind in learning and taught them by explaining the problems individually and encouraging them by discussing the importance of mathematics. As a result, 2-4 students from each class improved their self-confidence significantly from students who were uninterested in the lesson and did not understand.
3. Using the "GeoGebra"³ math program, each subject of the classroom lesson was explained with pictures. Seeing math pictures in real life was very helpful in understanding the lesson.
4. Invitations were sent to each student's e-mail address in the "Khan Academy"⁴ mathematics education and management system, and they were registered separately for each class. Thus, after each classroom unit lesson, "Khan Academy" repeated video lessons in English to reinforce mathematics knowledge in a foreign language. Also, using the evaluation system, he took a test after each topic and made his own evaluation. The progress evaluation of each class and the student was reviewed and presented through the system. This online system opened up a way for students who excelled in mathematics to further study independently. There are developing a lot of students who are interested in taking the international mathematics test "SAT".

The academic achievement of students improved by developing the basic knowledge specified in the lesson plan and by studying independently at home. After 3 weeks, the level of previous knowledge increased by 20-30 percent when thinking about problems according to the evaluation criteria. The greatest change was seen at levels 2-3. However, it is believed that there is no change in levels 1 and 4 due to the small number of very good students and students who have a poor performance.

[Table 1] Model of evaluation comparison⁵

4.2 A point on a curve conditions of existence explains, exists determines whether midpoint of the segment, between two points distance, inclination of the line, straight and circular about Eq using your concepts think policy used.	• Coordinates is given point to TÜKS by establishing at which point knows existence. • Intensity middle point, two between points about distance understand familiar ease of conditions think policy. • Straight general the equation in form transferred. • Coordinate on the mother center and radius be known circle during the equation writes.	The graph is given on straight lines and curves does not exist examples of points output and coordinates to define, is the coordinate the given point without establishing plane flat of angular coordinates at which point in the system establish existence explains. • Averaging the volume point and colon the distance between understanding about familiar difficulty in the situation less policy think • General straight line from Eq find the slope. • Ward radius from Eq and of the ward center find the coordinates.	• By Eq given straight line and on the curve exists and of nonexistent points exemplifies, explains • Averaging the volume point and colon the distance between understanding about composite using familiar and familiar not in some conditions think policy. • A given point attacked of inclined line write an equation • Coordinate mother-centered, the given point of the attacked ward writes the equation.	• Explains the condition that a plane point lies on a given line and curve, and uses it to think of suitable difficult problems. (i.e., find the value of the parameter so that it exists) • Uses the understanding of the mean point of the curve and the distance between two points to think of suitable difficult problems in unfamiliar situations. • Write the equation of a straight line based on the given conditions and think complex problems. • Writes the equation of a circle centered on the origin of coordinates, and uses them to solve complex problems.

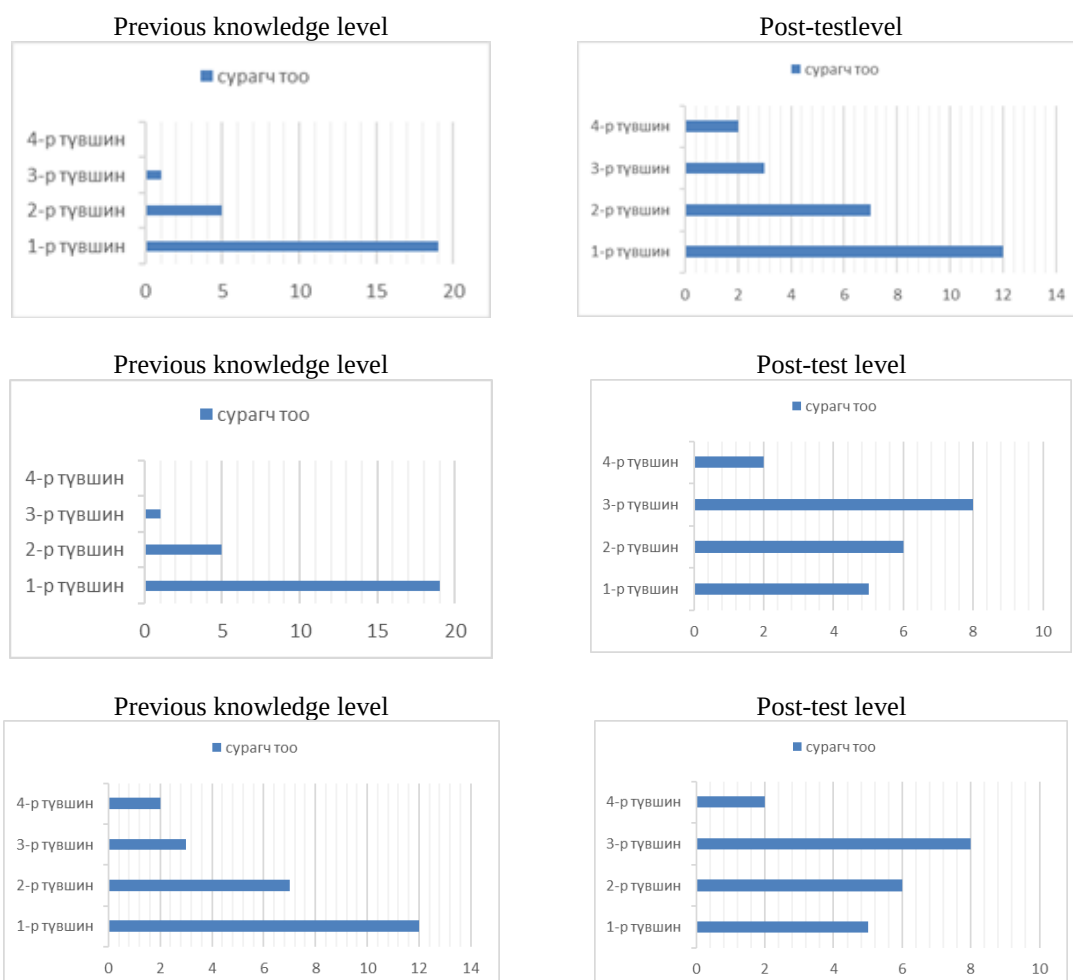
³ [Classes | Khan Academy](#)

⁴ [ГеоГebra бол 100 сая гаруй суралцагч, багш нар ашигладаг дэлхийн хамгийн нэртэй, үнэгүй математикийн хэрэгслүүд юм \(geogebra.org\)](#)

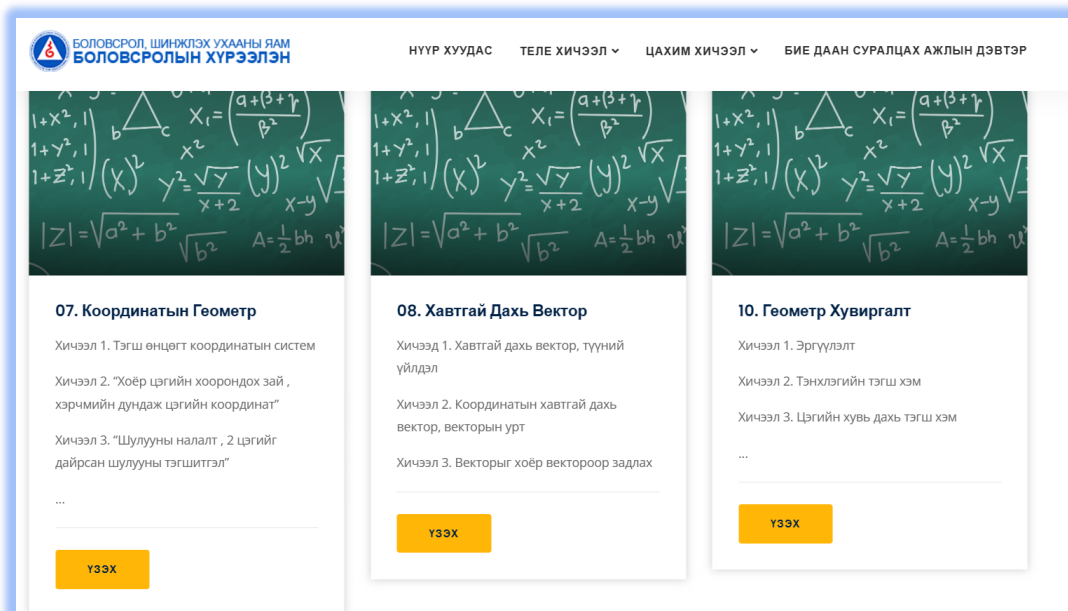
⁵ [BYT - ebook.eec.mn](#)

Matrix and Geometric Transformations

Learning Outcomes Learning Outcome Criteria	
Student matrix, on it perform the action to matrix determinant and calculate the inverse matrix, will be used. (10.4a, b, c, d, d, f)	1 Represents information in the form of a matrix, defines, writes, marks the rows, columns, elements and dimensions of a matrix, recognizes equal, opposite, zero, identity matrices, defines and marks the determinant and inverse matrix of a matrix, performs matrix addition, multiplication by numbers, and matrix multiplication, describes the properties of matrix operations with examples, finds the determinant of a 2x2 matrix, determines whether it is invertible, and finds.
2 Think about problems using the knowledge and skills associated with the matrix. 16. The student will be able to recognize and define geometric transformations in the coordinate plane, find transformation formulas and matrices, and find successive transformation matrices. (10.11a, b, c, d, f*, j*)	1 Determines point and axis symmetry, parallelism, rotation, and homothetic transformations in the coordinate plane, recognizes and finds transformation formulas and matrices, and solves simple problems. 2 Transformations in the coordinate plane and given a transformation matrix, performs, differentiates, and interprets transformations, sequential transformations finds and interprets matrices, and uses these knowledge and skills to think about problems



[Picture 2] Previous and post knowledge level



[Picture 3] Open educational resources in [Нүүр хуудас - Цахим хичээл](#)

The screenshot shows the Khan Academy Teacher Dashboard. It displays a table of assignment scores for various students. The table has columns for different topics and rows for individual students. The scores are represented by green checkmarks, orange numbers, or grey dashes.

STUDENTS	Points on the coordinate plane Feb 14	Quadrants of the coordinate plane Feb 14	Quadrants on the coordinate plane Feb 14	Coordinate plane parts review Feb 14	Graphing coordinates review Feb 14	Coordinate plane: graphing points Feb 12	Plotting a point (ordered pair) Feb 12	Finding the point not graphed Feb 12	Coordinate plane word problem examples Feb 12	Plotting a point (ordered pair) Feb 12
Азжаргал	100	✓	86	✓	✓	✓	✓	✓	✓	✓
Амарбаясгалан	-	-	-	-	-	✓	✓	-	-	✓
Б. Номин-Эрдэнэ	-	-	-	-	-	-	-	-	-	-
Б. Төгөлдөр	100	✓	71	✓	✓	✓	✓	✓	✓	✓
Батмөнх	-	-	-	-	-	-	-	-	-	-
Батхөлбоо	100	-	100	✓	✓	-	-	-	✓	-
Г. Номин-Эрдэнэ	100	-	-	✓	-	-	✓	✓	-	✓
Ган-Эрдэнэ	-	-	-	-	-	✓	✓	✓	✓	✓
Дэлгэр	86	✓	-	✓	✓	✓	✓	✓	✓	✓

[Picture 4] Results of tests conducted in the Khan Academy e-class

▶	▶	▶	▶	▶	▶	▶	▶	▶
Finding the point not graphed Feb 12	Coordinate plane word problem examples Feb 12	Plotting a point (ordered pair) Feb 12	Finding the point not graphed Feb 12	Points and quadrants example Feb 12	Coordinate plane word problem examples Feb 12	Coordinate plane: graphing points Feb 9	Coordinate plane: graphing points Feb 9	Plotting a point (ordered pair) Feb 9
✓	✓	✓	✓	✓	✓	-	-	-
✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	-	-	-
-	-	-	-	-	-	-	-	-
✓	✓	✓	✓	✓	✓	-	-	-
✓	✓	✓	✓	✓	✓	✓	✓	✓
-	-	-	-	-	-	-	-	-
✓	✓	✓	✓	✓	✓	✓	✓	✓
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓

[Picture 5] Information on the progress of the students who watched the video lessons

NEW FILE.
DATASET NAME DataSet1 WINDOW=FRONT.
T-TEST PAIRS=emne WITH dars (PAIRED)
/CRITERIA=CI (.9500)
/MISSING=ANALYSIS.

T-Test
→ [DataSet1]

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1. emne	77.2083	48	12.62041	1.82160
dars	83.1458	48	11.45944	1.65403

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1. emne & dars	48	.873	.000

Paired Samples Test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1. emne - dars	-5.93750	6.16582	.88996	-7.72787	-4.14713	-6.672	47	.000

[Picture 6] t-test in SPSS program

When calculating the method of paired sample t-test in SPSS program

$t = -6.672$ $df=47$ $sig=0.0005$ P-value is less than 0.000 or $0.0005 < 0.05$, so there is a statistically significant change. Therefore, the hypothesis that teaching mathematics based on cognitive theory will be effective in teaching has been proved to be true.

Conclusion

1. When testing the method of improving academic results based on the learning conditions of cognitive theory, it can be seen that students' academic progress improves and their active motivation to participate in classes increases. Therefore, it is considered that cognitive theory is important for successful learning in mathematics.

2. When clarifying the learning attitude of students in mathematics courses, it was observed that in modern times, teamwork, teaching each other, and learning using technological advances were more common.
3. By experimenting with the combined learning method in mathematics, it was suitable for the students' learning style, not only did their academic success improve, but also their interest in learning increased.
4. According to the results of the research, t-test analysis using SPSS software showed that the results of the pre-test and post-test are correlated and highly significant.

References

- [1]. Ж.Даваа (2002) Боловсрол судлал Улаанбаатар хот
- [2]. Ж.Даваа Нар (2009) Боловсрол судлалын үндэс Улаанбаатар хот
- [3]. М. Дэлгэржав (2012) Багшийн мэргэжил дээшлүүлэх асуудалд Улаанбаатар хот
- [4]. С.Батхуяг, Б.Төртогтох, Н.Цогзолмаа (2015) “Боловсрол судлалын судалгааны ажлын арга техник” Улаанбаатар хот
- [5]. С. Эрдэнэцэцэг, С. Батхуяг, Ш. Ичинхорлоо (2019) [бусад 4] ”Багш боловсролын үндэс” Улаанбаатар хот
- [6]. Ч. Дэчинпунцаг; Ц. Содов (2021) “Мэдээллийн технологийн хэрэгслүүд, эдгээрийг сургалтад хэрэглэх арга зүй” Улаанбаатар хот
- [7]. Нээлттэй боловсрол- <http://www.edx.edu.mn/courses/course-v1:MUST+OE101+2020/about>
- [8]. Суралцахуйн онол, загварууд | Баатарын Батаа (bataabaatar.blogspot.com)
- [9]. Боловсролын үнэлгээний төв, <https://www.eec.mn/>
- [10]. Khan Academy, <https://www.khanacademy.org/>
- [11]. GeoGebra <https://www.geogebra.org/>

SSSED-25

Feasibility study of the translation of some technical terms used in English textbooks (on the example of English verbs)

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Abstract: According to the translation theorist V.N. Komissarov, <<The characteristic features of the composition of the scientific and technical topic are its reporting quality (perfect meaning), logical quality (strict sequence, main idea, and the precise connection between its elements), concreteness, realism, and it appears in a clear and understandable way. However, in such topics, it is preferable to use language tools suitable for the needs of the communication field, and to use scientific and technical terms and special vocabulary>> Therefore, we aimed to prove that what are the language difficulties in translating technical terms and the precise meaning, branching meaning, close and opposite meaning, origin, tone of composition of technical terms and correct translation is possible.

Key words: polysemy, source – language, target language, lexical units, phrasal verbs

1. Introduction

In our country, it has been more than ten years since English was recognized as a second language at the state policy level, and it has been almost twenty years since it began to be intensively taught in the curriculum within the educational system. The need to research and develop linguistic issues was brought to the fore, and it became an important starting point for the creation of many research and research works. In reviewing the research works in this field, Dr. and Professor Choi Luvsanjav, B. Chuluundorj, E. Chinbat, N. Hajidsuren, J. Oyuntsetseg, Z. Ganchimeg, Ts. Sumyaa, S. Narantuya, B. Uranchimeg, and B. Dagiimaa. In terms of the practical importance of language study, the research work related to the problem of language learning and teaching methods can be highlighted.

If English linguistics is viewed from a multidisciplinary perspective, one of the important issues to study is the question of compound words, which are very common in modern English. The phenomenon that belongs to the scope of this decisive problem is related to multi-level studies of language such as word formation, lexicology, syntax, and vocabulary, and considering the problem in parallel with similar and similar phenomena in terms of non-type language functions has a significant effect on correctly recognizing the essence of the phenomenon.

Many studies have been conducted on vocabulary, but this branch of linguistics cannot be considered fully developed and deeply developed. First of all, it is multi-faceted and wide-ranging when compared to language vocabulary, phonetics, construction studies, and syntactic structure. Secondly, new words are constantly being created in the mentioned language, one part of the word becomes obsolete, and the scope of use of the other part becomes accessible to the general public. For this reason, this research aims to show how the modern English idiomatic auxiliary formation and how it can be expressed in Mongolian with the help of simple verbs and translated equivalently to the meaning of ready verbs.

The research focuses on the parallel benchmarking method, which is used to compare and analyze languages with different systems. Also, taking into account that the internal structure of the meaning of

the word is hidden, it is not always possible to reveal it by traditional linguistic methods, so the component method was used to divide it into components.

2. Survey Research

2.1 Analysis of Mongolian and English idioms

According to most scientists, the words that make up idioms in the common sense have lost their basic meaning, but they are very unified and stereotypical, and furthermore, idioms have a broad and deep meaning because they indicate a hidden idea. For example, In the following table we have suggested some researchers' theoretical understandings of idioms and its peculiarities in linguistic terms

Name of researcher	Terminology	Ideas about understanding	Explanation
Choi. Luvsanjav 1985/MASU, Language and Literature Institute	Compound word Free compound words Stabilized/stereotyped compound words	Linking word A typical conjunctions Stylistic conjunctions	2 terms with 1 concept Before 1963 or /before issuing Linguistic Dictionary of the terminology Last issued in 1964 and approved
Linguistic Dictionary of the terminology VV Vinogradov	Stereotypes 3 types of idioms or mixed idioms, combinations of idioms, combinations of idioms	Idioms 4 idioms	He classified the first 3 idioms
N. M. Shansky	Idioms are divided into 2	1 st type are proverbs, proverbs, old sayings, wise sayings, and wise sayings. 2nd type is an idiom which introduced that marks as concept	
Some scientists	Synonymous terms are included in idioms	They said that it is important to carefully study the content of idioms and the principle of classification	
Mongolian scientists	In terms of the origin and use of Mongolian idioms, there is no study and determination of which is the written language, which is the spoken language, and which is the intermediate language.		Conducting research like this, developing a glossary of Mongolian idioms and a comprehensive dictionary of Mongolian-Russian idioms... is very necessary for the use of the general public.
Summary Russian and Mongolian scientists:	They believed that the semantics of idioms is one of the important issues	The concept of idiom has been studied.	Introducing to the opinions of other foreign scientists proves that it is an important topic

Therefore, the distinguishing feature of idiom from modern art is that it has preserved the "oral and written" tradition and has a descriptive style that reflects the customs and mentality of the Mongolian nation. is an independent study. See Figure 1

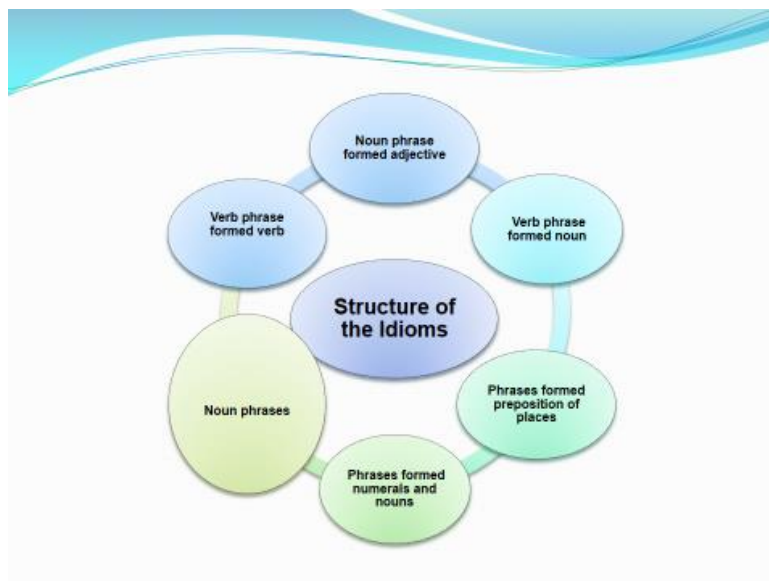
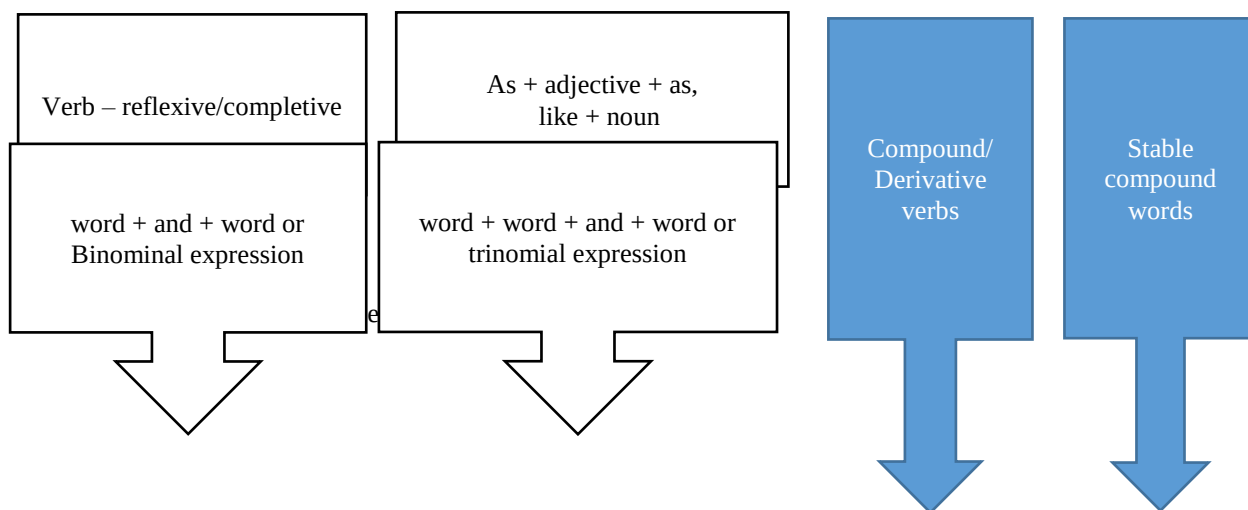


Figure 1. Structure of Idioms in Mongolian language

2.2 Analysis of English and Mongolian idioms

However, English scholars Michael McCarthy and Felicity O'Dell [1] in their work English Idioms in Use defined that "idioms whose meaning cannot be understood from the meaning of the words they are composed of are idiomatic expressions" and classified them structurally as follows. See Figure 2

Figure 2. Structure of Idioms in English language



words, the external meaning of the word is divided into synonymous meaning, antonymous meaning, idioms and metaphors. For example,

1) Synonymous meaning:

№ Idiomatic words

- 1 bring down something/bring something down- газардах; bring somebody down/bring down somebody- түлхэж унагаах,

Non-idiomatic words

- bring along- юмыг авчрах/хэн нэгнийг авчрах; bring back- буцаж ирэхдээ авчрах; bring somebody back something-эргэж ирэхдээ хүнд

		юм авч ирэх; bring back memories- эргэж бодогдуулах
1a	Bring smth/smbd down	Bring along, bring back, bring smbd back smth
1b	Bring down smth/smbd	Bring back memories

2) Antonymous meaning:

№	Idiomatic words	Non-idiomatic words
2	1.To be fed up/ залхах, цадах / 2.to put up with/тэвчих/ 3. to be intolerant /хүлээцгүй байх/	to be full / гэдэс дүүрэн цатгалан байх
2a	Be fed up, put up with, be intolerant	Be full
2b	V+ adverb+ preposition	V+ adjective

3) As idioms:

№	Idiomatic words	Non-idiomatic words
3	A. Хүний үйл хөдлөлийг заасан-go up, end up, eat up, etc Б. Хүний бүтээсэн зүйл: 1. go up / бизнесийн хэлц/ 2. set up /техникийн хэлц/	go on (meeting) - / хурал/ үргэлжлэх, өөрөөр хэлбэл бизнесийн ердийн хэллэг юм, go over- / микрофоноо/ эфир шилжүүлэх өөрөөр хэлбэл техникийн ердийн хэллэг юм.
3a	Business idioms	Business words and phrases
3b	Technical idioms	Technical words and phrases

4) As metaphors:

№	Idiomatic words	Non-idiomatic words
4	get up – эртлэн босох , grow up- сурч боловсрох	sit down- / доош/ суух, stand up- /дээш/ босох
4a	Get up, grow up	Sit down/sit, stand up/stand
4b	V+ adverb	V+ preposition

The following shows the ratio of the meaning of idiomatic and non-idiomatic words at the level of external and internal meaning. In the research section on idioms and their forms and categories, the following concepts and explanations are shown with examples. For example, as Type A includes proverbs and descriptive words.

1. Proverbs: Things are compared to each other as in the example,

* means used the website: www.googletranslate.com

A	Example
1a Эмийн эх ус, Эрдмийн эх үсэг	The source of medicine, the source of science*
Compared with	
In English	In Russian
An apple a day keeps a doctor away	Ешь яблоко в день обойдёшься без врача.
❖ Eat an apple a day, you can do without a doctor.*	

2. Descriptive words: It is an analogy that embellishes the depth of the phenomenon.

A	In Mongolian
2a Эх нь булингартай бол адаг нь булингартай	If the source is cloudy, the bottom is cloudy*

Compared:

In English

A bad beginning makes a bad ending

❖ Муу эхлэл муу төгсгөлийг бий
болгодог*

In Mongolian

Что посеешь, то и пожнешь

What you sow, you reap*

Moreover the sayings of philosophers and scientists are called clichés or idioms. These include the following as Type B as in the example:

1. Word of wisdom : It is a short phrase that sums up the life experience.

B

1a Амьдарч чадвал амьдрал агуу.

In Mongolian

Life is great if you can live it*

Comparing:

In English

Life is great if you don't weaken.

In Russian

Жизнь прекрасна, если ты не слабеешь.*

❖ Сулрахгүй бол амьдрал сайхан*

2. Quotation: It is a phrase that wisely calculates the common characteristics of phenomena.

3. Sayings: It is a phrase blessed by those who have been taught why it should not happen.

B

3a Залуу цагт эцэг эхийн эрхээр

In Mongolian

At a young age, by parental rights*

3b Идэр цагт эхнэрийн эрхээр,

At times, by the right of a wife,*

3c Өглөх цагт хүүхдийн эрхээр.

Children's rights at bedtime.*

Comparing:

In English

In youth (a man is under the) power of
his parents.

In Russian

В юном возрасте по родительским правам*

In his prime (a man is under the) power
of his wife.

Иногда, по праву жены,*

In old age (a man is under the) power of
his children.

Права детей перед сном*.

Explanation: In youth (a man is under the authority of his parents). When he is strong (a man is under the authority of his wife). In old age (a man is under the authority of his children).

4. Blessing words: It is an expression that refers to the inner nature and nature of phenomena.

B

Mongolian-Eng

4a Анхны юм амттай,

The first thing is delicious*

4b Шинэ юм шимтэй,

Fresh things,*

4c Анхны сэтгэгдэл амь бөхтэй.

The first impression is strong.*

Жишээ өгүүлбэрийн онцлог

Англи хэлэнд байгаа
өгүүлбэр

жишээ Орос хэлэнд байгаа жишээ өгүүлбэр

First impressions are half the battle

Первые впечатления — полдела*(eng-rus)

Note: First impressions are half the DEAL*(eng-rus) (See Figure 4.)

3. Methods

The meaning of Russian verb status in Mongolian language is considered to be translated in four main ways by the sub-scientist A. Sharkhyu in his article "Problems of Translating Russian Verb Status". It includes:

1. Common or lexical method

2. Syntactic or discourse method
verbs with the same or



3. Method of repeating
different roots

4. Semantic method

1. Examples of lexical methods

In Russian:

сверкать
перемигивать
блестеть

In Mongolian:

гялганах
анивалзах
гялалзах

As for the 1st method, it means to attach a special suffix to the base of the verb, and to show the event that happened, such as the event continued for a long time, repeated again and again, or even completely finished. For example: glimmer-glow, blink-peperemigivat, glimmer-glitter, etc.

2.Examples of syntactic or discourse method

In Russian:

приближать
напевать
заснуть

In Mongolian:

Хүрч явах
Дуулж суух
Унтаад өгөх

As for the 2nd method, instead of auxiliary verbs that enter the infinitive form, verbs such as lie down, sit down, and go, which are used occasionally, are combined with the main verb to indicate that the event has been repeated many times or that it lasted for a long time. Also, if the participle form of the verb includes auxiliary verbs such as take, give, leave, throw away, it mainly corresponds to the perfect form of the verb.

3. Examples for the method of repeating verbs

In Russian:

Брать обеими руками-
Получать награду
Принимать на работу
Принимать меры
Убирать богатый урожай
Снимать головной убор
подозревать
Становиться упитанным
фотографировать
Жениться
простудиться
принимать
покупать
усыновлять
ударить

In Mongolian:

Хоёр гараараа авах
Шагнал авах
Ажилд авах
Арга хэмжээ авах
Арвин ургац авах
Малгайгаа авах
Сэжиг авах
Тарга хүч авах
Зураг авах
Авгай авах
Салхи авах
Хүлээн авах
Худалдан авах
Үрчилж авах
Цохиод авах

As for the 3rd method, in the modern Mongolian language, verbs are used repeatedly to indicate that the event has lasted for a long time or has been repeated, which corresponds to the meaning of the Russian imperfect verb.

4.Semanitic

Орос хэлэнд байгаа жишээ өгүүлбэр
Брать-

Монгол хэлэнд байгаа жишээ өгүүлбэр
- авах

Брать тему-	= сэдэв авах
Брать работу на дом-	=гэртээ хийх ажлаа аваад явах
Брать нового работника-	=шинэ ажилтан авах
Брать в солдатъ-	=цэрэгт авах
Брать штраф-	=торгох
Брать цитату-	=ишлэл авах
Брать место-	=зай авах

As for the 4th method, there are not many words as equivalent ones in any language. But most of them have transferred meanings.

4. Results

Based on modern English language usage, the research was conducted with the aim of analyzing the unique expressions related to English idiomatic verbs, analyzing them from the semantic point of view, and discovering the methods of translating the unique expressions. For example:

- Discovered that some particles are followed the certain verbs and its meanings are transferred as: applying 'down' was found as a preposition or particle in 145 Phrasal Verbs but 'up' was found as a preposition or particle in 392 Phrasal Verbs. In Technical English textbooks there included 404 words for investigating phrasal verbs with the certain verbs and idioms with the certain words.

As a result of it, we summarized that phrasal verbs with the certain verbs were covered about 13 words e.g. take, make, turn, hold, break, throw, change, press, show, open, move, leave, stretch. For applying idioms with the certain words were covered about 45 words e.g. fire, call, wall, point, over, place, red, hand, horn, black, large, matter, iron, freeze, example, between, bottom, salt, charge, life, sheet, wire, guard, cast, roll, least, strength, time, etc.

We have agreed [8] that a thorough study and consequent understanding of semantic correspondences in the English and Russian, [as well English and Mongolian] verbal systems can be quite a powerful tool in the translator's arsenal.

5. Discussion

Based on these researches in the field of linguistics, there is a need to deeply study the problems of translation grammar, the problem of translation vocabulary, and the problem of translation composition, especially language-translation problems. This is very important for the development of English translation practicalness.

References

- [1] G.Bat-Ireedui and B.Nominzul (2001), "Dictionary of Mongolian- English idioms equivalence," Ulaanbaatar, Mongolia.
- [2] O.Adiya (2000), "The precious heritage of the intelligent people," Ulaanbaatar, Mongolia.
- [3] D.Khugjmaa. (2016), "Regarding the use of Mongolian idioms and its peculiarities," Humanities of the 4th Conference, Darkhan- Uul province, Mongolia, Spring, 74-76.
- [4] L. Bearwood and Heinmann (1978), "A first course in technical English I" Student
- [5] Book of English -Russian Polytechnic Dictionary (with 280000 entry), Volume I, II
- [6] Galbadrakh, S. Battsetseg, Ya. and D. Khugjmaa (2013), "The process and recent issues of establishing Industrial Development Zones in Mongolia," Proceedings of the 8th International Forum on Strategic Technology 2013, Ulaanbaatar, Mongolia, June 28-July 1, 765-767.
- [7] Galbadrakh, S. Battsetseg, Ya. and D. Khugjmaa (2015), "A proposed method for industrial development in Darkhan- Uul province," Proceedings of ICIED 2015: The International Conference on Innovation and Entrepreneurship Development, Ulaanbaatar, Mongolia, May 5, 99-101.
- [8] Ann Stephens. (2000), "Some ways of Translating English Phrasal verbs into Russian," University of North Carolina at Pembroke, stephe01@srmc.org

SSSED-26

Comparing intellectual level between autism spectrum disorder and normal children

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Abstract: "Equal inclusion education" is the activity of including children who cannot receive educational services due to factors such as gender, language, culture, place of residence, and developmental and learning disabilities, in schools and other educational institutions. Inclusive education is the concept of providing everyone with the opportunity to receive a quality education. Attendance of school-aged children in general education is an important issue not only for parents and teachers but also for society. Although the legal framework is in place, children with autism and autistic spectrum disorders face great difficulties in studying in secondary schools due to the fact that equal inclusion does not take place in real life. One of these difficulties is the insufficient knowledge and information of teachers to recognize the various needs of students with this type of disorder and to ensure their right to education, which worries parents a lot.

Keywords: special needs education, autism, concentration, equal inclusion education, drawing activity

1. Introduction

According to Mongolia's National Program for the Rights, Protection, and Participation of Persons with Disabilities, there have been nearly 101,000 Mongolians dwelling with disabilities in 2017. Autism, which has emerged as sizeable in society in current years, is viewed as a disease, however, science considers it a behavioral and social ailment instead of a disease. In this way, Autism Awareness Month Day used to be at the same time geared up by way of non-governmental businesses working in the area of autism, inclusive of the Mongolian Autism Association NGO, "Autism Mongolian AED" NGO, Mongolian Autism Research Institute NGO, and participants of the "Divine Mothers" Facebook group. The marketing campaign will open doorways for mothers and fathers to apprehend and talk with their youth about autism in Mongolia. As of 2019, there are 763 teens and adults with autism in Mongolia, of which 273 have been registered by means of the Mongolian Autism Association, 247 via "Autism Mongolian ASD", 163 by using the Mongolian Autism Research Institute, and 520 by means of the National Mental Health Center. In 2014, there had been solely eighty teens formally registered as having autism in Mongolia. But as of the first 1/2 of 2019, this variety has elevated 9 times. [1] If autism can be detected early and taught to function well from an early age, it can be treated and in some cases become able to live independently. Therefore, early detection and early intervention are important. A team of specialized psychiatrists and professional psychologists work together to diagnose and evaluate autism to distinguish it from other mental disorders. In order to distinguish it from other disorders with similar symptoms, psychiatrists conduct examinations, questionnaires, and observations, and a team of

psychologists use special tests and methods to determine development evaluations through observational questionnaires, combine these findings, and make a final official diagnosis. Research mentioned that one in 50 children are autistic according to a recent study. According to a 2017 study by the World Bank, about 2 billion of the world's 7.7 billion people are children aged 0-14. In total, 38.5 million children in the world are suffering from this disease. But for our country, which has a population of only 3.3 million, about a third of the total population is children aged 0-14. If you look at it, there are probably at least 20,000 children with autism in our country today. This is equivalent to 0.8 percent of the total population of our country, which is a very high number [4].

2. The Actual Situation of Autism Spectrum Disorders in Mongolia

2.1. Developmental Disorders

Children with developmental disorders, including Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), have been the cause of growing concerns in many countries and regions over the past several decades. Such children are considered examples of children who require educational additional support in school and are positioned as one of the main targets of specialized education support. According to the research, Mongolia was identified as an LRS in this study based on the criteria described by Lee and Meadan (2021). First, despite recent economic reforms, Mongolia is classified as an LMIC (World Bank, 2020). Second, there are limited high-quality services available for Mongolian parents of children with autism (Japan International Cooperation Agency [JICA], 2019). For example, Llewellyn et al. (2012) reported that children with disabilities in Mongolia are generally much more disadvantaged compared to their peers without disabilities, as indicated by their rights to public education, health, and adequate standards of living. Finally, about 36% of Mongolians live below the poverty line which indicates that parents would experience intensified levels of financial difficulties related to raising their children with autism [5]. In order to build the necessary support systems for children with developmental disorders, it is very important to understand how many children are in need of support and the specific kinds of support they require. Therefore, we have been conducting joint research to establish support systems for children with developmental disorders in Mongolia.[5] Disability theory emphasizes society's role in adapting to people with disabilities rather than people with disabilities adapting to society. It is a growing sentiment among many organizations in Mongolia, according to the Chief Executive Director of the Independent Research Institute of Mongolia (IRIM): We avoid calling it a disability, which is a medical term, and prefer to call it a special need; our study is concentrated more on a way to identify challenges and differences and to equip teachers to address those challenges [6]. According to Serdamba who is chairman of the Autism Research Institute of Mongolia Based on the number of ASD diagnoses worldwide, estimated that there may be as many as 18,000 people with ASD in Mongolia. However, 763 people in Mongolia have been identified as having ASD based on a genuine diagnosis. There are 40 (5.25%) adults (ages 16–34) and 723 (94.75%) children (ages 2–15). Given the disparity between the estimated 18,000 cases of autism and the 723 people who have been diagnosed with it, there are probably many more people in Mongolia who have ASD but have either received a diagnosis from another country or whose parents are unsure of where to take their children for a diagnosis.

2.2 Unique Challenges in Mongolia

In the world, the number of children with disorders is increasing year by year. As of 2012, one in every 88 children is born with autism, and in 2014, a study in the United States revealed that one in every 68 children may have autism. Based on the international average, it is estimated that 0.62% of the country's population may have autism. The number of kids with autism spectrum disorder increased by 7-8 times between 1990 and 2007 and by 78% between 2011 and 2016. On the basis of this, some

scientists are predicting the future in a very serious manner. In our country, it has already been predicted that "by 2034, autism will affect a third of the population." As a result, whether they like it or not, autistic children are born. Our only responsibility is to socialize them and assist them in setting themselves up for success. Scientists have not yet definitively determined the main cause of autism. But there are several possible reasons. One is believed to be hereditary. Because if one child has an autism spectrum disorder, there is a 2-18 percent chance that the next child will have an autistic spectrum disorder. If there were two identical twins, if one had an autism spectrum disorder, the probability of the other having autism is 36-95 percent, and for dizygotic twins, the probability is 31 percent. The second is the influence of the external environment. It is believed that many factors such as air pollution, food consumption, and chemical drugs may cause this type of disorder. [7]

3. Methods

3.1 Research Design and Setting

Objective: The purpose of the study was to compare the cognitive skills of children diagnosed with an autism spectrum disorder to same-aged peers referred for possible developmental level and behavioral concerns using "Diagnostic evaluation of the developmental level " by the Mongolian Institute for Educational Research

Participant

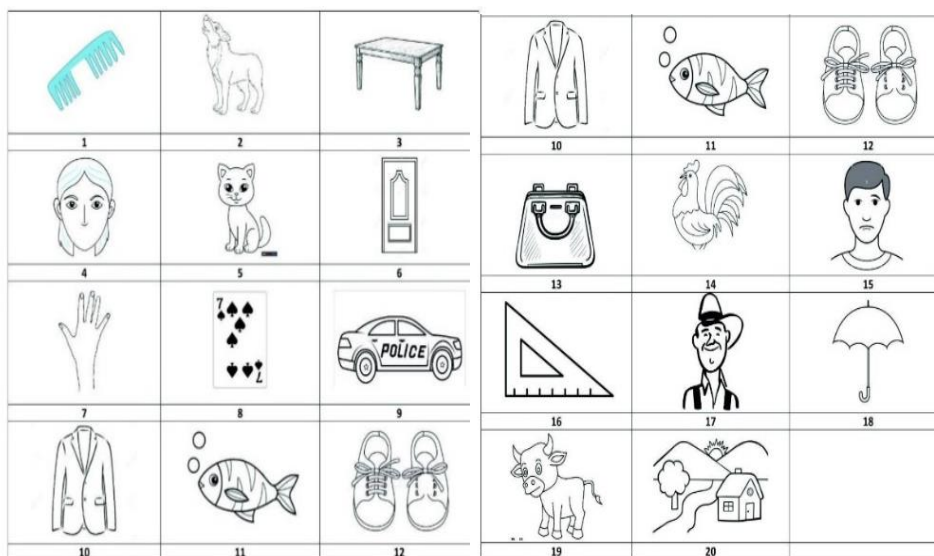
Two children were diagnosed with autism spectrum disorder and 2 normal children at the same 8-aged.

Measures

Cognitive ability

To assess general intellectual functioning, Methods for the Study of Perception by Andronnikova, E.A. and Zaika, E.V. (2011) was used to indicate the perceptual for participants aged 8 years and older. The research materials were 20 picture cards shown in Figure 1 and measure was shown Table 2.

[Figure 1] Research materials



[Table 1] Indicators and key of perceptual ability

№	Keys	№	Keys
1	Comb blade	11	Fish fins
2	Table leg	12	Missing shoe laces
3	Wolf's ears	13	The handle of the bag
4	Mouth	14	Chicken leg
5	Cat beard	15	Eyebrows
6	Door handle	16	Measuring lines in mm
7	Fingernail	17	Hat frame
8	Spades	18	Umbrella metal parts
9	Car horn	19	Animal hoofs
10	Buttonhole	20	Shade tree

4. Results, Data Analysis

Procedure and Finding

Participants were given 20 pictures to look at them for 6 minutes then they wrote missing a part of each image in the picture. When they finished we use to collect respondents on a Likert scale of 1-5 points. The results was shown in Table 2.

[Table 2] The results of perceptual ability

Materials	Response of I with ASD	Response of A with ASD	Response of E normal child	Response of G normal child
20 Picture cards	14 true 17 answered 20 words were written	16 true 20 was drawn No word was written	18 true 20 words were written	16 true 18 words were written

The results showed that when performing the task of exploring the characteristics of observational and perceptual qualities, the child I completed the missing unit parts of each of 17 pictures out of 20 pictures within 3 minutes without any obstacles. Additional changes were made. In the remaining 3 minutes, child Y used his writing skills to name each of the 20 pictures, 11 of which were correct, and 8 of them were different from the keywords due to his ability to name and write as well as in accordance with his own imagination. It can be seen that Child Y is more interested in drawing during the task. Child A also completed the missing units of 20 pictures within the given time without any obstacles, of which 14 pictures corresponded to the task key, but in the other 6 pictures, he made additional changes based on his imagination. Child A attempted to name six pictures, but none of the words were semantically related to the picture. It was observed that Child A's writing ability is weaker than his drawing ability. As for child E, as soon as he heard the instructions, he preferred to write rather than draw and complete each picture carefully. Write the other two words according to your imagination, such as plank, road, etc. As for child G, he refused to draw like child E and wrote a total of 18 pictures; 15 words were correctly written, and 3 words were named with words other than the key. Judging from the fact that child A did 14 out of 20 pictures correctly and normal students did 17–18 correctly, although the self-expression abilities of autistic and normal children are relatively different if the family can work together and develop the child's missing abilities, it will be better than the ability of normal children. It is observed that there is no difference.

5. Discussion, Conclusion

The ASD children tested in this study ranged between 9 and 10 years of age and were compared with similarly aged typically normal children. The findings from the test were shown that there is a difference in perceptual ability between 2 children with ASD. The difference shows whether their parents how to communicate with children regularly to develop them. In the result of the study we have concluded the followings:

1. Many children with ASD also have language difficulties irrespective of whether they also have non-verbal cognitive impairment or not
2. The teachers need to receive more training on the disorders and educational interventions in order to develop a positive attitude
3. In order to *support parents of children with autism* spectrum disorders, mental health professionals must know the characteristics of the disorder
4. Educators, in general, will need to be up-to-date and knowledgeable on the best teaching practices for working with children with autism.

References

- [1] Karin Schelzig and Kirsty Newman. (2020), *Promoting Inclusive Education in Mongolia* ADB East Asia Working Paper Series
- [2] Save the Children. 2018. *Needs Assessment for Promoting Inclusive Education for Every Last Child in Mongolia*. Ulaanbaatar: International Research Institute of Mongolia.
- [3] National Commission for Lifelong Education (NCLE). 2019. *Screening School Aged Children Out of the School*. NCLE Survey Report. Ulaanbaatar.
- [4] James D.Lee 2021. *Children with Autism Spectrum Disorders in Low-Resource Settings: Reported Experiences and Needs of Parents in Mongolia* Springer publication
- [5] Roger L. Dutcher 2020. *A Phenomenology of Parent And Practitioner Experiences with Autism And K-12 Education In Mongolia* Regent University ProQuest Dissertations Publishing
- [6] Asian Development Bank. (2019). *Mongolia*. <https://www.adb.org/countries/mongolia/main>
- [7] Brantlinger, E., Jimenez, R., Klingner, J., Pugach, M., & Richardson, V. 2012. *Qualitative studies in special education*. *Exceptional Children*, 71(2), 195–207.
- [7] Л.Нарантуяа, С.Одончимэг *Хэл согог засал*. Дархан 2020
- [8] Аутизмын хүрээний эмгэгтэй сурагчдыг боловсролд тэгш хамруулах нь УБ 2021
- [9] Монгол хүүхдийн бие бялдар, нийгэмшил, танин мэдэхүйн хөгжлийн онцлог УБ 2023
- [10] Хүүхдийн цогц хөгжлийн оношилгоо, шалгуур үзүүлэлт 6-10 нас УБ 2021

HSLs-27

Gender Differences on Color Naming in Mongolian Language

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Abstract: Abstract; This article aims to explore color names of Mongolian language within the frame of psycho-linguistics ways to make name for colors, investigate lingual evidences about specific features of cognition, culture and thinking of Mongolians. We determined that we identified the range of color names in both language dictionaries, defined and made cognitive explanation of thinking pattern and psycho methods of color naming in each language, examined components of color names, revealed potential of creating compounds, and tried to link issues on language, experience of cognition and thinking patterns. We conducted an experiment a. key word - reply to determine thinking patterns of Mongolians to create color name, b. key color - reply to find out distinction of Mongolians to recognize and name. Method, observation and result of this psychological test is enclosed.

The result of the experiment approved ways, patterns and logics to make color name combination and again the most creative pattern “noun + color name”. Mongolians name color in relation of natural phenomena is their prime thinking way. This experiment also revealed popular usage of color name among Mongolians. By the study, there was big difference between thinking ways to create color name combination according to gender.

Key words: color naming words, gender differences, cognition, national characteristics, competence

NGEE-28

Ferrosilicon Producing Technology Using Domestic Mineral Raw Materials

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Abstract

Iron ore content of waste iron per ton is approximately 6-8 kg of silica content (Si) ferrosilicon content of 6-8 kg. Ferroalloys, including Ferrosilicon, have been exported for a high of 4000 tons per year from China and Russia by 100%. The results of the research on the production of ferrous compounds using raw materials.

Keywords: Ferrosilicon, alloy, carbon portog, electric arc furnace, carbon electrode

1. Introduction

According to the latest research of the Ministry of Minerals, there are approximately one billion 160 million tons of iron ore reserves and findings in Mongolia. Domestic demand for steel is 500,000 tons per year, and currently 20% of it is supplied domestically. The rest is imported.

In order to obtain high quality steel that meets international standards, steel melting technology that meets international and national standards is provided by adding improver ferroalloys during steel melting.

Darkhan, Erdenet, Beren Group and Khotol Steel Co., Ltd. are working to increase their steel production capacity and meet the annual needs of their country, i.e. to produce 500,000 tons of steel per year.

For example: Darkhan metallurgical plant, with the investment of Germany, is putting into operation and testing 2 electric arc furnaces with the capacity to produce 5000 tons of steel balls per year.

In addition, a project to build and put into operation a factory with a capacity of 500,000 tons of direct reduced iron was solved in the first round of infrastructure issues.

5 km of railway and 105 km of high capacity asphalt (pavement) have been put into operation.

Depending on the composition of waste iron and iron ore, 6-8 kg of ferrosilicon with a silicon content of 75% (Si) is normally included in one ton of steel smelting.

3,500-4,000 tons of ferrosilicon is needed for the steel melting capacity of our country. One ton of ferrosilicon is purchased for 1500-1800 USD depending on the brand, and 6.2 million USD is spent annually.

Our country imports 100% ferroalloys from China and Russia at high prices.

Therefore, the research work on extracting ferrosilicon is being intensified, and there is no need to import raw materials for extracting ferrosilicon based on the results of the analysis of raw materials during the research.

2. Research materials and methodology

Mineral raw materials for extracting ferrosilicon: usually in foreign countries crushed quartz with a content of ≥ 95 SiO_2 , 0.02 P_2O_5 , size 20-25 mm, depending on the grade of ferrosilicon to be extracted, the coke used for melting is ash, low in volatile matter, high electrical resistance, and when heated iron ore or carbon steel shavings, zorgodose, (which is easy to melt due to the small size of the waste metal) were used as raw materials for extracting ferrosilicon.

Figure 1 shows the raw materials for extracting ferrosilicon.



Fig.1 Silicon Fig.2 Scrap iron Fig.3 Coke

a. Coke When it comes to ferrosilicon extraction in foreign countries, coke and coking coal are widely used in the Russian Federation, while wood / birch / coal is used in Brazil and Latin American forested countries. [2]

We used ecowood coal coke developed by the innovation development center of the Agricultural University to extract ferrosilicon. The chemical composition of wood charcoal is shown in Table 1.

Chemical composition of wood charcoal

Table 1

Material name	Ashes %	Yield of volatile matter %	Moisture %	Percentage of CO_2 , %
Coke	1.5	9.2	12.0	86.0

b. Silica used for the extraction of quartz ferrosilicate was sampled from Havchik mountain.

Table 2 shows the chemical composition of quartz from Havchik mountain in Bayankhongor province

Chemical composition of quartz from Havchik mountain in Bayankhongor province

Table 2

Element	SiO_2	Al_2O_3	FeO	CaO	MgO
Percentage	97.7-99.18	0.07-0.97	0.28-0.65	0.003	0.007

c. Materials containing iron

When we choose the ferrous material/swarf/ used in the trial melting for extracting ferrosilicon, we use good quality carbon steel, especially the connecting and disconnecting forks of the small-sized parts of the agricultural machinery, mechanical piston fingers and punch shafts that are soft in the core with high

surface hardness. Various axles, shafts, and shafts made of good quality steel without heat treatment were deliberately chopped, and the workpieces were separated from mechanical impurities and dirt by high pressure hot water and dried at room temperature for use in samples.[2]

Table 3 shows the chemical composition of carbon steel sawdust and scrap steel used for ferrosilicon production.

Chemical composition of carbon steel

Table 3

Elements	C	Mn	Si	S	P	Ni	Cr	Cu
Percentage	0.10	0.8	0.37	0.04	0.035	0.25	0.25	0.08

3. Research results

Ferrosilicon production test melting was performed in the welding laboratory of the Mechanical Engineering Department of the School of Engineering Technology, based on the process of melting in a device made by ourselves, which replaces the small electric arc furnace. Melting to extract ferrosilicon: 2 carbon electrodes with a diameter of 8 mm were connected to a voltage of 220 V and 380 A, and the melting temperature was 18000-20000 °C using the heat energy of the arc. 3 tests were conducted and the test results are shown in Table 4.

The chemical composition of ferrosilicon (FeSi) extracted in the Optical Emission Spectrometer JB750 laboratory of the Department of Mechanical Engineering was determined.

Experiment I. Table 4

Elements	Si-Percentage	Element percentage in mass				
		Mn	C	Al	S	P
FeSi	10	0.6	0.31	1.25	0.04	0.05

Experiment II

Elements	Si-Percentage	Element percentage in mass				
		Mn	C	Al	S	P
FeSi	18	0.5	0.4	1.21	0.03	0.04

Experiment III

Elements	Si-Percentage	Element percentage in mass				
		Mn	C	Al	S	P
FeSi	20	0.6	0.6	1.22	0.06	0.05

During the experiment—



Fig. 4 Temperature measurement
Fig. 6 Arc formation



Fig. 5 Voltage measurement



Fig. 7 Melted (FeSi) Fig. 8 10% Si-containing silicon (FeSi) Fig. 9 12% Si (FeSi)

4. Discussion

Experimental studies on extracting ferroalloy have not been conducted in Mongolia. The steel industry of our country imports more than 90% of its ferroalloy from China. Ferroalloy, including ferrosilicon, receives 4,000 tons of ferrosilicon annually from China, and the phenomenon of China blocking the export of ferrosilicon for an indefinite period of time is repeated many times. Our ITS and I who are conducting the research have repeatedly requested by official number to conduct research on the extraction of ferrosilicon. Therefore, we are intensively conducting research in this area. The main indicator of ferrosilicon produced in China, Russia and other years is the percentage of silicon (Si) in the chemical compound. For example: FS10, FS18, FS20, FS45, FS60, FS75. FS ferrosilicon, 1820...75 indicates the proportion of silicon.[5-17] In our experiments, FS10 was produced, and it was determined during the experiments and research that it is possible to produce siliceous iron with a high silicon content in the future.

5. Conclusion

As part of our research goals and objectives, we conducted a study on Ferrosilicon/Silicon/iron extraction, designed a small laboratory equipment and conducted experiments, and reached the following conclusions. It includes:

1. In our own equipment, which was made for the purpose of conducting laboratory tests for the extraction of iron-silicon compounds, the experimental melting was carried out at a current of 180 V

and 380 V. In the melting zone of the Portuguese furnace, the charge was melted at a temperature of 20000C, and when the chemical composition of the resulting alloy was analyzed in the optical emission spectrometer JB750 laboratory, 10% iron-silicon compounds (FeSi) were formed. Compared to the mass percentage of ferrosilicon silicon (Si) produced in China, Russia and other years, the silicon iron (FeSi) produced by the experiment is similar in composition to ferrosilicon of FS10, FS18, and FS20 brands. In the future, it is necessary to improve the capacity of laboratory equipment.

2. Based on the results of the experiment, it was determined that a mixture of 98% quartz, low carbon steel /strujik/, and wood charcoal as an annealing agent can be used for the production of iron-silicon alloy.

3. It was established experimentally that it is possible to increase the productivity of the electric arc furnace and extract FS60-75 grade ferrosilicon.

References

1. Gnatenko M.F. Velma, Kyiv (Ukraine). Plasticity of coating mass in the production of welding electrodes // "Welding production" 1999, p. 40-41
2. Sh. Byamba Preparation of standards and construction of grading graphics Text/ 1986-177 p.
3. Ruge Yu. Technika swarki. Moscow, 1984 p.549.
4. L. Dandiy "Metallurg" Ulaanbaatar, 2014. 234p
5. Balyabin R.V. Spravochnik svarshchika 1974, p.179
6. Salata, O.V. (2004) Applications of nanoparticles in biology and medicine. J. of Nanotechnology, 2, 3-8. <http://www.nanobiotechnology.com/content/2/1/3>
7. Movchan, B.A., Kurapov, Yu.A., Didikin, G.G. et al. (2011) Regulation of composition and structure of Fe-O system nanoparticles in electron beam evaporation of Fe₃O₄. Poroshkovaya Metallurgiya, 50(3-4), (478), 56-63 [in Russian]. doi.org/10.1007/s11106-011-9314-0.
8. Kurapov, Yu.A., Litvin, S.E., Romanenko, S.M. (2013) Structure and thermal stability of Ti-NaCl condensates deposited from the vapour phase in vacuum. Nanostructured Materials Sci., 1, 55-62. http://www.materials.kiev.ua/science/edition_view.jsp?id=2
9. Kurapov, Yu.A., Litvin, S.E., Didikin, G.G., Romanenko, S.M. (2011) Structure of two-phase condensates Cu-NaCl deposited from vapor phase in vacuum. Sovrem. Elektrometall., 2, 19-22 [in Russian]. <https://patonpublishinghouse.com/eng/journals/sem/2011/02/05>
10. Kurapov, Yu.A., Romanenko, S.M., Didikin, G.G., Oranskaya, E.I. (2017) Controllable synthesis of iron oxide nanoparticles in porous NaCl matrix. Materials Research Express, 4(3), 035031. doi.org/10.1097/01.rli.0000221321.90261.09
11. Paton, B.E., Movchan, B.O., Kurapov, Yu.A., Yakovchuk, K.Yu. (2010) Method of producing of metal-oxygen system nanoparticles with specified composition by electron beam evaporation and condensation in vacuum. Pat. 92556, Ukraine [in Ukrainian]. <http://base.ukrpatent.org/searchINV/search.php?action=viewdetails&IdClaim=151646>
12. Grechanyuk, M.I., Osokin, V.O., Afanasiev, I.B. et al. (2002) Method of producing of porous materials. Pat. 46855, Ukraine [in Ukrainian].
13. Grechanyuk, N.I., Osokin, V.A., Grechanyuk, I. N. et al. (2006) Composite materials on base of copper and molybdenum condensed from vapor phase, for electric contacts. Pt 2: Fundamentals of electron beam technology for producing materials for electric contacts. Advances in Electrometallurgy, 2, 8-17.
14. Osokin, V.O., Kurapov, Yu.A., Boretsky, V.V. et al. (2021) Producing of Fe, Cu, Ag nanoparticles in NaCl matrix on rotating substrate by EB-PVD method. In: Abstr. of Pap. of Int. Conf. on Modern Technologies of Joining of Materials. Ed. by L.M. Lobanov. Kyiv, IAW [in Russian]. <https://patonpublishinghouse.com/proceedings/stzm2021.pdf>
15. Movchan, B.A. (2006) Inorganic materials and coating produced by EBPVD. Surf. Eng., 22, 35-46. 11. Movchan, B.A., Demchishin, A.V. (1969) Study of structure and properties of thick vacuum condensates of nickel, titanium, tungsten, aluminium oxide and zirconium dioxide. Fizika Metallov i Metallovedenie, 28(4), 653-660 [in Russian].

SSOT-29

A study of factors impacting quarter-life crisis in early adulthood

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Abstract: Every individual must pass through the stages of development in the span of his life. Quarter-life crisis is a phenomenon that occurs in early adulthood during the transitional period. The study aims to measure the quarter-life crisis among early adult individuals, aged from 23 to 30 years, and to identify the affecting factors. The data measurement tool is the Quarter-Life Crisis scale. The research results were processed by SPSS 26 software using reliability analysis, descriptive statistics, ANOVA test and independent two sample t-test. A total of 193 individuals filled out questionnaires distributed through social media and printed queries. As the results of the quarter-life crisis scale, 20 subjects (10.5%) were evaluated as high crisis, 115 subjects (54.5%) as medium crisis, and 68 subject (35%) as low crisis. An independent sample t-test was used to analyze whether the quarter-life crisis of the respondents differed according to gender and age, and as the result the P value is close to the level of indicating a significant difference. In other words, when the participants' age is younger, then the quarter-life crisis is high and women suffer from quarter-life crisis at a higher rate than men. An ANOVA test was used to analyze whether the quarter-life crisis of the respondents differed based on their employment status, there wasn't any significant difference. Considering the factors affecting quarter-life crisis, it is observed that 23-30-year-olds tend to compare themselves with others, are not capable of determine their future goals and desires, hesitate when making any decisions, and criticize themselves excessively. Furthermore, financial issues, career planning and social conditions have the main influence on the quarter-life crisis.

Keywords: early adulthood, quarter-life crisis, stage of development

1. Introduction

Many scientists and psychologists have studied various aspects of human development. Every individuals experiences a crisis at some point of transition, depending on their developmental stage and age. A person's life direction is set at a young age and they manage many things at once, such as starting career, finding a life partner, participating in social relations, learning a new profession as well as solving financial problems. A variety of choices and challenges that arise in all areas of life cause early adult individuals to experience quarter-life crisis. People in their 20s and 30s face psychological problems such as anxiety, stress, depression, loneliness, and worry due to not being able to solve their problems properly. The crisis phenomenon that occurs in individuals in the early adulthood phase is often known as the quarter-life crisis.

The quarter-life crisis was first coined by Robbins and Wilner (2001) as a crisis that occurs due to an individual's unpreparedness to transition from adolescence to adulthood. A quarter-life crisis is a period characterized by more difficult, stressful, unstable conditions and is an important turning point in a person's life. The many choices make them feel anxious, depressed, or even feel that life is meaningless (Rahmania & Tasaufi, 2020).

In 2017, The Censuswide on behalf of the LinkedIn conducted an online survey on quarter-life crisis among 6014 individuals aged 25-33 across the United Kingdom, America, Australia and India. As a result, 75 percent of participants have experienced a quarter-life crisis. According to the research results:

- 59% Unsure what to do next in career or life;
- 54% Frustrated about career options;
- 49% Not earning enough money;
- 44% Buying property is out of reach;
- 44% Stuck in difficult situation;
- 43% Haven't traveled enough;
- 35% Under pressure to get married or have a baby;
- 33% Haven't achieved personal goals;
- 32% Not yet pursuing the career they want;

According to the survey conducted by Robbins and Wilner (2004) report that 62% of young people who participated in the study had symptoms of depression and 91% reported that they had symptoms of anxiety. Robinson and Wrig (2013) conducted a survey involving 1,023 individuals in the United Kingdom and as the result 70% of the participants experienced quarter-life crisis when they were in 20s. Although the studies on quarter-life crisis have been conducted internationally in recent years, this type of research is scarce in Mongolia. It is necessary to determine whether early adult individuals are affected by the quarter-life crisis caused by the transition, and how they overcome it.

Aim and objectives of research: The study aims to measure the quarter-life crisis among early adult individuals, aged from 23 to 30 years old, and to identify the affecting factors. In order to achieve the purpose of the research work, the following objectives were set.

1. To study concept and theories about quarter-life crisis;
2. To determine the research methodology and take a survey;
3. The process of consolidating the results;
4. Conclusion;

Methodology:

- Quarter-Life Crisis questionnaire developed by Christine Hassler;
- Google drive platform, printed queries;
- Data analysis on SPSS 26 software;

Importance of the research: By studying the quarter-life crisis in early adulthood, they gain knowledge about the QLC phenomenon and be able to cope with the transitional period. If the affecting factors on the quarter-life crisis are identified, it will open the possibility to expand the necessary measures in the future.

2. Theoretical research

Developmental psychology is the branch of psychology that focuses on the process of human development and their mental characteristic. It is a scientific approach that aims to explain growth, change, and consistency throughout a person's life. These scientists, including Piaget (1967), Erikson (1968), Graves

(1970), Levinson (1976) and Loevinger (1976) explained the stages of human development based on their theories. Although these scholars differ in their views, they agreed that each stage in the lifespan reflects a change in overall mental development. The emergence of a new stage in the process of human development creates a more complex situation, because the features of the previous stage are preserved and based on its foundation, the model for the next stage of development is formed (Graves, 1970).

The German-American psychologist Erik Erikson (1950) was the first theorist who extensively studied the importance of psychological crisis and its significance. Erikson stated that crisis were a normal part of the developmental process and that they were formative in development. It is a period when the “wholeness” of a person is compromised, leading to inner and outer fragmentation. Crisis in the process of human development includes both positive and negative components. If the ego in the previous stage was enriched with new and positive qualities, the conflict was resolved in the right way, then in the current stage it will also have positive components. The creation of positive components in the ego is a guarantee of the healthy development of the individual. If the conflict was insufficiently resolved, negative components of the ego will emerge. It is necessary to resolve each conflict gracefully, and then there will be favorable conditions for moving to the next stage of development (Myagmar, 2013). Caplan (1984) defined the crisis as a period when an individual can discover his potential and personal growth. Every crisis represent both an opportunity for psychological growth or deterioration. It is an intermediate stage in which mental disorder may or may not be avoided. The outcome of the crisis depends on the resolution of complex conflicts during the period of instability (Caplan, 1964, p.53).

According to Arnett, the process of self-identification begins in adolescence and it becomes more intense in early adulthood. For instance, when faced with issues such as career planning and interpersonal relationships, a person becomes more aware of who they are and what they want from life. At this time, early adult individuals explore themselves in many ways, resulting in instability. Creating intimate relationships with others, making independent decisions, entering the workplace and moving away from home are the main factors that cause instability. Instability can lead to mental health problems and increased stress levels. Since American researchers Robbins and Wilner published the book "Quarter-life Crisis: The Unique Challenges of Life in Your Twenties" in 2001, the other researchers have paid great attention to this phenomenon. They defined the quarter-life crisis is a response of facing multiple choices, experiencing instability and coping with life transition changes (Robbins & Wilner, 2001). It is a period of emotional instability and insecurity immediately following the major changes of adolescence, usually occurs between the ages of 21 and 29. Young people in their 20-30's deal with many issues at once, such as changing career plans, finding a life partner, planning a family, actively participating in social relationships and solving financial problems. If early adult individuals do not cope with their problems in the right way, psychological problems such as stress, depression, anxiety as well as insomnia arises.

3. Methodology

The participants involved in this study were 193 individuals. Christine Hassler's Quarter-Life Crisis scale was used to conduct the study. In 2012, Indonesian researcher Inayaah Agustin modified this questionnaire and converted it to a Likert scale model. Quarter-Life Crisis scale consists of 25 questions and there are 7 dimensions.

1. Indecision in making decisions;
2. Hopelessness;
3. Negative self-assessment;

4. Trapped in difficult situations;
5. Feelings of anxiety;
6. Feeling of depression;
7. Feelings of worry about interpersonal relationships;

This questionnaire contains statements about how individuals perceive the uncertainty of the situation around them, namely career planning, interpersonal relationships, education, and financial issues. Each question is scored from 0 to 6 and has six answer choices ranging from 1 (strongly disagree), 2 (agree), 3 (slightly agree), 4 (slightly disagree), 5 (disagree) and 6 (strongly agree). Examples of items include “I am in a funk where I feel like nothing is terribly wrong, but nothing seems right either”, “I overanalyze myself” and “I often feel depressed, anxious, overwhelmed, lost, and maybe even a little hopeless”. A high score indicates that QLC is high and a low score indicates that QLC is low. The result of the reliability analysis of the quarter-life crisis scale show Cronbach’s alpha 0.94 which indicates the research data is sufficiently reliable.

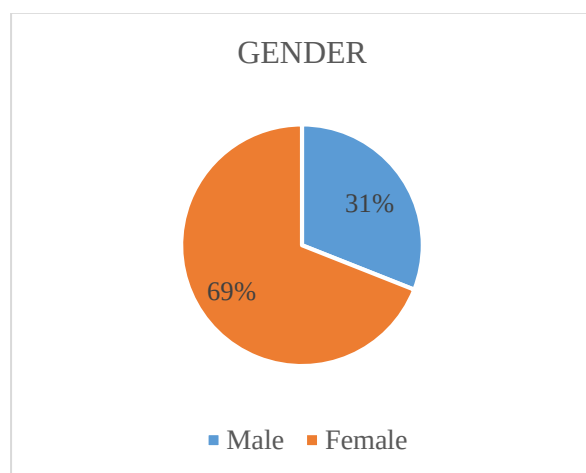
[Table 1] Reliability analysis of the quarter-life crisis scale

Cronbach's Alpha	N of Items
0.94	25

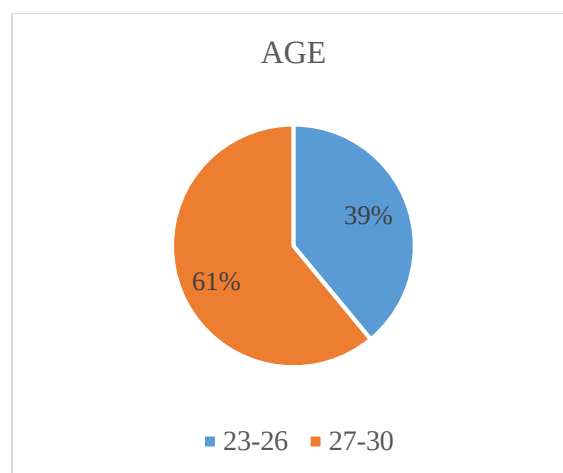
4. Result, Data analysis

The participants in this study were 193 individuals ranging in age from 23 to 30 years old, adjusted to the criteria for early adulthood. The participants’ filled out questionnaires distributed through social media and printed queries. Data collection was carried out for 2 weeks starting from March 10, 2023. The results of the assumption test for normality illustrated that the distribution of the data was normally distributed at 0.2 ($p > 0.05$). The data analysis technique in this study is the parametric statistics, namely the independent two sample t-test and ANOVA test on SPSS 26 software. Based on the descriptive statistics, the distribution of subjects based on gender and age was obtained, as follows:

[Graph 1] Gender



[Graph 2] Age



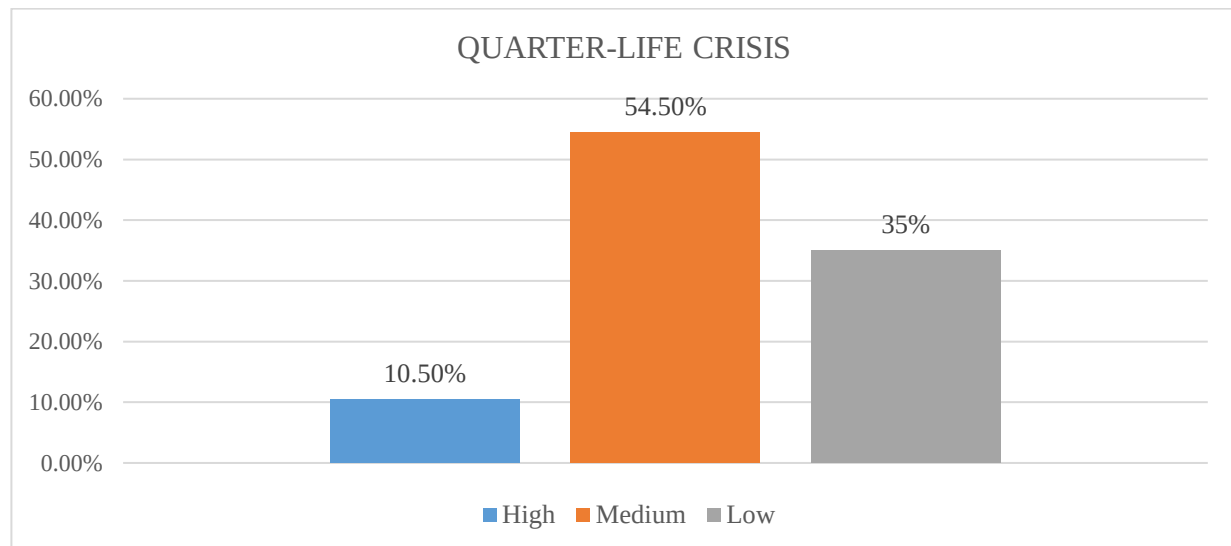
Graph 1 illustrates that the number of female participants was more than male participants, namely 134 subjects (69%) and 59 subjects (31%). Graph 2 illustrates that 27-30 years old participants were the dominant group at 61%, while 23-26 years old participants made up 39%. Descriptive statistics based on employment status can be explained as follows:

[Table 2] Employment status

No	Status	Frequency	Percent (%)
1	Employed	132	68%
2	Unemployed	17	9%
3	Contract worker	6	3%
4	Freelancer	23	12%
5	Others	15	8%

Table 2 indicates that 132 subjects (68%) are employed, 17 subjects (9%) are unemployed, 6 subjects (3%) are contract workers, 23 subjects (12%) are freelancers, 15 subjects (8%) are others. Details of the quarter-life crisis based on categorization can be seen in graph 3.

[Graph 3] Categorization of quarter-life crisis



The purpose of this research is to measure the quarter-life crisis in early adulthood and to identify the affecting factors. The results of score categorization on the quarter-life crisis variable showed that there were 20 subjects (10.5%) in the high crisis, 115 subjects (54.5%) in the medium crisis, and 68 subject (35%) in the low crisis. The average score of quarter-life crisis scale of all the participants is 81 and the participant with the highest score is 141 points and the lowest is 31 points.

The descriptive statistics of the 7 factors contributing to the quarter-life crisis are shown in the table 3. Doubt in making decisions, hopelessness, and negative self-assessment factors have a mean score of 3.4 that is higher, while scores for the other 4 factors range from 3 to 3.1. In other words, it is observed that 23-30 year olds tend to overanalyze themselves, feel that they are not on the same level as their peers, do not know what to do in the future, experience confusion and disappointment, can't achieve their goals and hesitate when making any decisions. Also, financial issues, career paths and social conditions have a major impact on the quarter-life crisis among early adult individuals.

[Table 3] Descriptive analysis of 7 factors on quarter-life crisis

No	Factors	N	Minimum	Maximum	Mean
1	Doubt in making decisions	193	1	6	3.47
2	Hopelessness	193	1	6	3.40
3	Negative self-assessment	193	1	6	3.44
4	Trapped in difficult situations	193	1	5.8	3.09
5	Anxiety	193	1	6	3.16
6	Depression	193	1	6	3.17
7	Interpersonal relationships	193	1	5.75	3.02

An independent 2 sample t-test was used to analyze whether the quarter-life crisis of the participants differed according to gender, and as the result the “Sig. (2-tailed)” value is 0.094, greater than 0.05 which is close to the level of indicating a significant difference. The average score of quarter-life crisis on male participants’ is 77.1 and female participants’ score is 83. Furthermore, the mean difference 5.9 points indicated significantly difference between men and female participants. In other words, it can be concluded that women are affected by quarter-life crisis to a greater extent than men. Details of the quarter-life crisis and gender comparison can be seen in table 4.

[Table 4] A comparison of quarter-life crisis and gender

Variable	Gender	N	Mean	Mean difference	Sig. (2-tailed)
Quarter-life crisis	Male	59	77.1	-5.9	0.094
	Female	134	83		

An independent 2 sample t-test was used to analyze whether the quarter-life crisis of the participants differed according to age, and as the result the “Sig. (2-tailed)” value is 0.085, greater than 0.05 which is close to the level of indicating a significant difference. The average score of quarter-life crisis on 23-26 years old participants’ is 84.7 points and 27-30 years old participants’ score is 79. Furthermore, the mean difference 5.7 points indicated significantly difference between two groups. In other words, where if the participants’ age is younger then the quarter-life crisis is high and vice versa the participants’ age is older, the quarter-life crisis is low. Details of the quarter-life crisis and age comparison can be seen in table 5.

[Table 5] A comparison of quarter-life crisis and age

Variable	Age	N	Mean	Mean difference	Sig. (2-tailed)
Quarter-life crisis	23-26	76	84.7	5.7	0.085
	27-30	117	79		

An ANOVA test was used to analyze whether the quarter-life crisis of the participants based on their employment status, there wasn’t any significant difference in mean points of quarter-life crisis. According to the result, the “Sig. (2-tailed)” value is 0.268 which is greater than 0.05 that means the average score of

the quarter-life crisis was not significantly different regardless of whether the participant was employed, unemployed, contract worker, freelancer or others. Details of the ANOVA analysis can be seen in table 6.

[Table 6] ANOVA analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2668.89	4	667.22	1.31	0.268
Within Groups	95702.43	188	509.05		

The table 7 illustrates that the average score of quarter-life crisis for employed youth is 81, unemployed youth 91, contract workers 86, freelancer 77 and for other participants the average score is 75 points. According to ANOVA analysis, the mean scores of participants' indicated no significant difference regardless of employment status.

[Table 7] A comparison of quarter-life crisis and employment status

Type	N	Mean	Lower Bound	Upper Bound	Minimum	Maximum
Employed	132	81	77.06	84.93	32	141
Unemployed	17	91.47	81.46	101.48	43	120
Contract worker	6	86.16	69.64	102.68	58	101
Freelancer	23	77.73	66.08	89.39	31	138
Other	15	75.73	66.55	84.910	51	118

5. Conclusion

Early adulthood is an important period in an individual's life that brings many challenges and creates one's own future. The quarter-life crisis is a crisis in early or emerging adulthood characterized by feelings of confusion, frustration, panic, helplessness, lack of enthusiasm, and loss of direction. The study aims to measure the quarter-life crisis among early adult individuals, aged from 23 to 30 years, and to identify the affecting factors. 193 individuals participated in the study and the results were statistically processed by SPSS26 software. The results of this study illustrates that 10.5% of the participants is experiencing high level of quarter-life crisis, 54.5% is in moderate and 35% is in low. An approximately 65% of the subjects involved in the study were in a moderate to high quarter-life crisis phase. It indicates that there is a need to spread awareness about this phenomenon to the public. If early adult individuals have more knowledge about the quarter-life crisis, they will be able to overcome the crisis in the suitable way. Furthermore, an independent sample t-test was used to analyze whether the quarter-life crisis of the participants differed according to gender and age, and as the result the P value is close to the level of indicating a significant difference. In other words, the quarter-life crisis among 23-26 year olds participants' is higher than 27-30 year olds participants. In addition, women tend to experience more quarter-life crisis than men. Maybe it is related to the demands on women have children, take care of the family, have good financial conditions and

build social relations. It is observed that 23-30 year olds tend to overanalyze themselves, doubt their abilities, feeling they are not on the same level as their peers, confusion about making the right decisions and not being confident in their life plans and goals. The result of the study indicates that it is necessary to spread public awareness about quarter-life crisis. If young generation have knowledge about the quarter-life crisis, they will be able to overcome the crisis in the right and quick way.

REFERENCES

- [1] Agustin, I. (2012). *Therapy with Solution-Focused Approach for Individuals Who Experienced*. Universitas Indonesia.
- [2] Arnett, J. J., & Tanner, J. L. (2006). *Emerging Adults in America Coming of Age in the twenty first Century*. Los Angeles.
- [3] Batbold, Sh. (2022). *Psychology of life I*. Ulaanbaatar: Tepe
- [4] Batsaikhan, B & Delgerjav, M. (2013). *Glossary of Psychology*. Ulaanbaatar.
- [5] Hassler, C. (2009). Are you having a quarter-life crisis? *The Huffington Post*. <https://www.huffpost.com/>
- [6] Myagmar, O. (2013). *Lectures on the psychology of human development*.
- [7] Rahmania, F. A., & Tasaufi, M. N. F. (2020). *Terapi kelompok suportif untuk menurunkan quarter-life crisis pada individu dewasa awal di masa pandemi covid-19*. PSISULA: Prosiding Berkala Psikologi.
- [8] Robbins, A., & Wilner, A. (2001). *Quarterlife crisis: The unique challenges of life in your twenties*. Penguin Putnam Inc.
- [9] Robinson, O., C., Wright, G. R. T., & Smith, J. A. (2013). *The Holistic Phase Model of Early Adult Crisis*. *Journal of Adult Development*. 20, 27-37.
- [10] Robinson, O. C., & Wright, G. R. T. (2013). *The prevalence, types, and perceived outcomes of crisis episodes in early adulthood and midlife: A structured retrospective-autobiographical study*. *International Journal of Behavioral*.

SSBA-30

Some of the supply chain issues and challenges for food production in rural regions in Mongolia

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Abstract: The problem of food for the population has been becoming a global problem, including the quality, hygiene and supply of food products. Therefore, we have studied the supply system of micro, small, and medium producers operating in the field of food production in Darkhan-Uul Province, and studied the opportunities, challenges, and requirements of supplying products to large chain stores operating in the region. According to our research, food manufacturers produce 15 types of products including bakery 20.3%, dumpling 18.2%, semi-finished meat products 8.4%, sliced flour 7.7%, honey 6.3%, cake bakery 5.6%. Moreover, 66.7 percent of the food producers of Darkhan-Uul province cannot meet the requirements of chain stores, 33.3 percent of them cannot supply their products due to low capacity, large volume, inability to continuously supply products, low working capital and other factors.

Keywords: production, sale, fund, requirement

1. Introduction

This research has been done in order to study the supply system of micro, small and medium producers operating in the field of food production in Darkhan-Uul province, and to study the possibilities, challenges and requirements of supplying products to large chain stores operating in the region, the food industry operation. The survey was conducted with 100 industrial business owners and managers of 7 chain stores that supply products.

Research methods:

- In this research we carried out in accordance with:
- Being cross independent;
- Adhere to scientific and professional methodology at all stages of research;
- The principle that the results of the research should be meaningful and directly applicable to the activities.

Sampling and survey performance:

In this study, we used the target sampling method and collected enterprise data from the Darkhan-Uul Province Department of food and Agriculture and some professional associations. Thus, quantitative and qualitative data were collected through face-to-face interviews with developed questionnaires. In carrying out this study, we conducted a qualitative study with the management and managers of food manufacturers and chain stores, in accordance with Article 5.4 of the Personal Privacy Act and Article 5.2 of the Organizational Privacy Act.

Furthermore, the survey data and information obtained from the producers were compiled using the SPSS program, comparison, alignment, analysis, summarization, table and graphic methods were used for processing in terms of the quantitative research method.

A qualitative research was conducted with the manager of a chain store using the method of focus interviews, comparison, alignment, analysis, summarization, tables and graphs.

2. Survey Research

According to World Bank research, small and medium enterprises alone account for 40% of employment and up to 60% of gross domestic product (GDP) in developing countries. Therefore, intensive support and policy development of the SME sector is the main pillar of inclusive economic growth while increasing employment and reducing poverty [1].

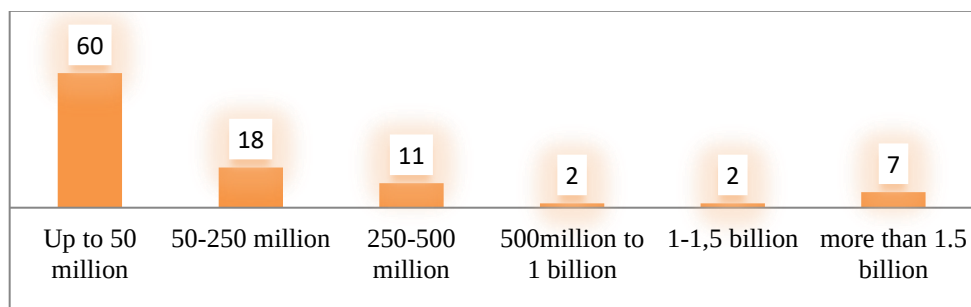
As of 2022, a total of 105 enterprises and organizations have been operating in the food sector in Darkhan-Uul province. Considering the activities of these organizations, there are 2 slaughterhouses, 3 sausage factories, 33 meat processing plants, 7 milk and dairy products, 3 flour, 38 bread and bakery products, 3 canned products, 4 bottled water plants, 1 edible mushroom plant, and 1 sea buckthorn juice plant, 3 honey enterprises in this region. Besides meat, meat products, and milk and dairy products factories with perishable food products from provincial producers have introduced refrigerated equipment in the stages of transportation and sale by means of special vehicles at their branded goods points. Moreover, there have been a total of 91 vehicles including 38 special purpose vehicles, 35 passenger cars, and 15 trucks are used in the food industry [2].

As part of the "Research on the impact of Covid-19 on the supply chain of agricultural products in Mongolia", the current situation of the supply chain of agricultural products in Mongolia and the impact of the Covid-19 pandemic have been clarified, and the problems facing the agricultural supply chain have been identified [13].

3. Methods

The research result

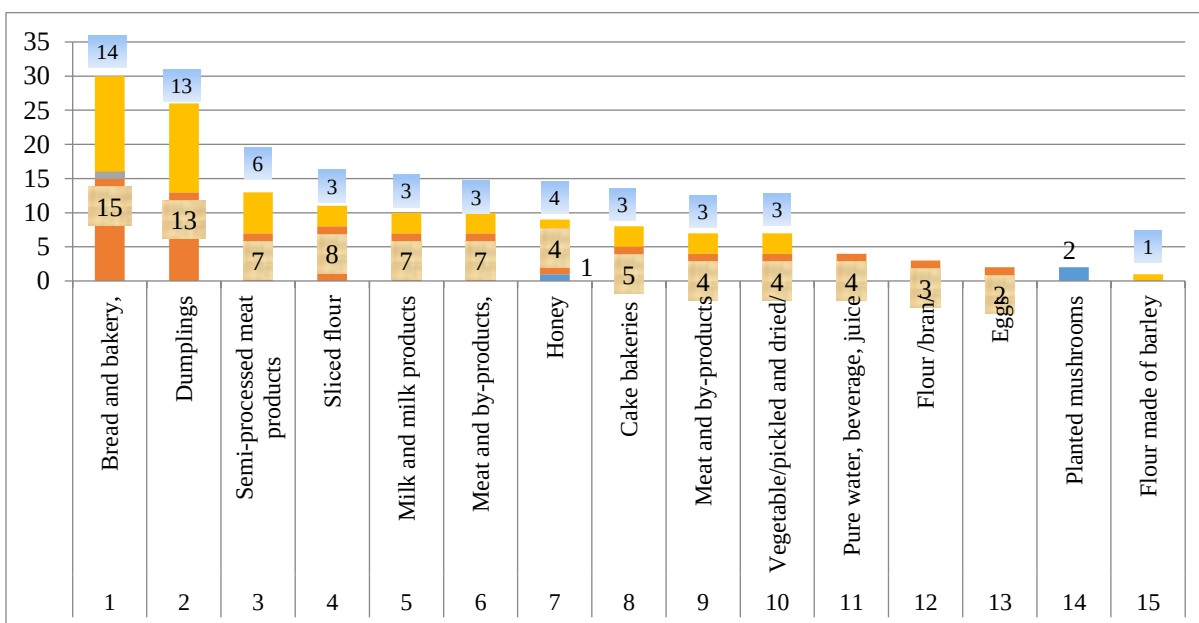
In this survey there are 1 JSC, 54 LLC, 42 unregistered business owners, 3 cooperatives, or a total of 100 food producers participated. If we regard the age and gender composition of the respondents, there were 21 men and 79 women aged 25-70. SMEs, which produce food that participated in our study, 60 are up to 50 million MNT, 18 are 50-250 million MNT, 11 are 250-500 million MNT, 2 are between 500 million to 1 billion MNT, 2 are 1-1.5 billion MNT, 7 have an income of more than 1.5 billions. Figure 3



[Figure 1] Business income status of respondents

4. Results, Data Analysis

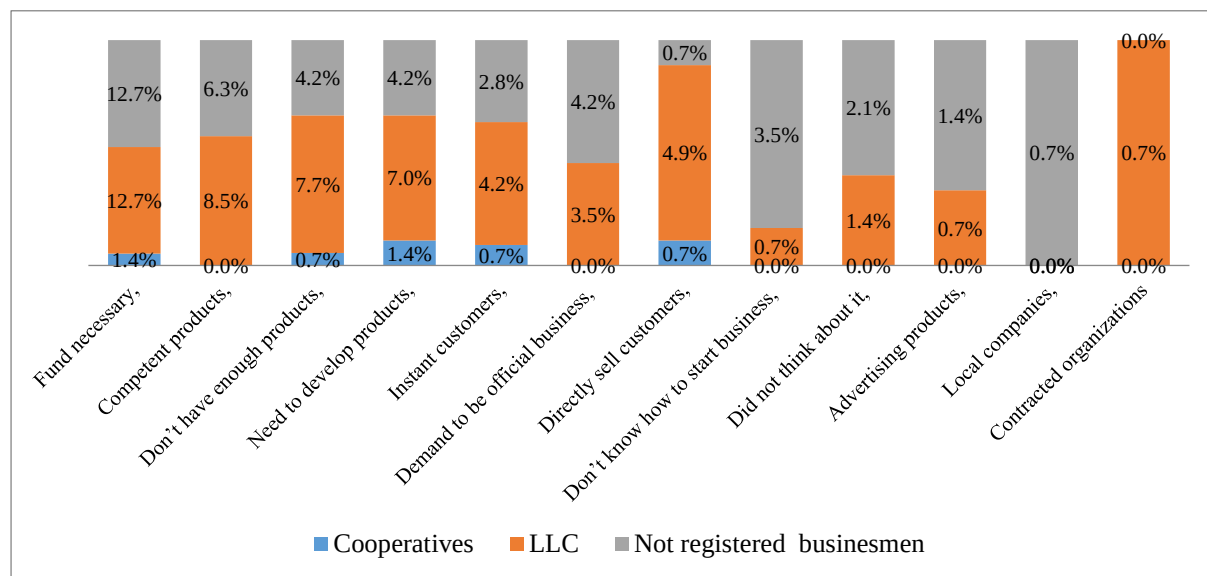
When examining the number of employees of the surveyed food producing SMEs, 46% have 1-5 employees, 26% have 6-10 employees, 15% have 11-15 employees, 5% have 16-20 employees, 3% have 21-25 employees and 5% has 60-160 employees. Thus, it can be seen that most of them, 72%, are micro, 23% are small, and 5% are medium enterprises. Additionally, entrepreneurs engaged in food production of Darkhan-Uul province, produce 15 types of products, 29 or 20.3% are bakery products, 16 or 18.2% are dumplings, 8.4% are semi-processed meat products manufacturers, and 7.7% are flour manufacturers, honey producers 6.3%, and cake bakeries 5.6%. Figure 2



[Figure 2] Product range of food producers

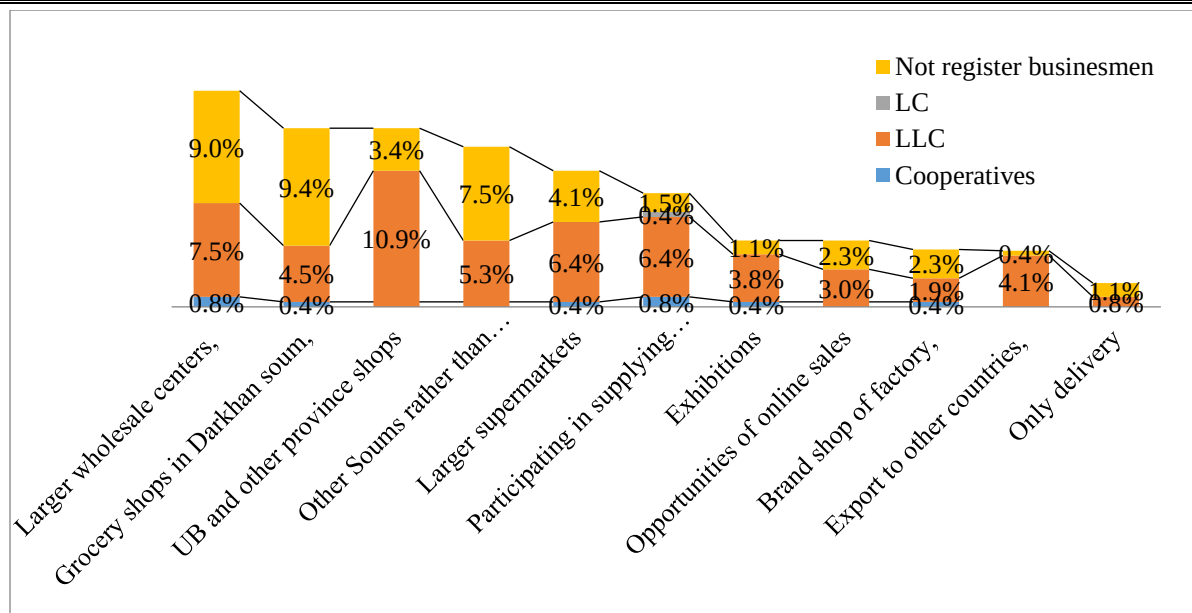
The small and medium businessmen who participated in the study sell their products in the market through 10 channels, 28.8% of them are in food stores of Darkhan Soum, 19.2% are in large food markets (Darkhan Market, ICT), and 14.4% are in food stores other than Darkhan Soum, in other stores, 8.5% are sold at Factory boutiques, counters, service centers, etc. Cooperatives usually sell using online trading facilities, while unregistered entrepreneurs and LLCs and JSCs sell products through the channels of major food markets /Darkhan Market, ICT-/ , food stores in Darkhan Soum, and food stores in Soums other than Darkhan Soum. 2.2% of unregistered entrepreneurs and 5.9% of LLCs are selling through factory boutiques and counters. Through clarifying the reasons why products are not supplied to wholesale centers, supermarkets, and shopping centers, 2% of cooperatives need to develop their products and need financing, 1% have regular buyers, selling directly to buyers keeps the price of products normal, and they do not have enough capacity to cope with demand. 12.7% of LLCs are in need of financing, 8.5% because there are many competing products, and they don't think there is enough demand, and 7.7% because they don't have enough capacity to meet the demand have covered much reasons. 12.7% of unregistered entrepreneurs said that they needed financing, 6.3% said that they did not consider that the demand was sufficient because

there were many competing products, and 6% said that they did not have enough capacity to meet the demand, they needed to develop their products, and they wanted to be an official business reasons are mentioned. Figure 3.



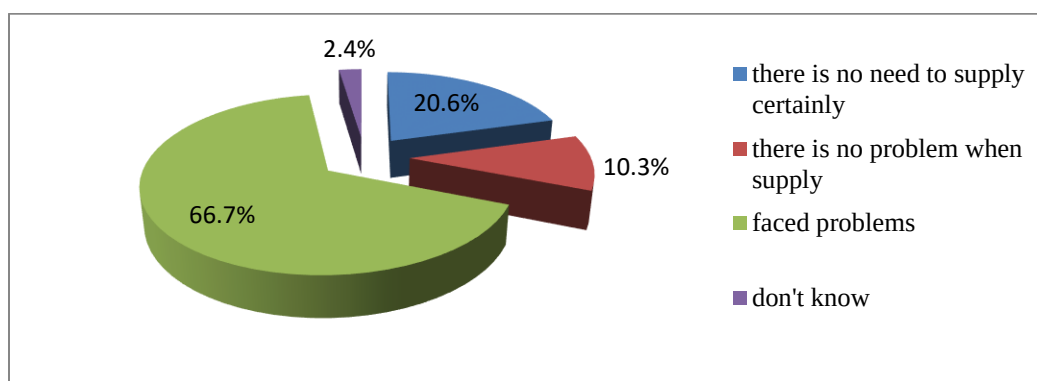
[Figure 3] Reasons for non-delivery to wholesale centers, supermarkets, and shopping centers

Additionally, there are SME owners who are interested in selling more products 46 or 17.3% to the large wholesale centers and supermarkets in Darkhan Soum, 38 or 14.3% are to large wholesale centers and supermarkets in Ulaanbaatar and other provinces, and food stores in Darkhan Soum, and 34 or 12.8% to Darkhan in grocery stores in Soum and out of Soum. As a consequence, there are 2 cooperatives, 20 limited liability companies, and 24 unregistered entrepreneurs who are interested in increasing their product sales in large wholesale centers and supermarkets in Darkhan Soum. However, there are 12 LLCs and 25 unregistered entrepreneurs who are interested in increasing their sales at Darkhan Soum grocery stores. There are 29 LLCs and 9 unregistered entrepreneurs who are interested in increasing their sales through large wholesale centers and chain supermarkets in Ulaanbaatar city and other provinces, and there are 14 LLCs and 20 unregistered entrepreneurs who are interested in increasing their sales in grocery stores in Soum and out of Darkhan Soum. Figure 4.



[Figure 4] Opportunities to increase product sales

Out of the 100 SMEs surveyed, 126 suggestions were received, 26 or 20.6 percent said that it is not necessary to supply products to large supermarkets and chain stores, 13 or 10.3 percent did not have any problems with supply, 3 or 2.4 percent did not know, and the remaining 66.7% cannot meet the requirements set by the store (VAT, packaging requirements, bar code, analysis letter/), store planning and organization, seller's relationship attitude, experience, product increase, return, difficulty in calculating, the factory's own capacity unable to supply products due to the inability to continuously supply products in small or large quantities and low working capital. In addition, it was believed that the fact that the chain stores provide the sales revenue of the supplied SMEs after 15-30 days contributes to their lack of working capital. Figure 5.



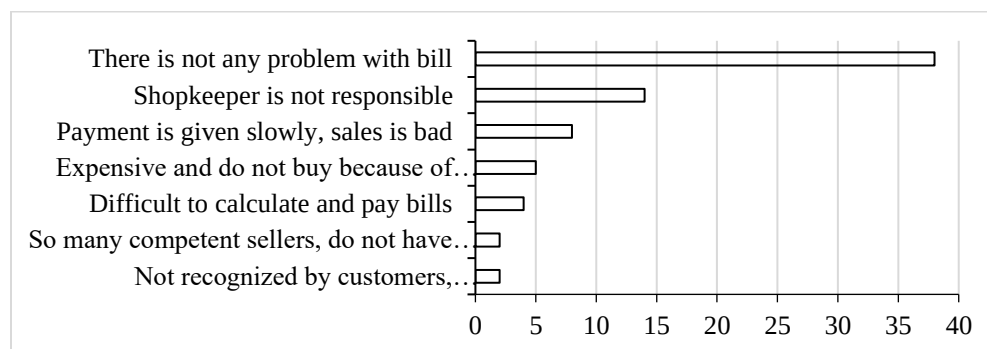
[Figure 5] Supply chain problems with Nomin and Orgil center

The problems faced by food industries in supplying their products in chain stores can be classified as follows. Table 1.

[Table 1] Supply chain problems with Nomin and Orgil center

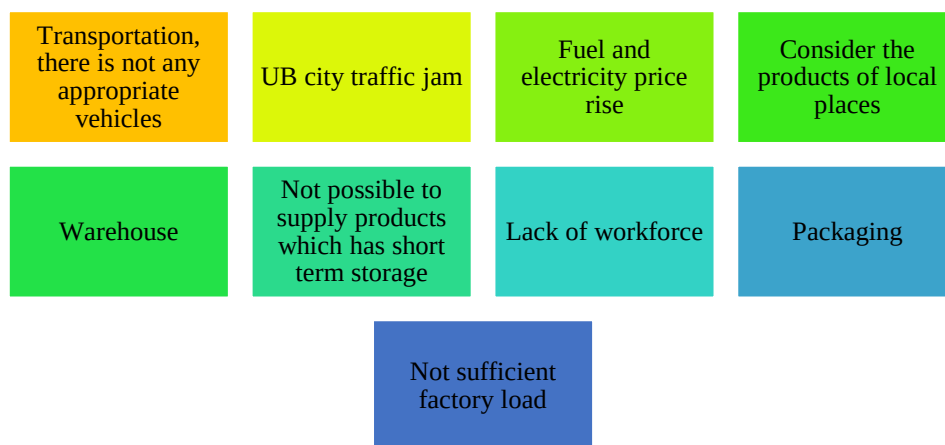
	Faced challenges	Included problems
1	Can't meet the demands of chain stores	The product must have a barcode
		Must have VAT
		Packaging should be standardized
		Do not buy products with a short shelf life
2	Institutional factors	Small capacity
		Cannot be supplied in large quantities and continuously
3	Store planning, organization and human resource issues	Product sales are calculated once a month
		It is slow to enter the price of new goods, and it is difficult to calculate
		Insufficient production arrangement
		Many documents are required. Goes to UB making contract, but does not receive a reply
		Bureaucratic
		Poor attitude of the shop assistant
		Poor knowledge and experience of trade consultants
		Poor storage and refrigeration
4	Other problems	There was a problem that the ordered goods were sold at a price difference
		UB sells domestic and imported products

As well as 32.2 percent of the SME owners believed that they have some problems in supplying products to local large supermarkets and 8 food boutiques, 12.2 percent did not need to supply goods, 3.5 percent did not know, and the remaining 52.2 percent found it difficult. SMEs cannot meet the requirements of being a VAT payer, being an official enterprise or company, having a patent, and packaging requirements set by local store management. Also, it is difficult to communicate with shopkeepers and make calculations, and products are not supplied because the refrigerators and freezers for storing the products in the store do not meet the requirements. In addition, entrepreneurs are unable to meet demand due to insufficient capacity, lack of premises, lack of financing, and lack of transportation to supply their products to stores. Figure 6.



[Figure 6] Problems with product delivery

In fact, 51.2 percent of the SMEs that participated in our survey believed that it is not necessary to supply products to large wholesale centers and chain supermarkets in Ulaanbaatar and other provinces. 14.0 percent believed that there is no problem with supply, and these organizations sell their products under contract to Nomin and Orgil chain stores in Ulaanbaatar, Khuvsgul, Uverkhanga, Orkhon, Gobi-Altai, Khuvsgul provinces, and large wholesale centers and chain supermarkets. However, the remaining 34.9 percent of the problems faced in supplying to large wholesale centers and supermarket chains in Ulaanbaatar city and other provinces are due to lack of transportation and dedicated vehicles, congestion in Ulaanbaatar city, increase in the price of fuel and electricity, the perception of local products, storage tanks and storage facilities, inability to supply short-term products, insufficient labor force, inadequate packaging, and insufficient factory capacity are mentioned. Figure 7



[Figure 7] Product supply problems

In order to overcome the above-mentioned problems, it was considered necessary to solve the problems of discounted loans, financing, local support, training, advice, jobs, equipment, support for start-up entrepreneurs, tax relief, VAT, Social Insurance fee, transportation and distribution. Besides we conducted a group interview with more than 30 representatives of the management positions of organizations such as Orgil chain store, Nomin chain store Darhan branch, Egg mart store, Khushlen wholesale store, APPOLO store, My store, etc. discussed the problems and possible solutions. According to the quality research, requirements such as VAT, product bar code, packaging, quality assurance, product useful life, product delivery time, test report, and regular supply are set. Table 2.

[Table 2] Goods from chain stores supply requirement

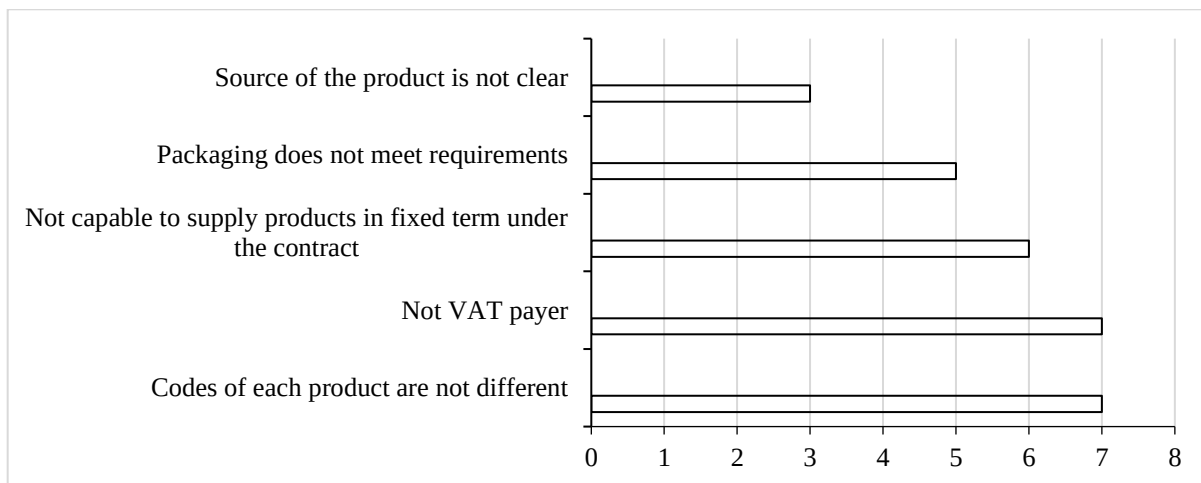
№	Product requirements	Shops						
		1	2	3	4	5	6	7
1	To have VAT	+	+	+	+	+	+	+
2	Bar code	+	+	+	+	+	+	+
3	Package	+	+	+	+	+	+	+
4	Quality assurance	+	+	+	+			
5	Cheap cost			+			+	

6	The term of the goods		+	+	+		+	
7	Delivery time	+	+	+				
8	Analysis paper		+	+		+	+	
9	Quotation	+					+	
10	Contant supply			+	+	+		
11	Return of goods				+			
12	The origin must be clear						+	

About 30 percent of bread and pastry factories, honey producers, flour, egg, dumpling and buuz producers meet the above requirements of chain stores and supply their products. As for store management, local SMEs supplying products to the store have smooth and sustainable food manufacturers that meet our requirements and supply their products. However, for small and micro business owners, there are the following problems including:

What requirements are not met by local manufacturers

Moreover, there are many companies and organizations that regularly and continuously supply products to chain stores. However, in some SMEs, for citizens, the factory capacity is low, the products do not have barcodes, although there are codes, they are not different for each type of product, there is not any VAT, and some products packaging does not meet the requirements which must be packed, some goods are packed in plastic bags. In this way it is not fulfilled the requirements in the contract. Therefore, in order to solve the above-mentioned problems, it can be mentioned here that there is an opportunity for the producers of similar products to cooperate and form a cluster. Cooperation with stores seems possible. Finally, the survey revealed that citizens who are not registered as partners and are operating as citizens need to cooperate, coordinate, diversify, and meet standard requirements.



[Figure 8] Factors that food producers cannot meet the requirements of chain stores

4. Conclusion

1. Firstly, food producers of Darkhan-Uul province produce 15 types of products, bakery 20.3%, dumplings 18.2%, semi-processed meat products 8.4%, cut flour producers 7.7%, honey manufacturers accounted for 6.3%, cake bakeries accounted for 5.6%.
2. Secondly, 66.7 percent of the food producers of Darkhan-Uul province cannot meet the requirements of chain stores (VAT, packaging requirements, bar codes, and analysis letters/), store planning, organization, salesperson's attitude, experience, product sales, returns, and billing. They are unable to supply their products due to the difficulty of supply, the inability of the factory to supply products in large quantities and continuously, and the lack of working capital.
3. Third, 34.9% of the food producers of Darkhan-Uul province has faced problems in supplying to large wholesale centers and supermarket chains in Ulaanbaatar and other provinces due to the lack of transportation and dedicated vehicles, congestion in Ulaanbaatar, the increase in the price of fuel and electricity, and the perception of local products. Storage containers, inability to supply products with a short shelf life, insufficient labor force, inadequate packaging, and insufficient factory capacity are mentioned.
4. Furthermore, chain stores have requirements such as VAT, product barcodes, packaging, quality assurance, product shelf life, product delivery time, test report, and regular delivery.
5. Finally, we consider that consumers of Darkhan-Uul, Selenge, and Bulgan provinces have been buying imported and Ulaanbaatar products as the food producers of Darkhan-Uul province do not study their customers well, they cannot reflect the characteristics of their competitors in their products, product development is not done well, and they have not learned how to properly manage their business.

References

- [1] Report of the Department of Food and Agriculture of Darkhan-Uul province, 2022 Darkhan-Uul province.
- [2] Bank of Mongolia Small and medium industry development and financing status, Ulaanbaatar 2018.
- [3] National Statistical Office. "Mongolia-Census of Business Entities and Organizations," Ulaanbaatar 2020.
- [4] National Statistical Office. "Mongolia-Census of Business Entities and Organizations," Ulaanbaatar 2021.
- [5] G. Doojav. D. Luvsannyam. B. Sukhbaatar "Development and access to finance of small and medium-sized enterprises in Mongolia," 2020.
- [6] Ch.Narantsetseg, Anna Dunay, Ts. Nyamdulam The role of information technology for small medium enterprises: focusing on vehicle companies in Mongolia, 2021.
- [7] National Statistical Office. "Gross domestic product," Ulaanbaatar 2021.
- [8] National Statistical Office. "The Coronavirus and the Economy," Ulaanbaatar 2021.
- [9] Bank of Mongolia. "Development and financing of small and medium enterprises," Ulaanbaatar 2019.
- [10] Bank of Mongolia. "Contribution of small and medium enterprises to economic development," Ulaanbaatar 2021.
- [11] Darkhan-Uul province Statistics Department. Socio-economic status of Darkhan-Uul province, Darkhan-Uul province 2022.
- [12] <https://mirim.mn/?p=1865>
- [13] <https://medee.nso.mn:3005/api/articles/imagesCk/1675744865166-nso-%D0%A2%D0%90%D0%9D%D0%98%D0%9B%D0%A6%D0%A3%D0%A3%D0%9B%D0%93%D0%90-2022-%D0%BE%D0%BD.pdf>
- [14] <https://www.sciencedirect.com/science/article/abs/pii/S0925527316000578>

SSBA-31

A study of the current state of depreciation of non-current assets

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Abstract: The research aims to assess non-current asset depreciation policies in enterprises and organizations in Mongolia through two main parts: a questionnaire survey and a case study. The survey involved 35 organizations, revealing that most organizations calculate depreciation and amortization of non-current assets according to the Corporate Income Tax Law and not the International Financial Reporting Standards. This raises doubts about the quality of information in financial statements, attributed to lack of time for "Report on differences between financial and tax statements (ST-30)" preparation and immature non-current asset accounting. The case study involved one organization selected from the surveyed organizations. Its 180 non-current assets were updated based on consultation with relevant officials on service life, residual value, and depreciation methods as required by international financial reporting standards. The updated depreciation costs for the last three years significantly differed from the original reports, raising questions about the quality of information in the organization's financial statements and its potential impact on decision-making by information users.

Keywords: non-current assets, depreciation, IFRS, tax law legislation

1. Introduction

Background: Despite efforts to implement international financial reporting standards (IFRS) in Mongolia, the quality of financial reports is insufficient according to previous research conducted by PhD. Gantulga G., PhD. Chimedsuren Ch., and the Foundation for the Development of Accounting (Г.Гантулга, 2018) (Нягтлан бодох бүртгэлийн хөгжүүлэх сан, 2015) However, there has been no in-depth study of non-current assets, specifically International Accounting Standard 16 *Plants, Property and Equipment* and International Accounting Standard 38 *Intangible Assets*.

Significance: This research is the first in Mongolia to determine the current state of the implementation of IAS 16 and IAS 38 standards through questionnaires and case studies, making it an innovative and significant study.

Research status: While there are research activities aimed at evaluating the implementation of IFRS and the quality of financial reporting information, there is no study in Mongolia that evaluates the implementation of IAS 16 and IAS 38 standards in detail.

Purpose: The purpose of this research is to determine the accounting policies followed by enterprises and organizations in Mongolia when calculating the depreciation and amortization of non-current assets.

Scope: This study focuses on the elements required to calculate the depreciation and amortization of non-current assets, including the useful life of the asset, residual value, and the choice of depreciation method, by the cost model defined in IAS 16 and IAS 38 standards.

Methodology: The research consists of two main parts. First, a questionnaire survey consisting of 16 questions will be administered to enterprises, with data collected via random sampling. Second, one organization will be selected from the surveyed enterprises, and the depreciation and amortization of its non-current assets will be analyzed by the requirements of IFRS. Data will be collected through documentary and interview methods.

2. Survey research

2.1. Conceptual Framework

The Law on Accounting / revised on June 19, 2015/ declares the following about compliance with IFRS. It includes:

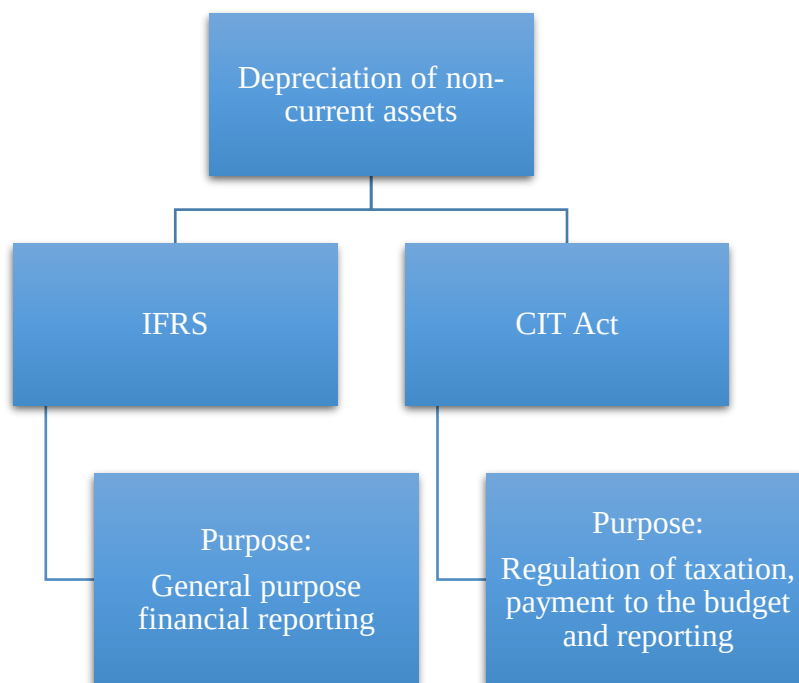
2.1.1. Enterprises and organizations shall comply with the following accounting standards:

2.1.1.1 International financial reporting standards;

2.1.1.2 International financial reporting standards for small and medium-sized enterprises and organizations;

2.1.1.3 International accounting standards for the public sector.(Монгол улсын их хурал, 2015)

The main purpose of the Corporate Income Tax Law, which applies to IFRS and the Tax Package Law of Mongolia, is to:



[Figure 1] Types of non-current asset depreciation

(IFRAC, 2022) (Монгол улсын их хурал, 2020)

[Table 1] Differences between IFRS and CIT Act

Indicator	IFRS	CIT Act
Purpose	The objective of this Standard is to prescribe the accounting treatment for property, plant and equipment so that users of the financial statements can discern information about an entity's investment in its property, plant	1.1. The objective of this law is to regulate relations related to the imposition of corporate income tax, and the payment, and reporting of the tax to the budget.

	and equipment and the changes in such investment. The principal issues in accounting for property, plant and equipment are the recognition of the assets, the determination of their carrying amounts and the depreciation charges and impairment losses to be recognised in relation to them																					
Depreciation method	60. The depreciation method used shall reflect the pattern in which the asset’s future economic benefits are expected to be consumed by the entity. 61. The depreciation method applied to an asset shall be reviewed at least at each financial year-end and, if there has been a significant change in the expected pattern of consumption of the future economic benefits embodied in the asset, the method shall be changed to reflect the changed pattern. 62. ... The entity selects the method that most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. That method is applied consistently from period to period unless there is a change in the expected pattern of consumption of those future economic benefits.	17.3. Depreciation and amortization of assets shall be established by the straight-line method.																				
Usage lifetime	57. The useful life of an asset is defined in terms of the asset’s expected utility to the entity. The asset management policy of the entity may involve the disposal of assets after a specified time or after consumption of a specified proportion of the future economic benefits embodied in the asset. Therefore, the useful life of an asset may be shorter than its economic life. The estimation of the useful life of the asset is a matter of judgement based on the experience of the entity with similar assets.	17.1. Depreciation and amortization of assets used by taxpayers for one or more years are calculated as follows: <table><tr><td>1</td><td>Property and landscaping</td><td>40</td><td>25</td></tr><tr><td>2</td><td>Equipment</td><td>10</td><td></td></tr><tr><td>3</td><td>Computers, peripherals, and software</td><td>2</td><td></td></tr><tr><td>4</td><td>Intangible assets with a definite useful life /This includes special licenses for mineral exploration and exploitation./</td><td>During the validity period</td><td></td></tr><tr><td>5</td><td>Other assets</td><td>10</td><td></td></tr></table> 17.2. Depreciation and amortization are not calculated as a result of the additional part of the asset revaluation.	1	Property and landscaping	40	25	2	Equipment	10		3	Computers, peripherals, and software	2		4	Intangible assets with a definite useful life /This includes special licenses for mineral exploration and exploitation./	During the validity period		5	Other assets	10	
1	Property and landscaping	40	25																			
2	Equipment	10																				
3	Computers, peripherals, and software	2																				
4	Intangible assets with a definite useful life /This includes special licenses for mineral exploration and exploitation./	During the validity period																				
5	Other assets	10																				
Residual value	The residual value of an asset is the estimated amount that an entity would currently obtain from disposal of the asset, after deducting the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life.	Not mentioned.																				

Law on Accounting

2.1.2 Enterprises and organizations shall comply with the following accounting standards:

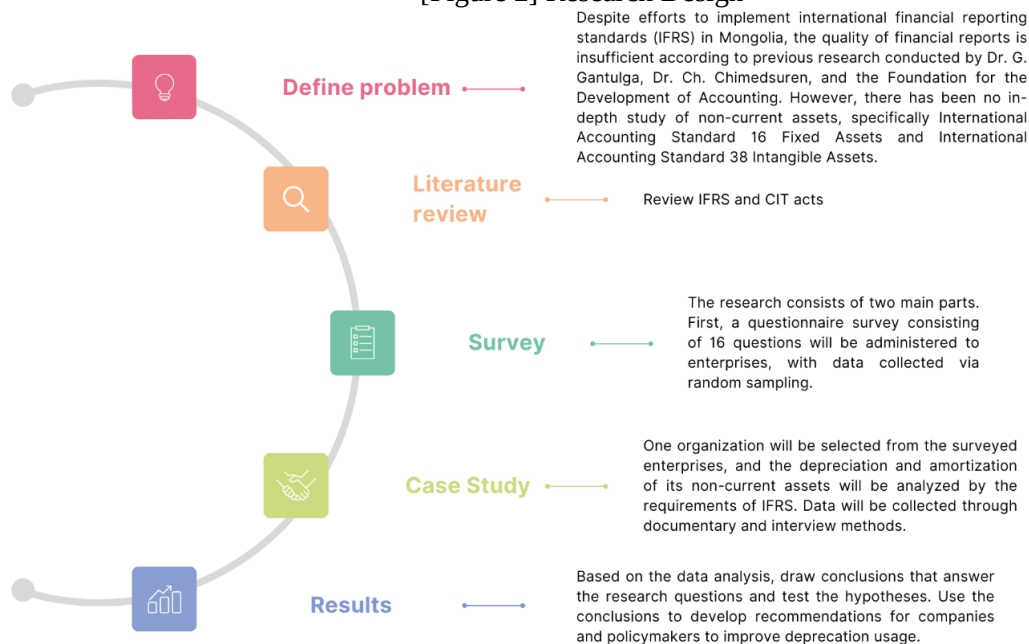
2.1.2.1 International financial reporting standards;

2.1.2.2 International financial reporting standards for small and medium-sized enterprises and organizations;

2.1.2.3 International accounting standards for the public sector.

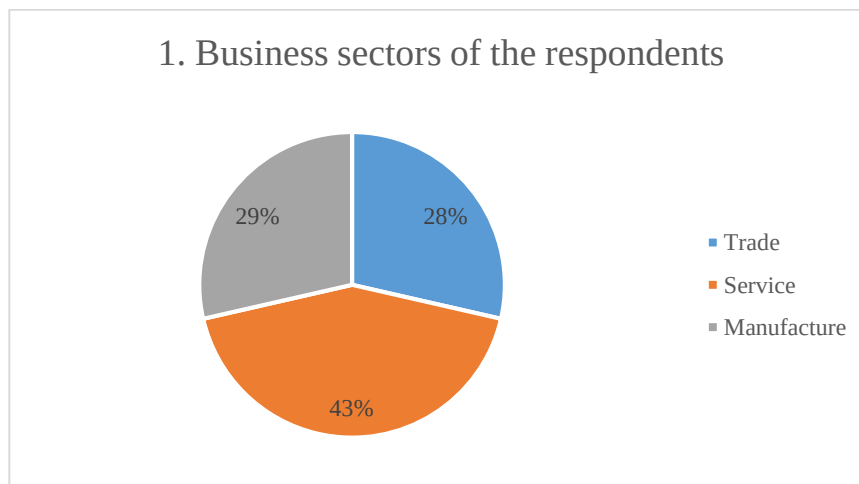
3. Research design

[Figure 2] Research Design

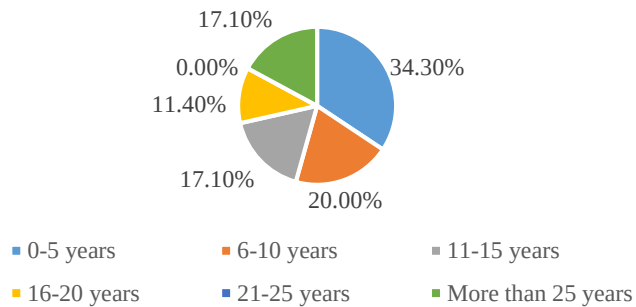


4. Results, Data Analysis

4.1. Survey results



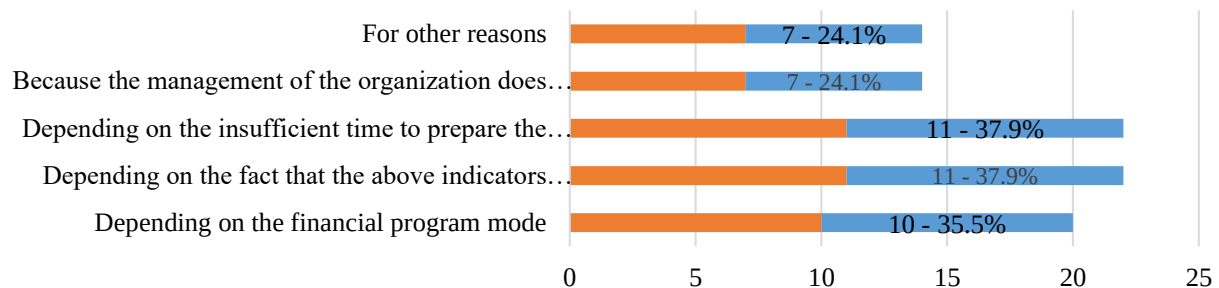
2. Years in operation of respondents



[Table 2] Survey of depreciation

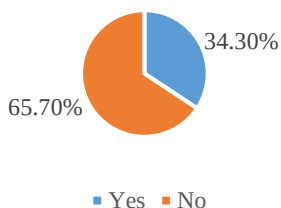
Asset class	Specifications	According to IFRS	According to the CIT Act
Property and landscaping	Usage lifetime	34%	66%
	Depreciation method	26%	74%
	Residual value	37%	63%
Vehicle, mechanisms, industrial equipment	Usage lifetime	34%	66%
	Depreciation method	26%	74%
	Residual value	37%	63%
Computers, peripherals, and software	Usage lifetime	40%	60%
	Depreciation method	29%	71%
	Residual value	31%	69%
Intangible assets	Usage lifetime	43%	57%
	Depreciation method	31%	69%
	Residual value	34%	66%
Other types of assets	Usage lifetime	31%	69%
	Depreciation method	20%	80%
	Residual value	26%	74%

1.6. If your organization determines the above indicators of depreciation and amortization of non-current assets in accordance with the CIT law, please state the reasons. /You can choose more than one option/

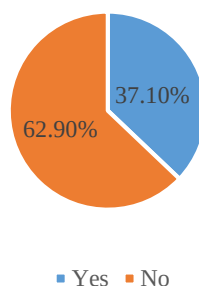


Based on the above research, it was determined that the usage lifetime of non-current assets is 60-69%, 69-74% according to the depreciation method, and 63-74% according to the residual value according to the CIT Tax Law. It can be seen that more than 60% of the surveyed organizations determine their indicators according to the CIT Law. When clarifying the reasons for this, 37.9% answered that the non-current asset accounting is not mature enough, and 37.9% said that it depends on insufficient time to prepare the report (ST-30) for adjusting the difference between the indicators of the financial and tax reports.

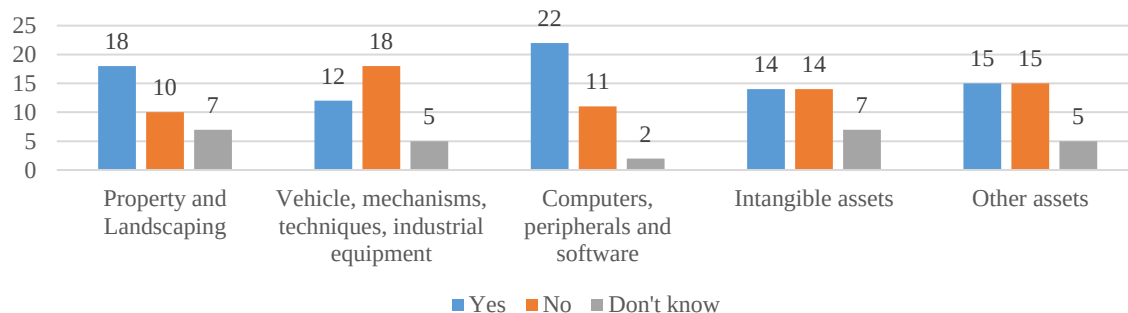
3. Does your organization have non-current assets that have been depreciated but are still in use?

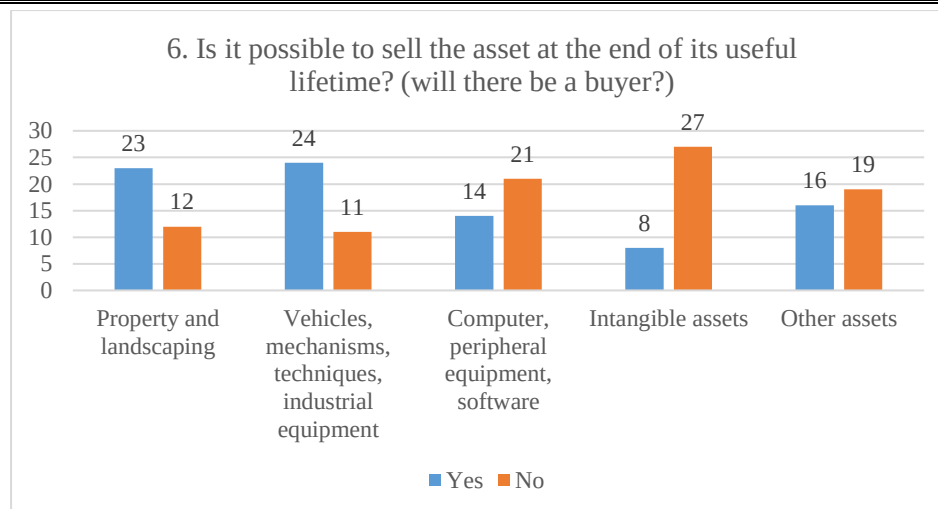


4. Is the lifetime defined by the tax law different from the one defined by your organization?



5. Is your organization's economic return on non-current assets the same every year?





In total, 65.7% of respondents said that they continue to use their depreciated non-current assets, and 62.9% said that they differ from the usage lifetime specified in the tax law. Also, it is said that the economic return from non-current assets is 34.3% different for vehicle and equipment, and at the end of the usage lifetime, the possibility of selling property, landscaping, vehicle, machinery, and industrial equipment is 66-69%.

Case study results

Situation

Case study object Company A was established in 1994, and the questionnaire data is as follows.

- Activities of enterprises and organizations: Production
- Form of legal entity: LLC
- The total period of activity of enterprises and organizations: more than 25 years
- Number of employees / approx.: 100

[Table 3] Depreciation case study

Asset class	Specifications	According to IFRS	According to the CIT Act
Property and landscaping	Usage lifetime		+
	Depreciation method		+
	Residual value	+	
Vehicles, mechanisms, industrial equipment	Usage lifetime		+
	Depreciation method		+
	Residual value	+	
Computers, peripherals, and software	Usage lifetime		+
	Depreciation method		+
	Residual value		+
Intangible assets	Usage lifetime		+
	Depreciation method		+
	Residual value		+
Other types of assets	Usage lifetime		+
	Depreciation method		+
	Residual value		+

- If determined under the CIT Act, please state the reason. /You can choose more than one version/

- Depending on the fact that the above indicators cannot be determined according to IFRS because the accounting of the non-current assets is not mature enough
- 30-40% of the book value of non-current assets in total assets
- Percentage of depreciation expenses in sales revenue /as of 2021-2022/ 1-2%
- There are non-current assets that have been depreciated but are still in use.
- The period of use specified in the tax law differs from the period defined by the organization.
- The economic returns from non-current assets are not the same every year.
- At the end of the usage lifetime, it is considered possible to sell assets other than equipment.

The structure of non-current assets of Company A is as follows.

[Table 4] The structure of non-current assets of the Company

No	Assets	Initial cost The year 2022	Account value The year 2022	Percentage of assets that have been depreciated but are in use / At an original cost in 2022/
1	Property and landscaping	12%	5%	0%
2	Equipment	83%	87%	15%
3	Vehicle	1%	1%	0%
4	Furniture	3%	5%	1%
5	Computer Accessories	1%	1%	36%
6	Intangible asset-Program Supply	1%	1%	0%
Percentage of total assets			41%	5.3%

[Table 5] Depreciation expense as per percentage of net profit

No	Assets	Total Depreciation Cost /2020-2022 average/	Percentage of depreciation expense to net profit /2020-2022 average/
1	Property and Landscaping	8.7%	10.4%
2	Equipment	82.2%	98.9%
3	Vehicle	0.3%	0.4%
4	Furniture	3.1%	3.7%
5	Computer Accessories	4.3%	5.1%
6	Intangible asset-Program Supply	1.4%	1.7%
Total depreciation expense as a percentage of net profit			120.3%

Conclusion

- All non-current assets are depreciated and reflected in the Financial Statements 6 the requirements of the CIT Act.
- Although it was answered in the survey that the residual value of some assets is determined according to IFRS, the analysis of detailed records of non-current assets determined the residual value of all assets as "0".
- Assets that have been depreciated but are still receiving economic returns account for 39% of the total (70 assets). It accounts for 5.3% of the total assets at initial cost, and the equipment purchased relatively early (2000-2005) constitutes the majority.

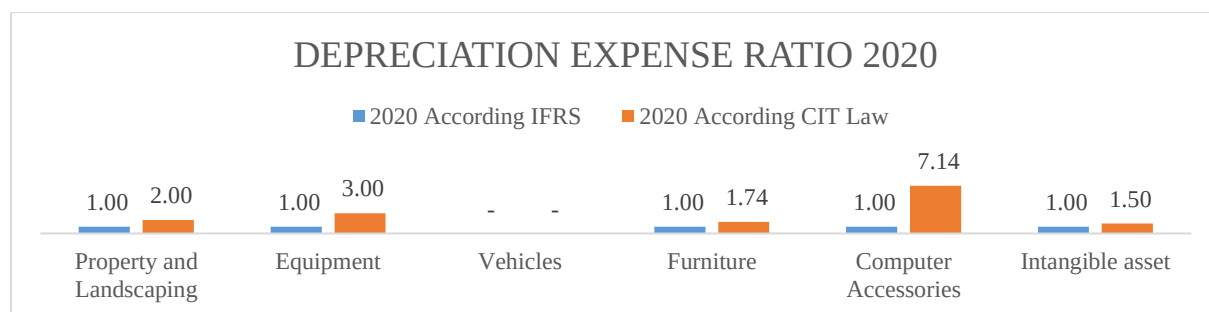
Analysis – Changes in non-current asset depreciation and amortization policies and related recalculations

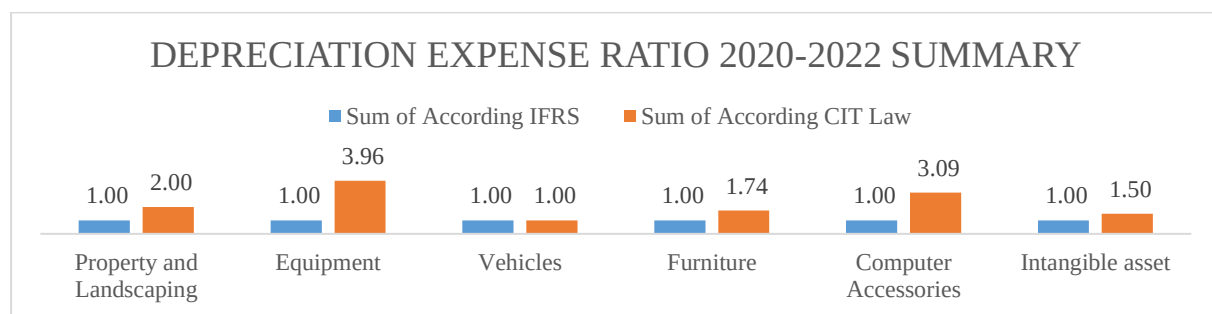
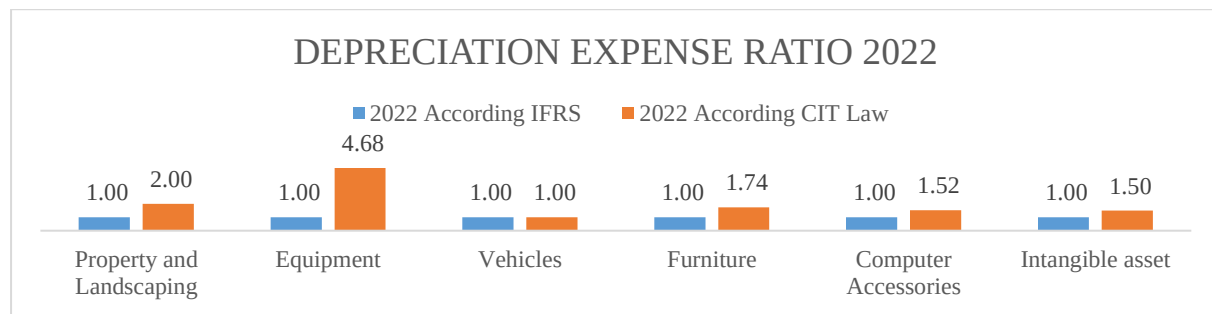
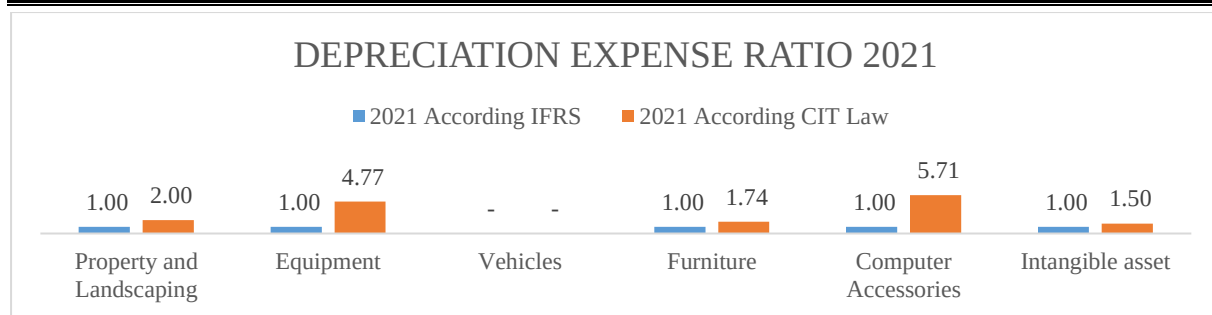
After analyzing a total of 180 non-current assets included in the detailed account of non-current assets of Company A, interviewing officials such as the company's chief accountant, factory accountant, factory director, technologist, and warehouse treasurer, as well as a detailed analysis of the detailed account of non-current assets, it was found that the non-current assets The usage lifetime, the method of calculating wear and tear, and the residual cost have been redefined. It includes:

[Table 6] Changes in the assets

Indicator	The number of assets that have changed	Number of unmodified assets	Reasons for change	Changes made
Depreciation method	87 /48%	93 /52%	The return on the asset is not aligned with the economic returns from some assets.	Computers, Peripherals, and Vehicles – Accelerated Method Production Equipment – Methods of Operation
Residual value	77 /43%	103 /57%	Some assets were considered to be salable at the end of their usage lifetime at a valuation of around 5-15% of their original cost.	Assets with an initial cost of less than 500,000¥ – 5% Capital with an initial cost of 500,000¥-10,000,000¥ – 10% Assets with initial cost over 10,000,000¥ – 15% It was considered that the production equipment has no separate cost because it is inseparable from the property.
Usage lifetime	179 /99%	1/1%	70 units or 39% of the total number of non-current assets have been worn out but are still in use. 109 units, or 59% have to be a longer usage lifetime.	The total tenure is extended by 50-150% for each detailed asset class. The lifetime of the intangible asset /Operation license/ has been retained as the legal term.

As a result of the above changes reflecting the suggestions of the relevant officials of the organization, the depreciation and amortization costs of non-current assets were recalculated and compared with the amount shown in the financial statements of Company A as follows.





In other words, according to the data of 2020-2022 or the past 3 years, company A reported the amount of depreciation and amortization of non-current assets in its financial statements by the CIT law, which is 1.5-3.9 times higher than the appropriate amount if it is reflected by IFRS (Vehicles except). Here's a look at the numbers against some financial metrics:

[Table 7] Percentage of depreciation expense to net profit

	2020	2021	2022	Average
Depreciation expenses reported by company A /According to the VAT law/	142.6%	112%	111%	120.3%
The amount that would be appropriate to report under Company A's IFRS	50.1%	28.3%	31.4%	35.5%
Different	92.5%	84.2%	79.6%	84.8%

[Table 8] Impact on Total Assets (cumulative)

	2020	2021	2022
The percentage of the total assets of the book value of the EBH reported by company A /According to the VAT law/	33.2%	40.7%	34.0%
Company A's share of the book value of the company's assets as determined by IFRS	37.4%	48.5%	44.5%
Different	4.2%	7.8%	10.5%

In the past 3 years alone, Company A has:

- Net profit was understated by 79.6-92.5 percent. In other words, the net profit to be reported by IFRS is 1.8-1.9 times higher than the reported net profit.
- Total assets are understated by 10.5 percent based on a 3-year cumulative amount.

Conclusion and Discussion

As a result of this research, the following conclusions and recommendations are submitted. It includes:

- More than 60 percent of the surveyed organizations do not comply with the requirements of IFRS when depreciating and amortizing non-current assets and define their policy by the CIT Law. Assuming that the sample can represent the original population, it is likely that the implementation of IFRS of non-current assets by enterprises and organizations of MU is insufficient.
- As declared in the Accounting Law and the Concept of IFRS, Financial Statements are general purpose and require the preparation of sufficient and appropriate information for the decision-making of information users. However, when companies and organizations determine the depreciation and amortization policy of non-current assets included in the financial statements, they are determined by the requirements of the CIT Law, which is a guideline for the preparation of reports for special purposes, and not IFRS, which creates the risk of not being able to meet the main purpose of preparing the financial statements. In other words, it creates conditions to doubt the reliability of the quality of financial reporting information.
- An example of company A selected as a case study object: The amount of net profit reported by the organization for the last 3 years and the amount reflected in the financial position statement are significantly different from the amount determined according to IFRS, which means that the quality of the information in the financial statements of the organization does not reach a sufficient level. leading to do.
- Finally, to conclude, enterprises define their accounting policies for preparing general-purpose financial reports by the requirements of CIT reports, which are special-purpose reports, which creates a risk that the quality of the information in financial reports does not meet the requirements of IFRS

References

IFRAC. (2022). *IFRS*. London: IFRAC.

Г.Гантулга. (2018). *Санхүүгийн тайлангийн мэдээллийн чанарыг үнэлэх нь*. Улаанбаатар: СЭЗИС.

Монгол улсын их хурал. (2015). *Нягтлан бодох бүртгэлийн тухай хууль*. Улаанбаатар: Монгол улсын их хурал.

Монгол улсын их хурал. (2020). *Аж ахуйн нэгжийн орлогын албан татварын тухай хууль*. Улаанбаатар: Монгол улсын их хурал.

Нягтлан бодох бүртгэлийн хөгжүүлэх сан. (2015). *СТОУС-ын хэрэгжилт*. Улаанбаатар: Нягтлан бодох бүртгэлийн хөгжүүлэх сан.

ITES-32

Comparative Analysis of Probability Theory and Mathematical Statistics course for engineering students

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Abstract: The role of discipline in the training of specialists in computer engineering, computer systems, and networks is determined by the fact that methods of probability theory and mathematical statistics are important tools for developing computer hardware and software, an important factor in their effectiveness for a wide range of practical applications. Probability Theory and Mathematical Statistics is a theoretical course with approximately 100 students. There are around 60 second-year students, from the Bachelor Specialist of the School of Technology in Darkhan-Uul, MUST program, who study this course at the Department of Fundamental Science. This article is aimed at a quantitative analysis of the effectiveness of some educational technologies in teaching the discipline "Probability Theory and Mathematical Statistics" at the School of Technology in Darkhan-Uul, MUST.

Keywords: course content, university program, course setting

1. Introduction

Statistically studied the influence of the application of some interactive pedagogical technologies (programmed learning, mathematical games, business games) and the results of assimilation of students in the theory of probability and mathematical statistics. As part of the pedagogical experiment, a comparison of the control group with the experimental groups, in which the named learning technologies were applied, was carried out. A noticeable increase in the quality of knowledge, connected with the application of innovative teaching methods and revealed within the framework of the application of the modular rating system, finds its confirmation in the results of intermediate testing and evaluation of final examinations. The content of this article is a quantitative analysis of the effectiveness of some educational technologies in teaching the discipline "Probability Theory and Mathematical Statistics" at the technical university. As part of the pedagogical experiment, a comparison of the control group with the experimental groups was conducted, in which one or another teaching method was applied. It is necessary to emphasize that technologies from the above list were used both in the control and the experimental groups. When comparing the results of the training, achieved with the application of various methods, used elements of the modular-rating system of training. The Probability Theory and Mathematical Statistics" course is a compulsory course for students of computer engineering and over 60 students are taking this course in the Spring semester of the 2022-2023 academic year.

2. Survey Research

2.1 What is the effectiveness of educational methods

There is currently a shortage of high-qualified engineering staff capable of solving tasks on a completely new technical level, fully owning the fundamental knowledge, design skills, possessing leadership qualities, and teamwork skills. The task of overcoming it seems to be very relevant. Challenges and the reality of recent times require the training of technical specialists of a new level that are able to integrate, process collect information from various sources and stei and on a basis to take effective decisions and solutions. Work with subject matter experts to define each step required to solve that problem so you can identify the skills/knowledge that are needed in the course. When comparing the learning outcomes achieved with the use of various methods, elements of the modular-rating system of education were used. For the effectiveness of pedagogical technologies, careful study is necessary. The problem of pedagogical technologies as a component of the pedagogical system has been and is being dealt with by many teachers and psychologists. V.P. Bespalko and M.V. Klarin study the definition of pedagogical technologies, and B.P. Likhachev focuses in his works on the tasks of pedagogical technology. G.I. Shchukina and M.N. Skatkin have an activity-based approach to learning. But the aspect of the practical implementation of modern pedagogical technologies in the classroom remains relevant. Concerns have been repeatedly expressed that the rigid organizational and administrative framework during the implementation of the module-rating system of education will turn it into weights for the teacher. Preliminary analysis of theoretical research knowledge and experience of lecturers from other universities calls, as well as their own practical experience only systematic and targeted apps changes in the educational module assessment system allows you to achieve the required quality in mathematics educate students and significantly increase its effective setting for the training of professionals knowledge, skills and abilities of engineering students university. [3]

2.2 Problems of Probability Theory Course Teaching

In today's world, the realm of information has undergone significant advancements, and stochastic mathematics' fundamental principles and approaches have emerged as crucial standards for evaluating modern professionals' knowledge in information gathering, processing, and application. Nonetheless, the present education system is plagued with certain issues. It lays excessive emphasis on professional education, which could result in a limited comprehension of the role of mathematical education in universities. This, in turn, could have a substantial impact on the educational sector as a whole. Presently, a vast array of teaching staff still shares this viewpoint as they have not explored the significance of university mathematics in higher education. For educators, the course material can be monotonous, and the teaching program and syllabus are rigid, leading them to focus solely on textbooks and examinations. This, in turn, could impede the development of students' abilities and quality, thereby hindering their enthusiasm and growth. Additionally, the teaching methods concentrate on symbolic matching and problem-solving skills training, disregarding guidance from direct and background perspectives. [4]

3. Methods

3.1 Procedure

Our research purpose is to compare the first content of the course at the Mongolian University of Science and Technology and “Probability Calculus” and “Statistics” by Buryat State University (BSU) in Russia and the second a quantitative analysis of the effectiveness of some educational technologies in teaching the discipline at the School of Technology in Darkhan-Uul, MUST. Probability and Mathematical Statistics is a course that requires approximately 200 students. About 60 sophomores are taking courses in the Bachelor of Software Engineering program at MUST Technical Institute in Darkhan-Uul. (STDA) This course has been compared with the "Probability Theory and Mathematical Statistics" course at Mongolia Technical University and the "Probability Calculation" and "Statistics" course at Buryat State University (BSU) in Russia.

4. Results, Data Analysis

Probability theory and statistics courses given at these universities are shown in Table 1.

[Table 1] Outlines of Probability Theory and Mathematical Statistics at STDA and BSU

Course details	STDA	BSU
Undergraduate/ graduate degree	Undergraduate	Undergraduate
Chosen time	2	3
Compulsory/elective	Compulsory	Compulsory
Number of credits	3	4
Teaching hours	64	96
Graduate Hours	32	64
Instructors	None	1
Computer labs	None	Presented
Course Average Number of Students	45	80
Average Passing Percentage	81%	85%
Percentage of International Students	None	None

In Table 1, both compulsory courses and mathematical analysis are faulty courses in these universities. Grades are the difference between these colleges. At BSU, the second year of Bachelor's degree programs - The Need for Quality (third semester) and Mathematical Statistics (fourth semester). Prerequisite courses are Analysis (one semester and two semesters), algebra and Geometry (two and three semesters), discrete mathematics (two and three semesters), and mathematical logic and algorithm theory (three semesters). At STDA, the two-year courses - Science and Mathematics (fourth semester) are inseparable. BSU has computer labs while STDA does not have computer labs for requirements and math courses. For BSU, the course size according to the Computer Engineering curriculum is 6 credits, which means that students average 96 hours of study (36 hours per credit). Credits are allocated to different activities, including 36 hours of lectures, 22 hours of computer labs, 64 hours of homework, and 36 hours of exam preparation. According to the STDA Software Engineering curriculum, the course size is 3 credits, which means an average of 108 hours of student work, 36 hours of lectures, and 36 hours of discussion. While BSU students have to complete four laboratory sessions by taking four exams in two semesters, our students have to pass

two exams and complete five sessions, which are discussed separately in a period when there is no discussion room. Final grades are determined by the examiners at the end of the semester in both universities. We also compared the content of probability theory and mathematics courses in the two universities. The results are shown in Table 2.

[Table 2] Outcome competencies of Probability Theory and Statistics courses at STDA and BSU

Capability	STDA	BSU
Calculate the mode, median, and mean of a set of data items	✓	✓
Define the terms "out", "event" and "probability"	✓	✓
Calculate the probability of an event by counting	✓	✓
Calculate the probability of success of the event	✓	✓
Calculate the probability of a combination of two events	X	✓
Calculate the probability of a combination of two events	✓	✓
calculate the probability at the intersection of the event	X	✓

A comparison shows that the two courses mostly cover the same concepts and skills. Course placement is different from a degree course. While probability theory and statistics courses are given in the third and fourth semesters of BSU, in STDA this course is given in the fourth semester depending on the study plan. The difference was observed in each period. Second, we analyzed the effectiveness of the learning outcomes of students in the control and experimental groups. The results were shown in Table 3.

[Table 3] The effectiveness of the learning outcomes of students

Characteristics of the Effectiveness of Learning Outcomes for Students	Maximum meaning characteristics	Control group /28 students/	Experimental group /22 students /
Average score			
for activity at seminars on TV	7	3.6	3.7
for the test work on the topic "Random events"	5	3.11	3.24
for the verification work on the topic "Random Variables"	5	2.98	3.01
for laboratory work on TV	9	4.51	5.01
for work on TV (without testing)	28	13.50	15.6
Percentage of students admitted to testing on TV	100	45.6	68.20
Average test score on TV	23	12.8	17.6
Average rating of the 1st module (TV)	52	21.3	26.51
Average score			
For the verification work on the topic of "Random processes"	4	2.63	2.48
for laboratory work on SP	3	2.51	3.51
for settlement and graphic work (SP)	5	4.11	4.3
Average rating of the 2nd module (SP)	13	8.92	9.20
Average score			
for activity at seminars on MS	5	3.11	3.48
for laboratory work on MS	5	3.12	3.26
for settlement and graphic work (MS) or for a business game	5	3.62	3.40
MS testing	11	7.21	8.56
Average rating of the 3rd module (MS)	28	17.68	17.98
Average overall rating	100	41.20	54.87

Percentage of students who received a grade without an exam	100	39.56	52.30

Table. 2 shows that the proportion of students regimental group admitted to testing according to the theory of probability, is noticeably higher than the analogous logical indicator of the control group. The test results are also higher among the students of the experimental group. Therefore, we can conclude that the use of mathematical battles and the training program leads to a noticeable improvement in students' understanding of the basics of probability theory.

5. Conclusion

We only do a content analysis of STDA and BSU courses as compulsory courses, but the teaching reform of courses still needs continuous study and improvement training. A comparison below shows the similarities and differences. The most striking similarity is that all three meanings of refer to the same four categories: Identification number; Simple arithmetic operations; Number sense and quantity relations; and Recognition of Different Agents, respectively. Qualitative assessment of **students'** knowledge can be carried out according to such indicators as the depth of knowledge; the effectiveness of knowledge; consistency; awareness of knowledge. Quantitative indicators: the amount of acquired knowledge; the speed of assimilation of educational material; assimilation strength; accuracy of assimilation, etc. Evaluate the learning outcomes, taking into account the totality of the above indicators, possibly using the test control methodology or the method of component analysis. Of these, learning is combined with learning the same things and activities using the same measurement tools, and the use is the same. Some students can study very quickly, i.e. study some or all of the points first, but don't do points or test work first. Why wait for 's other friends? In fact, many factors such as affect it, students are insecure and are not competitive. In general, the modular grading system creates the conditions for the effective use of individual and individual mathematics teaching, gives flexibility and importance to the educational process, and finally allows us to talk about the possibility of improving the quality of mathematics teaching.

References

- [1] 1. Бутакова Е.С., Замятина О.М., Мозгалева П.И. К вопросу о подготовке элитных инженерных кадров: опыт России и мира // Высшее образование сегодня. 2013. No 1. С. 20–25.
- [2] Huang baoxing. "Application of Matlab in the teaching of probability theory and mathematical statistics". Science and Technology Information . 2008.
- [3] Qi, Hongsheng, and Xichao Sun. 2018. *Under the background of the new engineering applied probability and statistics in colleges and universities teaching exploration*. Science Tribune (late) (18): 118–119.
- [4] Wenyao Xiong 2016. *Research on the Probability Theory and Mathematical Statistics Teaching*: 6th International Conference on Electronic, Mechanical, Information and Management (EMIM 2016)
- [5] Palumbo P, Ditlevsen S, Bertuzzi A, et al. *Mathematical modeling of the glucose–insulin system: A review* [J]. Mathematical Biosciences, 2013, 244(2):69-81.
- [6] SEFI (2013), "A Framework for Mathematics Curricula in Engineering Education". (Eds.) Alpers, B., (Assoc. Eds) Demlova M., Fant C-H., Gustafsson T., Lawson D., Mustoe L., OlssonLehtonen B., Robinson C.,

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A Result of some chemical and biochemical parameters of yak meat

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Abstract-Yak meat is rich in myoglobin, which easily oxidizes with oxygen in the air, giving the meat a brownish-red color. Yak fat has a bright yellow color due to the high amount of carotene that produces vitamin A. In our study, we determined the general chemical parameters and fatty acid composition by preparing meat samples from yaks bred in Duut sum of Hovd province and Bulgan sum of Arkhangai province. According to the results of the research, which the contents of moisture of yak meat was 68.06%, fat was 4.94%, protein was 22.5%, calories were 147.5 kcal, and ash was 1.15%. In determining the composition of fatty acids, the unsaturated fatty acids of the Duut yak meat in the high mountain region were 60.69%, and the saturated fatty acids were 38.8%, also the unsaturated fatty acids of the Bulgan yak meat in the forest region were 48.89%, and the saturated fatty acids were 50.99%. Also, among the saturated fatty acids in yak meat, palmitic acid 19.88%-23.89%, stearic acid 11.83%-14.17%, and oleic acid 35.4%-40.67% were the most abundant among unsaturated fatty acids. The samples yielded similar results in general chemistry, but differed in fatty acid composition. It is believed that it depends on the characteristics of the locality and natural area where the samples were prepared.

Keywords - saturated and unsaturated fatty acid, calories, protein, yak meat

1. Introduction

Yak have been bred in the mountainous areas of the Himalayas, Tenger mountain, Altai Khangai and Khuvsgol since ancient times. The yak is distributed in 13 provinces and 132 soums in the mountainous and forest regions of our country. More than 50% of yaks are located above 2000 meters above sea level, and about 40% are located at an altitude of 1600-2000 meters. They use water in local pastures that are not suitable for grazing other types of animals, and they produce products under normal conditions of maintenance, so they are economically efficient animals.

Yak meat is rich in myoglobin, which easily oxidizes with oxygen in the air, giving the meat a brownish-red color. Yak fat has a bright yellow color due to the high amount of carotene that produces vitamin A. Also, the meat is relatively coarser, darker, and has less fat, but all this does not reduce the quality, but shows that it has an appropriate fat-protein ratio and is rich in proteins and vitamins. Yak meat is similar to beef in terms of food demand and value in foreign markets.

One of the important components of food is fat, which accounts for 30-40% of energy requirements. Fat is not synthesized in human body tissues, so it needs to be obtained from food. It also plays an important role in forming the physical and chemical properties of food. Fats are a group of water-insoluble organic compounds that can be extracted from tissues with non-polar solvents such as chloroform, ether, and benzol.

It also plays two main roles: on the one hand, it becomes a component of the membrane structure, and on the other hand, it becomes a form of stored energy in metabolism [1]. Being a component of the cell membrane, fat plays an important role in membrane substance penetration, nerve tissue transmission, and cell-to-cell interaction[1].

Fatty acids are aliphatic - carboxylic acids, which exist freely in the body and connect with together to consist lipids. From the point of view of nutrients, polyunsaturated fatty acids, or fatty acids containing two or more secondary bonds, such as linoleic, linolenic, and arachidonic acids, are highly biologically active. These irreplaceable essential fatty acids are the structure of the body's cell membranes as well as the source of prostaglandins, a hormone-like substance [2].

Research has shown that fatty acids are involved in the formation of the taste and smell of meat, volatile and aromatic substances are released from the oxidation of lipids during heat treatment and interact with the products of the Mayard reaction to form volatile compounds of aroma and taste, phospholipid unsaturated acids are important in the formation of aroma, fatty tissue is the source of the unique smell of meat [5].

Oleic acid is the main monounsaturated fatty acid found in olive fatty acids. Oleic acid prevents atherosclerosis, increases insulin release, reduces glucose release from the body, improves the immune system, and protects against some types of cancer [6].

2. Survey research

Research materials and methods

Material: In our research, we determined the general chemical parameters and fatty acid composition by preparing samples of yak meat bred in Duut sum of Hovd province in the highland region and Bulgan sum of Arkhangai province in the forest steppe region according to the standards. Meat moisture was determined by MNS 6477:2014, fatness by MNS 5035:2020, protein by MNS ISO 937:1984, ash by MNS ISO 936:2003, and calories by SAZ 08:2009.

Methodology for determining fatty acid composition according to SAZ 18:2016: Gas chromatographic method for determination of fatty acid composition according to SAZ 18:2016, samples were prepared according to SAZ 18:2016, and 37 essential fatty acids mainly found in food was determined by HP-FFAP column (30m, I.D-0.32mm F.D., 0.25mm) gas chromatographic instrument with FID detector of Shimadzu factory "FAME 37 (C4-C24) mixture" standard solution was used to determine the composition of fatty acids.

3. Results of the research

3.1. Results of determined general chemical parameters:

The general chemical parameters of the samples prepared from the two provinces were similar, on average, the content of moisture of yak meat was 68.06%, fat was 4.94%, protein was 22.5%, calories were 147.5 kcal, and ash was 1.15%.

[Table 1] General chemical parameters of yak meat

№	Chemical parameters	Yak meat of Duut soum of Khovd province	Yak meat of Bulgan soum of Arkhangai province	Average
1	Moisture , %	71.02±1.16	65.1±0.08	68.06
2	Fat, %	4.57±0.87	5.32±0.03	4.94
3	Protein, %	22.16±1.84	22.85±1.02	22.5

4	Calories, kcal	129.8±0.4	164.3±0.09	147.5
5	Ash, %	1.32±0.04	0.98±0.06	1.15

Chemical parameters of meat vary depending on many factors such as location, age, gender, and fatness. As for the 2 sums selected and prepared by us, Duut soum of Hovd province belongs to the high mountain area, and Bulgan soum of Arkhangai province belongs to the forest area. In terms of age, Duut's yak was young, 4-5 years old, and Bulgan's yak was 7-8 years old. According to the results of the research, the fat content of the yak meat sample taken from Bulgan soum is slightly higher, which is consistent with the pattern of increase in meat yield and fat content as the animal matures.

3.2. Results of determined fatty acid composition

A total of 27 types of fatty acids were identified in yak meat, and the fatty acids accounted for 99.49% and 99.88% of the total fat in the meat of Duut soum yak and Bulgan soum. Determination of fatty acid content in yak meat revealed 12 saturated fatty acids (Table 2). Caprylic, undecane, tridecane and behenic acids were not detected in all samples.

[Table 2] Content of saturated fatty acids in yak meat, %

Formula	Fatty acid	Yak meat of Duut soum of Khovd province	Yak meat of Bulgan soum of Arkhangai province	Average
C ₄ :0	Masl	2.09±0.63	4.66±0.08	3.37
C ₆ :0	Capron	-	0.07±0.1	0.07
C ₈ :0	Caprile	-	-	-
C ₁₀ :0	Caprin	0.09±0.06	0.18±0.05	0.13
C ₁₁ :0	Andecan	-	-	-
C ₁₂ :0	Laurin	0.06±0.04	0.1±0.07	0.08
C ₁₃ :0	Tridecan	-	-	-
C ₁₄ :0	Myristin	1.15±0.02	2.76±0.09	1.95
C ₁₅ :0	Pentadecane	0.45±0.16	0.38±0.12	0.41
C ₁₆ :0	Palmitin	19.88±0.06	23.89±0.62	21.88
C ₁₇ :0	Heptadecane	0.87±0.1	0.79±0.07	0.83
C ₁₈ :0	Sterol	11.83±0.14	14.17±0.08	13
C ₂₀ :0	Arachidin	0.13±0.01	0.08±0.04	0.1
C ₂₁ :0	Geneikozon	0.12±0.03	-	0.12
C ₂₂ :0	Begin	-	-	-
C ₂₄ :0	Lignocerin	2.17±0.37	0.27±0.07	1.22
	Total	38.84±3.62	47.35±2.39	43.09

Six types of monounsaturated fatty acids were detected in yak meat. Among them, oleic acid was the highest (40.67%) and myristoleic acid was the lowest (0.15%) (Table 3).

[Table 3] Content of monounsaturated fatty acids in yak meat, %

Formula	Fatty acid	Yak meat of Duut soum of Khovd province	Yak meat of Bulgan soum of Arkhangai province	Average
C ₁₀ :1	Caprolein	-	-	-
C ₁₂ :1	Laureline	-	-	-
C ₁₄ :1	Myristolein	0.15±0.12	0.25±0.38	0.2
C ₁₅ :1	Cis-10-pentadecane	1.79±0.02	0.16±0.08	0.97
C ₁₆ :1	Palmitolein	4.55±0.09	3.84±0.24	4.19
C ₁₇ :1	Cis-10-heptadecane	1.69±0.78	-	1.69
C ₁₈ :1	Olein	35.4±0.05	40.67±0.23	38.03
C ₂₀ :1	Cis-11-eicosane	-	-	-
C ₂₂ :1	Yerukin	0.43±0.07	1.2±0.16	0.81
C ₂₄ :1	Nervonite	-	-	-
Total		44.01±1.13	46.12±1.09	45.06

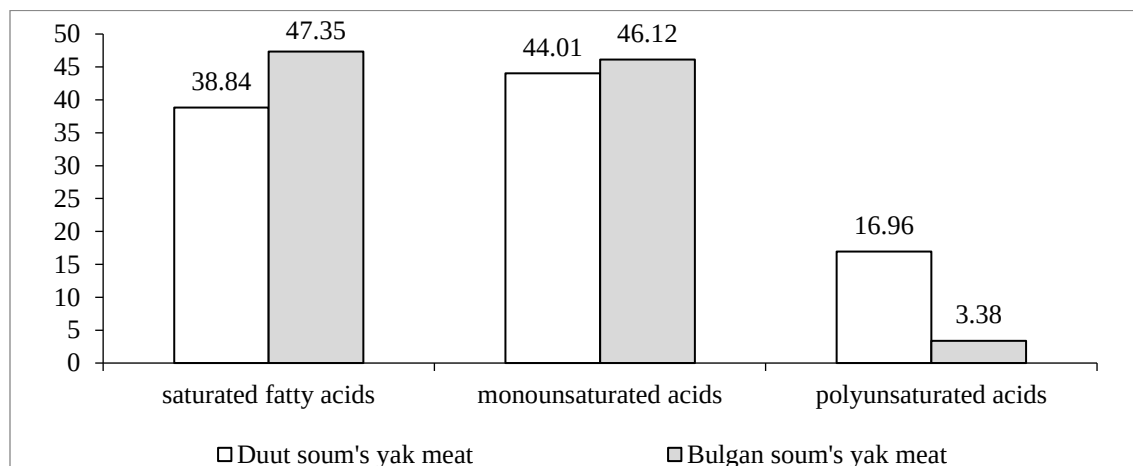
9 polyunsaturated fatty acids were found in yak meat, and highest percent is linoleic acid accounted for 7.14%. Linoleic and adrenic acids were not found in yak meat (Table 4).

[Table 4] Content of polyunsaturated acids in yak meat, in %

Formula	Fatty acid	Yak meat of Duut soum of Khovd province	Yak meat of Bulgan soum of Arkhangai province	Average
C ₁₈ :2c	Linol	7.14±0.25	1.17±0.31	4.15
C ₁₈ :2t	Linoleum	-	-	-
C ₁₈ :3 n-6	Gamma linolenic acid	0.17±0.09	0.13±0.07	0.15
C ₁₈ :3 n-3	Alpha linolenic acid	1.67±0.02	0.72±0.04	1.19
C ₂₀ :3 n-6	of cis 8, 11, and 14 eicosatriene	0.42±0.08	0.11±0.03	0.26
C ₂₀ :3 n-3	of cis 11, 14, and 17 eicosatriene	-	0.46±0.01	0.46
C ₂₀ :4 n-6	Arachidonic acid	5.28±0.36	-	5.28
C ₂₀ :5 n-3	Cis 5,8,11,14,17 eicosapentaene	1.71±0.25	0.23±0.05	0.97
C ₂₀ :2	Gadolium	0.28±0.04	-	0.28
C ₂₂ :2	Adrenic acid	-	-	-
C ₂₂ :6 n-3	DHA	0.29±0.05	0.56±0.06	0.42
Total		16.96±1.14	3.38±0.57	10.17

According to the results of the composition of fatty acids, the sum of unsaturated fatty acids in Duut's yak meat is 60.69%, and the sum of saturated fatty acids is 38.8%; The total unsaturated fatty acid content of Bulgan's yak meat was 48.89% and the total saturated fatty acid content was 50.99%, respectively. Also,

yak meat contained the highest palmitic acid 19.88%-23.89%, stearic acid 11.83%-14.17%, and oleic acid 35.4%-40.67% of unsaturated fatty acids respectively (Figure 1).



[Figure 1] Total fatty acid content of yak meat comparative figures, %

The total content of polyunsaturated acids in Duut soum yak meat was higher or 13.5%. It is believed that this is due to the high amount of polyunsaturated fatty acids contained in the oils of animals and animals of the high mountain region. The unsaturated fatty acid content of the yak meat from the high mountain region was higher than that of the yak meat bred in the forest region, which confirms the regularity of the increase in the composition of unsaturated fatty acids as the total fat and fatty acid composition of animals and animals rises above sea level.

3. Discussion

In this study, the fatty acid composition of yak meat in two different regions of Mongolia was compared. According to the results, the fat content of yak meat was determined to be slightly higher or 0.6% higher depending on the age. According to J.D. Wood [11] research results, the composition of total fatty acids in animal muscle tissue is similar, and palmitic (C16:0), stearic (C18:0), and oleic acids (C18:1) are dominant, and the amount of these acids depends on the type of animal and tissue, varies in size, and the content of polyunsaturated acids, including linoleic and linolenic acids, is high and relatively abundant in beef.

According to the our results of fatty acid composition, a total of 27 fatty acid components were determined in yak meat, and the above fatty acids accounted for 99.49% and 99.88% of the total fat in Duut soum yak and Bulgan soum meat. Of these, the saturated fatty acid in Duut and Bulgan soum yak meat is 38.84% and 47.35%, monounsaturated fatty acids 44.01% and 46.12%, polyunsaturated fatty acids contained 16.96% and 3.38%, respectively. According to researchers, the amount of C16:0 acid in beef muscle tissue is 26.1%, which is 4-5% more than Mongolian yak meat. However, the content of C18:0 acid was found to be almost the same. 3% polyunsaturated fatty acids were detected in C18:1 yak meat, which indicates the characteristics of Mongolian grassland yak meat [11].

5. Conclusion

1. The average chemical parameters of yak meat were moisture 68.06%, fat 4.94%, protein 22.5%, calories 147.5 kcal, ash 1.15%.
2. In determining the composition of fatty acids, a total of 27 types of fatty acids were found in yak meat, 12 saturated fatty acids, 6 monounsaturated fatty acids, and 9 types of polyunsaturated fatty acids were found.
3. The sum of unsaturated fatty acids of Duut soum yak meat was 60.69%, the sum of saturated fatty acids was 38.8%, the sum of unsaturated fatty acids of Bulgan soum yak meat was 48.89%, and the sum of saturated fatty acids was 50.99%, respectively.
4. In our country, a lot of research has been done on the chemical parameters of various types of animal meat, but there are few studies on the composition of fatty acids and amino acids of yak meat, so scientists and researchers should pay attention to the research in the above area.

Appreciation

The project "Establishment of Asian food composition database" implemented by the University of Agriculture is being implemented with the funding of the "Asian Food and Agriculture Cooperation Initiative" (AFACI) international organization.

Also, a commissioned work on the topic "Possibilities of introducing traditionally prepared yak meat and dairy products to the market", which is being implemented with the funding of the United Nations Development Program, is being implemented. This research was carried out within the framework of these projects.

I would like to thank the funding organization of the project (Asian Food and Agriculture Cooperation Initiative, UNIDO) and the project team and community.

References

- [1] Dumaa. Yo. (2013) Biological Chemistry, Ulaanbaatar
- [2] Enkhtuya.B. (2015) Fatty acid composition of Mongolian livestock. Ulaanbaatar
- [3] Tsevegsuren.N, Purev.D (2017) "Guidelines for Biochemistry Practice" Ulaanbaatar
- [4] Tsendsuren.S (2014) "Technology of processing raw materials and products of animal origin" Ulaanbaatar
- [5] Mongolian Journal of Agricultural Sciences, (2021) Vol 32 No 1, Ulaanbaatar
- [6] Tserenpuntsag. Sh, Burenjargal. S. (2013) "Veterinary Hospital Sanitation Feasibility Study" Ulaanbaatar
- [7] Gunter Heinz, Peter Hautzinger (2020) "Meat Processing Technology", Ulaanbaatar
- [8] Ongoodoi. Ch. (2013) "Food Science" Ulaanbaatar
- [9] Journal of agricultural sciences (2019) Vol.4, No.2, European Union
- [10] J.F. Price, B.S. Schweigert. (2016) The Science of Meat and Meat Products, Germany
- [11] J.D. Wood, M. Enser, A.V. Fisher, Fat deposition, fatty acid composition and meat quality, Meat science, (2018) 343–358

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Mongolian meat export: food safety

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Abstract: The global climate change, frequency of droughts, land degradation, lack of pastures, pasture bearing capacity, excessive increase in the number of animals, etc., cause the limitation of resources and the need to change and improve the methods of livestock production. In 2021, Mongolia counted 67.3 million head of livestock, produced 512.7 thousand tons of meat by slaughter weight and supplied 430 thousand tons of meat for domestic consumption and 8.6 thousand tons of meat for export. In other words, 98% of the year's total supply is for domestic consumption, and the remaining part is exported. The 9% of the world's meat production comes from pastoralism, 54% from combined agriculture and animal husbandry, more than 50% of pork and poultry, and 10% of beef and mutton are prepared from factories. As of 2021, the United States led the way in meat exports worth \$9.3 billion, Brazil \$8 billion, and Australia \$7.3 billion. The global meat market capacity was estimated at 897.5 billion US dollars in 2021 and will reach 1.3 trillion US dollars by 2026. According to the prediction of 2031, the number of livestock in Mongolia will exceed 100 million, and this will continue to have a negative impact on the environment due to overgrazing. Therefore, it is necessary to increase the export of meat by rationally solving the problem of animal health. Within the framework of public and private sector partnership, the issue of meat export will be intensified, increasing the number of enterprises that fully meet the requirements of the importing country to ensure and guarantee the safety of meat and meat products, supporting measures such as restoring and intensifying the export of meat and meat products at the policy level, animal diseases reduction and improvement of veterinary services are legitimately required. In the study, statistical data was processed with the aim of determining the future trends, possible risks and obstacles of meat export in Mongolia. In the future, it is necessary to increase the variety of meat products and to study more about the foreign trade requirements of importing countries.

Keywords: Livestock, products, trade, bearing, disease

1. Introduction

The total number of livestock in Mongolia has steadily increased in recent years, reaching 67.3 million by 2021. Although the increase in the number of animals is a good thing, the researchers found that the carrying capacity of pastures is too high, greenhouse gas emissions are high, there is insufficient fodder, and the spread of animals is high. Animal diseases create conditions for negative consequences and risks. Therefore, implementing a comprehensive meat export policy (sanitary, quarantine, laboratory, certification, supply chain, etc.) can be an important way to reduce these negative consequences and increase export earnings.

As of 2021, agricultural production accounts for 9.5 percent of Mongolia's gross domestic product and employs 25.5 percent of the total labor force [7], and although the share of the agricultural sector appears to be declining, there are enough resources to be used in this sector. The livestock sector has always been

important for the economic and social development of Mongolia, and the legal issue of raising livestock and increasing income, which is the basis of sustainable development of this sector, has become a pressing social issue. Mongolia meets its domestic meat needs, and since 2001, it has been exporting processed meat to Russia, China, South Korea, Indonesia, Iran, Japan, South Korea, and the Netherlands. Since 2016, it has been exported only to Russia and China, and the majority of it is 80-99% to China [4]. In 2019, beef accounted for 21.04 percent of the 545.02 thousand tons of meat produced by slaughter weight, and 7.9 percent of the total meat was exported. There are more than 220 registered slaughterhouses and meat processing enterprises in the country, including more than 30 enterprises licensed to export meat to China and 40 to Russia [4].

Domestic meat prices rise during outbreaks of highly contagious animal diseases, which creates fluctuations in meat prices. According to the data of the National Statistics Committee, the number of animals that died of diseases in our country varied from 54,000 to 81,000 in the last 5 years. If we look at it regionally, the number of animals dying from diseases in Khangai and Central regions is higher than in Western and Eastern regions [4]. Mongolia has potential resources for meat production, and it is necessary to pay special attention to this resource to the world market and to increase the country's trade. Exporting meat is a big problem in the current situation where more than 90% of all meat prepared in Mongolia is prepared by hand [1]. In addition to neighboring countries, Vietnam, New Zealand, Australia, as well as Persian Gulf countries are interested in buying meat from Mongolia. The Chinese want to take the meat of Mongolian animals cooked, and the Arab countries want to take it in a cut form, but we do not have such technology yet. The government needs to provide policy and financial support for the localization of the necessary technologies [2-3]. There are 7 laws, 8 resolutions, 5 protocols, 6 regulations, and 8 standards in the framework of legal documents in force in export [5].

Although government agencies have signed a memorandum of cooperation with neighboring countries to improve the legal framework for meat export and control, some regulations and standards need to be amended due to poor technical and technological development [6]. The purpose of the study is to identify the problems facing meat export, especially animal diseases that can affect food safety, and to develop recommendations to reduce them. The novelty of this research lies in increasing the export of Mongolian livestock meat and clarifying the quality issues affecting it. Because the main problem of meat export is meat preparation and its quality, and it is necessary to study how it meets the common criteria set by the importing country.

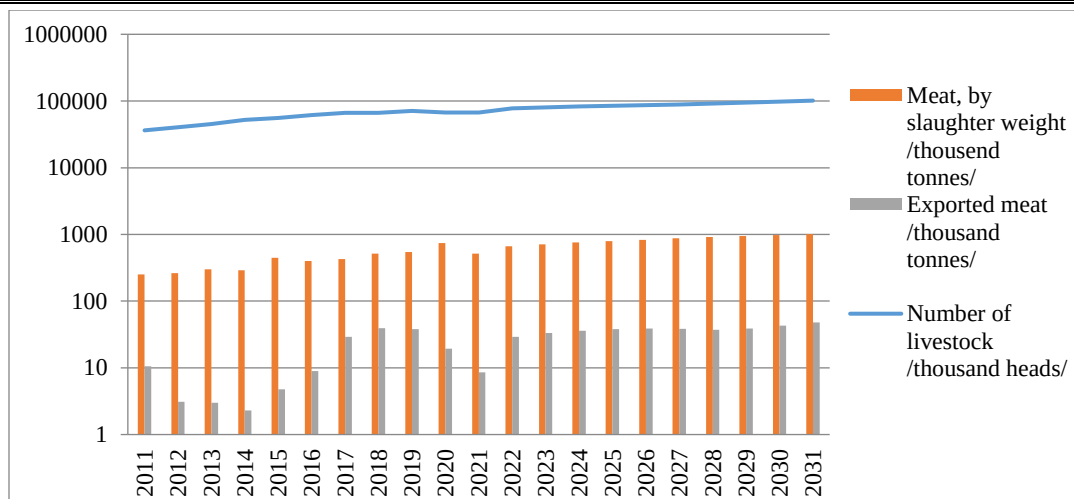
2. Survey research

2.1. Research materials and methods

In the research, the future results are predicted by using the data provided by the Statistical Committee of Mongolia. The main feature of this analysis depends on which model is used, and it selects functions with high correlation between factors. Also, a SWOT analysis of meat export was performed to determine the current situation.

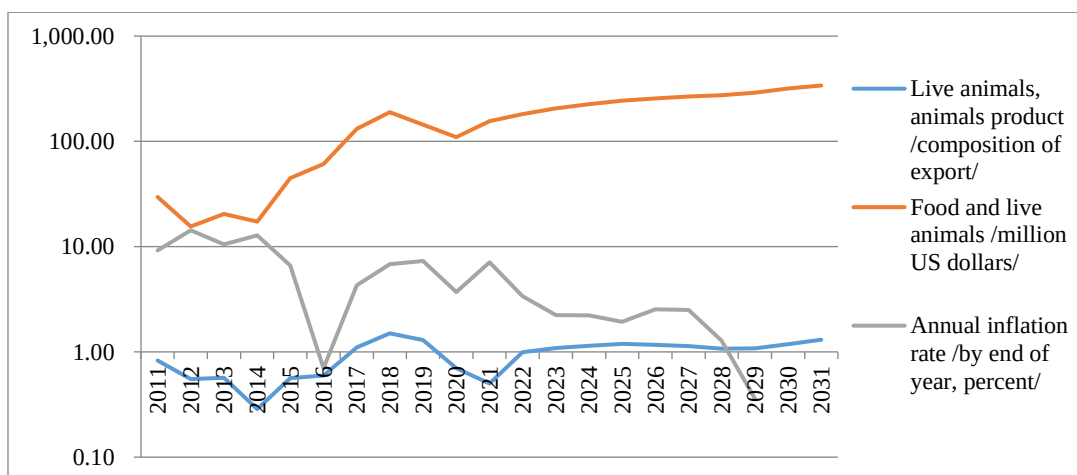
2.2. Results of the research

A forecast analysis up to 2031 was carried out using the general parameters related to the number of livestock and meat production from 2011 to 2021, and the results are as follows. In 2011, the number of livestock increased from 36.3 million to 67.3 million in 2021 [7]. According to this trend, it will reach 101.3 million heads in 2031. This shows that the carrying capacity of the pastures will reach a catastrophic level and there is an urgent need to make the animals healthy and export them.



[Figure 1] Trends in meat production and export

Since 2019, the amount of meat exports has been decreasing [7], and judging by the trend of previous years, it is expected that the amount of exported meat will not increase significantly. However, growth in meat production is also expected to be low. Due to the increase in the number of animals, the capacity of pastures is deteriorating, which shows that there is an urgent need to export meat. For this market, it is possible to fully satisfy domestic needs and export abroad. These estimates are probabilistic and may change in the future.



[Figure 2] Trends in key economic indicators

Between 2011 and 2021, the volume of exported food and live animals showed high growth, which is expected to increase in the future. This indicator is related to the growth of number of livestock, and shows that as livestock increases, exports can be increase. Live animals, animal product (composition of exports) are expected to grow slightly over the next decade, following constant export volumes. However, the inflation rate has not been studied in comparison with other factors, so it will tend to decrease in the future. In other words, the factors affecting inflation are not fully covered, and it is not directly related to the research work.

[Table 1] SWOT analysis of meat exports

Strengths /S/	Weaknesses /W/
S1. Mongolian meat has good taste and quality. S2. Mongolian meat is in high demand in foreign markets. S3. It is possible to export Mongolian livestock. S4. The variety of meat and meat products can be increased.	W1. Animal health does not meet international standards. W2. The animal's body is stretched W3. The certificate of origin of the meat is bad W4. Lack of laboratory capacity
Opportunities /O/	Threats /T/
O1. There are good resources for meat export. O2. The price of meat is lower than the world market. O3. The number of importing countries is increasing. O4. Research on the export of Mongolian meat to the world is intensifying.	T1. Lack of awareness of market demands and needs, lack of readiness for competition. T2. Domestically there are many meat processing plants, so there are many competitors. T3. The government's policy is unstable. T4. Inadequate technical regulation of meat

4 strengths, 4 weaknesses, 4 opportunities, and 4 threats are defined by SWOT analysis indicators of the meat market. SO strategy means the strategy of making full use of the opportunities of your strengths, ST strategy means the strategy of reducing the threats of your strengths, and WO strategy means the opportunities strategies to improve one's weaknesses, WT strategy means strategies to correct one's weaknesses and to avoid threats. So those strategies can be used for decision making.

Although the Law on Animal Health came into force in 2018, the implementation of the law is still weak. It is aimed at increasing meat exports, but the amount of meat exports is still not increasing significantly. Mongolia has full potential for meat export, but due to the following reasons, there are considerable obstacles in increasing the amount of exports.

For example, for public administration institutions:

- Lack of measures to control and reduce highly infectious diseases of domestic animals
- Weak supply and injection of animal medicine
- Inadequate product quality assurance and laboratory capacity
- Product transportation and logistics issues are weak
- There is no reward system & animal earnings for meat policy

For meat exporting enterprises:

- It is necessary to obtain the status of free from FMD and diseases that have been eradicated or not registered in Mongolia from the World Animal Health Organization,
- Animal slaughtering methods are not used in accordance with the religion of the citizens of the importing country
- In addition to the weak meat preparation system, integrated policy planning is insufficient,
- Slaughter methods are not based on modern technology,
- Inadequate transportation and storage issues,
- The infrastructure of the border ports is weak and insufficient in terms of rapid introduction of goods
- The government does not provide policy and financial support

For meat entrepreneurs:

- Problems with price changes
- Problems related to warehouse storage
- Challenges related to seasonal fluctuations
- Product quality issues
- Challenges related to unexpected shortages in meat supply
- Problems with transportation
- Difficulties related to production technology
- Challenges related to the sales channel
- Equipment problems

3. Discussion

In 2014, Z. Yadmaa studied the current state of the export of livestock products and the future state in his research work "Production and export trends of livestock products" [6].

In 2016, A. Bakei et al. studied the policy adopted by the government and the influencing factors in their report entitled "Government policy on meat production and export: problems and solutions" [2].

In 2017, D. Kadyrbek et al. conducted research on foreign market access opportunities and resources in their research work entitled "Foreign meat market: resources, demand, and prices" [3].

In 2021, B. Khishigdavaa, in his article entitled "Comparative study of legal documents for meat export", compared the documents required by exporting and importing countries, domestic laws and legal documents [5].

Conclusion

Animal husbandry sector is a traditional sector of the economy that occupies a large place in the total national and domestic products. Recent studies and assessments show that livestock production today is at a crossroads. Since there is no policy to regulate livestock growth in a proper way, maintain the population at a stable level, and there are no incentives in line with market principles, there is a biased tendency to only increase the number of livestock in order to protect against risks and increase income, and as a result, the number of livestock has increased every year.

Grazing and degradation is a direct factor in reducing the potential of the livestock sector, and has serious negative consequences of increased vulnerability to drought and other risks. Also, if joint measures are not taken on animal health, there is a tendency to decrease supply in the domestic and foreign markets and increase prices. On the other hand, it shows that there is a legitimate need to export meat. Nowadays, when the population is growing and the demand for meat is increasing, the introduction and sale of Mongolian meat to the world is a great opportunity to increase the income of the nation and people. As a result of this research, the following conclusions are drawn.

1. Policy documents supporting meat exports have been issued in connection with the country in question, but due to the size of the meat quota, the amount of exports is not increasing. Supply continues to be a problem due to the lack of a meat incentive system.
2. The law on animals and animal health has been approved, but insufficient implementation is reflected in the lack of increase in exports. In addition to the law, technical regulatory documents for meat have been approved, but there are still unclear issues regarding who is responsible and how to implement them.

3. The development and implementation of legal documents on the stabilization of domestic meat prices, establishment of healthy zones, quality and certification are not clear.
4. 90-95% of meat production is processed manually, which does not fully meet the demands of modern consumers. Also, meat processing plants operate seasonally.
5. Meat processing plants are not able to have factories, warehouses and transportation with dedicated equipment. This indicates that the capital renewal process is slow due to insufficient financial support.
6. Meat producers or herdsmen use non-industrial methods to kill their animals, they have poor understanding of veterinary clinics, hygiene and technology, and there is a lack of adequate supply of veterinarians. It does not meet export requirements.
7. There is no policy for the development of intensive meat farming based on feed resources in agricultural regions. Therefore, in this area, it is necessary to export value-added meat instead of live animals.

References

- [1] A. Bakei (2016) "Sustainable development of Mongolian pastoralism: theoretical and methodological issues" Ulaanbaatar
- [2] A. Bakei, B. Purev (2016), "Development of pastoralism" research report, Ulaanbaatar
- [3] D. Kadirbek, B. Purev, J. Batchuluun (2017) "Foreign meat market - resources, demand, needs, prices" Compilation of reports of the scientific conference on "Meat production and export", 2017/06, pp. 31-45, Ulaanbaatar
- [4] Mongolian Meat Association (2021) "Current Information" Ulaanbaatar
- [5] B. Khishigdavaa (2021) "Comparative study of legal documents for meat export" Tax and Business Journal 2021/06 No. 27, pp. 17-22
- [6] Z. Yadmaa (2014) "Production and export trends of livestock products" Ulaanbaatar
- [7] National Statistics Committee (2021) "Statistics Bulletin" Ulaanbaatar

SSBA-36

The Influence of Korean Vehicles Product Attributes on Consumer Satisfaction in the Mongolian Automobile Market

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Abstract: The purpose of this study is to investigate the relationship between the attribute's Korean vehicles, satisfaction in Mongolian vehicles market. This research examines how the cost economical factor, design, convenience, and functionality of Korean vehicles affect satisfaction. The survey has been conducted from February 15th to March 7th of 2023. Out of 190 questionnaires collected, 150 copies were used for the final analysis. The results of this study are as follows. First, in the relationship of product attributes with satisfaction, economic factors and design were found to have a negative effect on satisfaction. Second, in the relationship of product attributes with satisfaction, convenience and mechanism were found to have a positive effect on satisfaction. Based on these results, we will propose a contribute way to study future consumer behavior in the Mongolian automobile market, and suggest marketing strategies for Korean companies to ensure a competitive advantage in the Mongolian market.

Key Words: Mongolian vehicle market, convenience, mechanism, satisfaction

SSED-37

A study on the emotional intelligence of adolescents

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Abstract: From infancy, we learn emotional skills through our parents, the people around us, and events. Through emotional intelligence, a person himself lives up to social norms and expectations. If you cannot adapt quickly to this complex and diverse social life, you may experience psychological problems such as anxiety, worry, loneliness, etc. In particular, teenagers who are undergoing physical and mental transitions experience various changes in their bodies and need to adapt to the environment and society. This research was conducted using a test with 47 questions created by Mun Yoon-rin (1996) "Determining Emotional Intelligence" from a total of 109 teenagers aged 17-18, 54 males and 55 females, and the results were processed using the SPSS-26 statistical program. As a result of the research, 1.8% of the participants had weak emotional competence, 52.3% had medium emotional intelligence, and 45.9% had high emotional competence. Among the 5 indicators of emotional intelligence: "recognizing emotions", "expressing emotions", "understanding others", "regulating emotions", "using emotions", the lowest is "expressing emotions" -2.8%, "understanding others"-3.7%, and "recognition of emotions"-33.9% showed the need for further development.

Keyword: Emotional Intelligence, Adolescents

1. Introduction

Nowadays, more attention is paid to the emotions of teenagers. In particular, it has been included in the school curriculum, and teachers have started to work more attentively. There is a study by the National Center for Mental Health that 4 out of 40 teenagers in the same class are affected by psychological problems. According to a study conducted by the International Children's Fund, the suicide rate of children aged 10-14 was 11.4% in 2018, while in 2019, 30.5% of teenagers were found to have "emotional and behavioral problems". In 2021, M. Enkhsetseg "Results of studying the emotional intelligence of teenagers". When the research was carried out to investigate the level of emotional intelligence of teenagers living in care centers and teenagers living in family environments with parents, it was seen from the research results the emotional competence of teenagers in care centers is lower than that of teenagers living in family environments, and the environment and conditions affect the emotional competence of teenagers.

In 2021, G. Ichinkhorloo "Results of studying the emotional intelligence of teenagers". A total of 142 teenagers between the ages of 15 and 17 were included in the study. As a result of the study, it was found

that the emotional competence of these teenagers is below average and needs to be further developed. In order to determine the emotional competence of today's Mongolian teenagers, the Laboratory of General Education of Ulaanbaatar City, Bayanzurkh District, conducted a study on 109 students of the 12th grade of the 44th Secondary School. By investigating the level of emotional competence of teenagers, the results of this study are useful information for activities aimed at managing and controlling their emotions, behaving properly in public, and preventing them from suffering psychological problems. Within the scope of this research, the following objectives have been put forward: familiarizing with and summarizing the theoretical concepts of the psychological characteristics and emotional capabilities of adolescents, defining the research methodology, conducting statistical processing and comparison of the research results, and drawing conclusions based on the research results.

In the study, Moon Yoon-rin (1996) used a 47-item test to determine emotional competence, and this test measured the emotional competence of teenagers through 5 main factors: recognizing emotions, expressing emotions, understanding others, managing emotions, and using emotions. evaluates. Researcher Gordon Howard Bauer established that emotions affect memory. H. Bauer made a list of words that people used when they were in a different state of motivation, then recalled them later and studied them again when they were in a different state of motivation. According to him, if a person has determined information during an unhappy time, it is easy to recall it when experiencing the same unhappy time again, which he called motivation-dependent search. H. Bauer concluded that our emotions are stored together in our memory, which connects all the emotions and information happening around us. Therefore, when we recall stored information, recalling what was the motivation and emotional state at the time will make it easier to retrieve the information. He believed that emotion plays an important role in information style. When we are happy, we tend to focus on the positive aspects of things, while when we are sad, we tend to focus on the negative aspects. For example, H. Bauer discovered that unhappy people remember sad stories more clearly than happy ones they read before. On the basis of H. Bauer's idea, people use visuals decorated with emotions to communicate with each other. Thoughts and memory of past behavior depend on courage in the present (M.Delgerjav & B.Batsaikhan, 2013).

Emotional intelligence was first named by Salovey and Mayer, and then Daniel Goleman's book "Emotional intelligence" (1995) became a bestseller in "Time" magazine. He was the first to introduce EQ (Emotional Quotient) and since then EQ has been gaining attention. According to Daniel Goleman, the concept of emotional intelligence is based on Edward Thorndike's definition of social intelligence in 1920. Edward Thorndike defined "Social Intelligence" as "the ability to understand and manage people, or in other words, the ability to intelligently maintain human relationships." Salovey and Mayer proposed that individual differences and emotional intelligence are involved in a variety of cognitive and social problem-solving processes. They defined emotional intelligence as a sub-factor of social intelligence, which is the ability to use emotional information to control, differentiate, and act on one's own and others' feelings and emotions. Emotional intelligence was first named by Salovey and Mayer, and then Daniel Goleman's book "Emotional intelligence" (1995) became a bestseller in "Time" magazine. He was the first to introduce EQ (Emotional Quotient) and since then EQ has been gaining attention. According to Daniel Goleman, the concept of emotional intelligence is based on Edward Thorndike's definition of social intelligence in 1920. Edward Thorndike defined "Social Intelligence" as "the ability to understand and manage people, or in other words, the ability to intelligently maintain human relationships." Salovey and Mayer proposed that individual differences and emotional intelligence are involved in a variety of cognitive and social problem-solving processes. They defined emotional intelligence as a sub-factor of social intelligence, which is the

ability to use emotional information to control, differentiate, and act on one's own and others' feelings and emotions (Goleman, 1995).

The study "Emotional intelligence and academic success: Examining the transition from high school to university" conducted by James Parker, Laura Summerfeld, Marjore Hogan, and Sarah Majeski, professor of psychology at Trent University in Canada, was conducted on 372 students who entered the university for the first time (James, Laura, Marjorie, & Sarah, 2003). Students participating in this study were administered a short emotional competence questionnaire at the beginning of the school year, and at the end of the school year they were compared with their total scores and end-of-year data. The study participants were divided into 2 groups, the first group with 80% or higher grades and the second group with 59% or lower grades, and their emotional competence was compared. The results of the study showed that the group of students with higher grades also had higher emotional competence (Б.Нопов, 2022). Research at Case Western Reserve University's School of Management has provided students with opportunities to develop ways to assess and develop their emotional competencies in relation to their cognitive abilities. The study, conducted on students before they graduated and after a year on the job, showed that emotional competence can be developed and the results can be long-lasting (Ч.Батхшиг, 2016).

We used the 47-item "Emotional Competence" test created by Moon Yoon Rin (1996) as a tool for this research, and between March 20 and March 24, 2023, we conducted a paper survey of 125 children aged 17-18 years. 109 valid pages have been processed. The results of the research were processed using SPSS-26 program, reliability analysis, descriptive analysis, frequency analysis, and the difference of emotional competence depending on gender was analyzed using independent (group) t-test.

2.Results, Data Analysis

[Table 1]. Gender distribution

Male	Female	Total
54(49%)	55(51%)	109(100%)

[Table 2]. Test reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
.806	47

When examining the reliability of the emotional intelligence test of the respondents, the questionnaire $\alpha=0.806$, which indicates that the reliability of the test is satisfied.

[Table 3]. Descriptive Statistics

	N	Minimum	Maximum	Mean
The Appraisal of emotion	109	1.00	16.00	12.24
The Expression of emotion	109	.00	20.00	8.06
Empathy	109	.00	14.00	8.33
Regulation of emotion	109	.00	42.00	19.99
Utilization of emotion	109	.00	20.00	12.20

The mean value of "The appraisal of emotion" is 12.24, "The Expression of emotion" is 8.06, "Empathy" is 8.33, "Regulation of emotion" is 19.99, and "Utilization of emotion" is 12.20. From this, it can be seen that the ability to regulate emotions of the teenagers who participated in the study is at the highest level compared to other parameters, while the ability to recognize emotions and understand others is at the weakest level. Also, the ability to express emotions and use emotions is seen at an average level.

[Table 4]. Emotional competence scores by gender

	Gender				
	Male		Female		p
	Mean	Standart Deviation	Mean	Standart Deviation	
The Appraisal of emotion	12.03	3.2	12.45	1.9	.005
The Expression of emotion	8.31	3.54	7.81	3.09	.542
Empathy	8.09	3.09	8.56	2.88	.847
Regulation of emotion	19.70	6.28	20.27	6.43	.956
Utilization of emotion	12.44	4.10	11.96	4.62	.609

In this analysis, the p-value of the "The appraisal of emotion" ability is less than 0.05, so it was found that gender is related to the ability to recognize emotions. However, other emotional competencies such as "The Expression of emotion", "Empathy", "Regulation of emotion", and "Utilization of emotion" are greater than p-value <0.05, so it was found that gender is not related to these competencies.

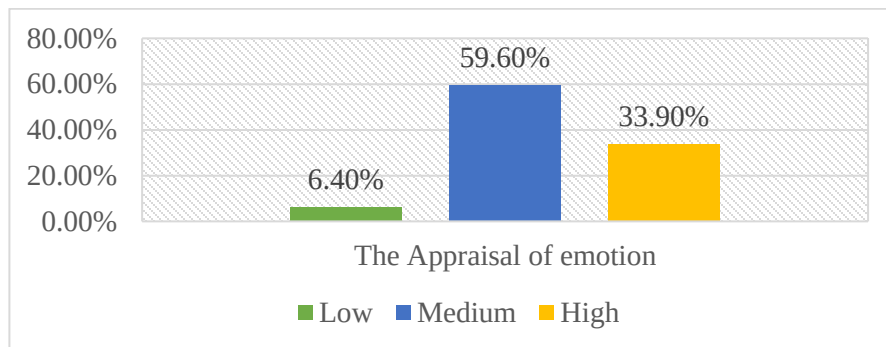
[Table 5]. Results comparing emotional competence and gender

	Gender	Number of participants	Average score	Average difference	P
Emotional Intelligence	male	54	60.5	-0.5	0.840
	female	55	61		

An independent (group) t-test was used to analyze whether the emotional intelligence of the 109 adolescents who participated in the study differed by gender, and the P value was 0.840 or greater than 0.05, and the result was that emotional intelligence was not related to gender.

1. The Appraisal of emotion

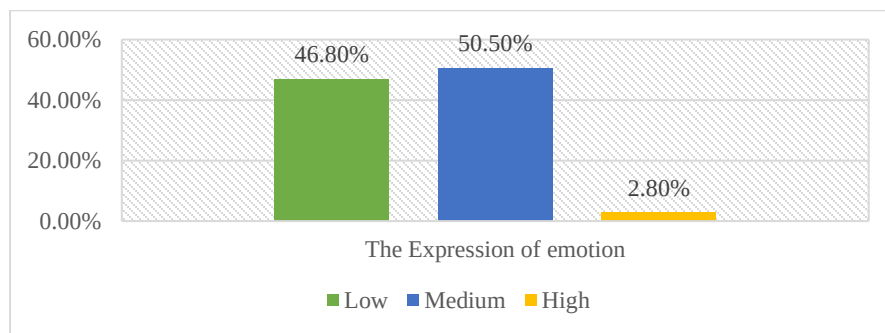
6.4% of the participants in the study have weak emotion recognition ability, 59.6% have medium emotion recognition ability, and 33.9% have high emotion recognition ability. The indicator of that ability is shown graphically.



[Graph 1]. The Appraisal of emotion

2. The Expression of emotion

46.8% of the participants in the study have weak abilities to express their emotions, 50.5% have medium abilities to express their emotions, and 2.8% have high abilities to express their emotions. The indicator of that abilities are shown graphically.

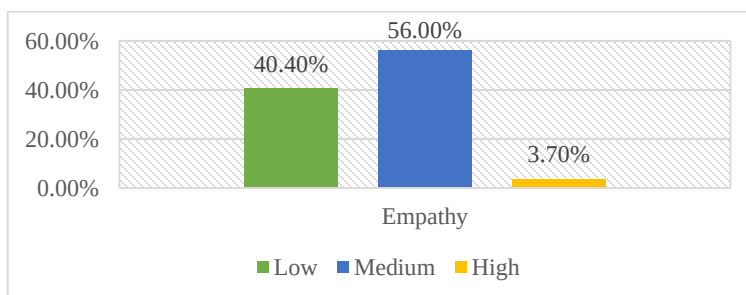


[Graph 2]. The Expression of emotion

3. Empathy

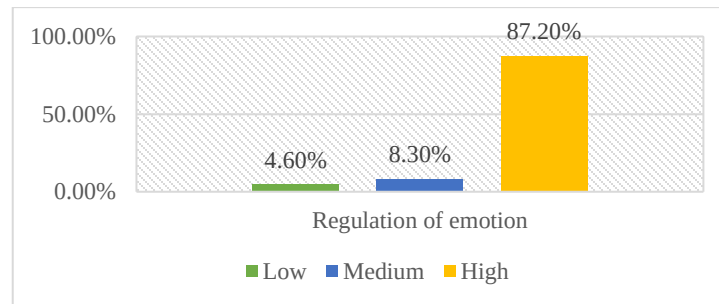
40.4% of the respondents have weak understanding of others, 56% have medium understanding and 3.7% have high understanding of others. The indicator of that abilities are shown graphically.

[Graph 3]. Empathy



4. Regulation of emotion

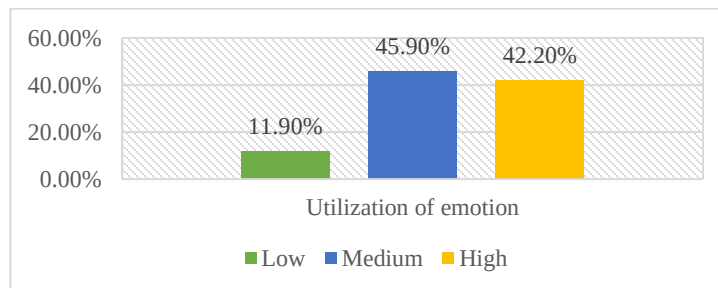
4.6% of the participants in the study have weak abilities to express their emotions, 8.3% have medium, and 87.2% have high abilities to regulate their emotions. The indicator of that abilities are shown graphically.



[Graph 4]. Regulation of emotion

5. Utilization of emotion

11.9% of the participants in the study have weak abilities to use their emotions, 45.9% have medium, and 42.2% have high abilities to regulate their emotions. The indicator of that abilities are shown graphically.



[Graph 5]. Utilization of emotion

5. Discussion, Conclusion

As a result of this research, we make the following conclusions. The results of the study show that Mongolian teenager's "The appraisal of emotion" and "The Expression of emotion" are weak. Therefore, he believes that in order for teenagers to recognize their emotions and express their thoughts openly, it is necessary for teachers, educators, and parents to be given them the opportunity to talk with their teenagers

and express themselves openly. Also, it is seen that the "Empathy" which expresses the ability to understand the emotions of others as one's own, is weak, so it is necessary to engage those teenagers in community activities, actively involve them in social relations, and promote content and advertisements about the kindness of understanding others. It is believed that it is necessary to carry out regularly. Also, the ability to "Utilization of emotion" to increase productivity was below average. The ability to use emotions is the most important skill for their future learning and work and needs to be developed further. For example, if a teenage think that he has lost a task that he worked very hard on, it is best to quickly forget that emotion and start over from the beginning instead of worrying about the lost task. According to the results of the study, among these five abilities, Mongolian teenagers develop the weakest abilities, such as "The Expression of emotion", "Empathy", and "The appraisal of emotion". But the most developed is the ability to "regulate emotions", while the average development is the ability to " Utilization of emotion". Based on this, it is concluded that it is necessary to regularly organize psychological training seminars for Mongolian teenagers and their caregivers, teachers, and educators, and to continue the activities and experimental research to increase the above emotional capabilities.

References

- [1] B. Norov. (2022). "Study of personality type, self-esteem and emotional competence of high school students". Ulaanbaatar National University, Master's research
- [2] D. Haliun. (2019). "An Examination of Self-Esteem and Adaptability in Adolescent Prisoners". Ulaanbaatar, MU, Undergraduate Research.
- [3] Ch. Bathishigh. (2016), "Relationship between students' position in the community and emotional competence". Ulaanbaatar, MU, Undergraduate research work, 17-18.
- [4] M. Delgerjav, B. Batsaikhan. (2013), "General Psychology", Soyombo Printing, Ulaanbaatar.
- [5] Goleman, D. (1995), "Emotional Intelligence", New York, Bantam Books.
- [6] James, P. D., Laura, S. J., Marjorie, H. J., & Sarah, M. A. (2003, January 27), "Emotional intelligence",
- [7] Salovey, P., & Mayers, J. D. (1990), "Emotional intelligence", New York, Basic Books
- [8] Kil, Kyung Suk. (2006), "A Study on the Effect of Parent's Rearing Attitudes and Social Support on Children's Emotional Intelligence", Korea, Korean Association of Child Care and Education.
- [9] Yoo Ja Gyung. (2005), "Effect of Emotional Intelligence and Orientations of Interpersonal Relations on Adolescent's Mental Health", Kyungnam University, Korea.
- [10] M. Delgerjav, B. Batsaikhan. (2015), "Dictionary of Psychology", Ulaanbaatar.

Analysis on Household financial sustainability, Impacts affecting on: on the example of Orkhon province

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Abstract: In order for the countries of the world to achieve a long-term sustainable and reliable economy, the government develops policy documents by considering social and economic indicators such as the living standard of the country's households, the poverty level, the human development index, the happiness index, and the financial status of the household, and implements the national programs. In this framework, the international researchers have been conducting research and development work since 1965, developing many methods such as household financial sustainability, well-being, and vulnerability index. In 2011, the University of Bristol of the Great Britain has developed the household financial wellness index method to evaluate the financial sustainability of households, and has continuously conducted research for 10 years on the example of households of South Africa and developed relevant recommendations. In 2015, Mongolia has developed "National Program for Financial Literacy" to ensure the sustainable economic growth by strengthening household financial situations and increasing the financial output. In order to do so, there is an urgent need to determine the current financial situation of the household, identify the influencing factors, develop improvement methods and recommendations. Therefore, on the example of households of Orkhon province, the financial sustainability of the household was determined using the index method and ratio analysis, and the analysis of the factors affecting was evaluated using the logistic model (or logit model). According to the results of the research, the financial sustainability of households living in Orkhon province households depends on many factors including their education, financial knowledge, income, and whether they are making short-term, medium-term or long-term financial planning. About 3.5% of households have a good financial situation, 50.75% have a sustainable financial situation, 40.5% have an unsustainable financial situation, and 5.25% have a crisis. These households have a high risk of having unsustainable financial situation and less probability for the improvement. According to our results, in order to ensure long-term economic growth by making the financial situation of households sustainable and reliable in the future, it is necessary for the government to develop policy documents and implement short-term and long-term programs.

Key words: Micro index, macro index, disordered, distressed, unstable, unemployment, gross domestic product, weight coefficient

The correlation between entrance exam and students' performance at school of technology in Darkhan-Uul, Must

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Abstract: Entrance exams are a common method used by Mongolian universities to filter and choose students for their programs. It is unclear whether admission examinations are a reliable indicator of a student's future success at the institution, despite the fact that they offer a standardized testing procedure. This study was analyzed by examining a set of raw data on students' entrance exam results and college performance during their first semester at the university. We performed statistical analysis for the entire group as well as by gender and MATLAB was used to perform the analysis. The study performed demonstrates that there is no link between the results of the entrance exams and those obtained at universities for the supplied data set. Furthermore, there were no significant differences in entrance exam results and university outcomes, between male and female students.

Keywords: performance, MATLAB, score, exam, university

1. Introduction

One of the ways to improve the quality of the educational process in higher education is a scientific study of the problem of student learning success. What is learning success? What are the causes and conditions of unsuccessful training and what are the ways to overcome them? These are some of the questions that higher education needs answers to. Academic achievement is a student's position in fulfilling their academic conditions; As usual, students follow the teacher's instructions and use the means to understand homework and read comprehension clearly. Too often, student achievement in the classroom is attributed to their academic ability, the way teachers teach, the lab facilities and the academy's campus; upon meeting the requirements, scholarship recipients are likely to succeed and graduate on time. Most graduate programs require students to meet some basic academic requirements to be considered for admission. A globally accepted notion is that due to stark differences in the quality and grading systems of secondary schools, it would be highly unfair that admissions decisions were based solely on high schools. The current study was conducted to compare the performance of students in the entrance exam to the school and their scores after admission. Subjects are students who have passed the Joint Entrance Examination at Darkhan-Uul School of Technology, MUST and were admitted midway through the academic year 2022-2023. We performed statistical analysis for the entire group as well as by gender and MATLAB was used to perform the analysis.

2. Survey Research

2.1 General Entrance exam

The results of the Common Entrance Examination will be communicated to policymakers, teachers, and researchers in general education schools in an open, accessible, and rights-based manner, thus improving feedback to the education sector and introducing the PEE statistical reporting system, intended to support decision-making, policy-making, implementation, and benchmarking. In Mongolia, the quality of education at all levels has become a pressing social issue. The Assessment represents the result of quality education, and it is at all levels of education. Organizations do the assessment, but it is the knowledge, skills, and practices that individuals are unable to express. Students are the future of the country, still young. Therefore, it is important to prepare students to become competent employees and citizens. It is one of the important roles of the school. However, the academic achievement of students not only affects the school but also affects the interest in learning and the results of students. There is an urgent need to study the many existing factors.

The general entrance exam is not an ordinary semester or promotion exam, but a very responsible step in determining one's future life goals. According to the theme that graduates have passed the general entrance exam, they will further define their future life by obtaining a career based on this topic. Therefore, it is very important to study how overall entrance exam scores are related to graduate student academic achievement. Some researchers say: "The high school entrance exam is a competition. Therefore, it is not possible to measure the quality of teaching. Conversely, if the general entrance exam is a measure of the quality of education, its scores can also be used to measure the academic achievement of students admitted to a university. One way to address this uncertainty is to examine the relationship between graduates' academic performance and overall admission test scores, standardized admission tests – standardization, efficiency, and opportunity and because of the difference in high school, and curriculum standards. Also, course content and standards in grading can be eliminated due to such tests. Efficiency is possible because standardized admission tests can be conducted at a relatively low cost to students and are economical and efficient for the institutions as they have the possibility of comparing vast numbers of applicants within a short period. Many studies have empirically verified the relationship between future academic performance and the combination of both standardized test scores and high school GPA.

The general entrance exam is not an ordinary semester or promotion exam, but a very responsible step in determining one's future life goals. According to the idea that graduates have passed the general entrance exam, they will further define their future life by obtaining a career based on this topic. Therefore, it is very important to study how overall entrance exam scores are related to graduate student academic achievement. Some researchers say: "The high school entrance exam is a competition. Therefore, it is not possible to measure the quality of teaching. Conversely, if the general entrance exam is a measure of the quality of education, its scores can also be used to measure the academic achievement of students admitted to a university. One way to address this uncertainty is to examine the relationship between graduates' academic performance and overall admission test scores. Standardized admission tests – standardization, efficiency and opportunity because of the difference in high school curricula. Standardized course content and standards in grading can be eliminated due to such tests. Efficiency is possible because standardized admission tests can be conducted at a relatively low cost to students and are economical and efficient for the institutions as they have the possibility of comparing vast numbers of applicants within a short period of time. Many studies have empirically verified the relationship between future academic performance and the combination of both standardized test scores and high school GPA. According to the Constitution of Mongolia, the government must provide 12 years of free general education. At the end of 12th grade, students must take a joint entrance exam if they want to attend university. Although students choose the

exam based on their chosen field of study, since 2013, every student is required to take the Mongolian language exam. The maximum score for this exam is 800 and each year MECSS sets a minimum score for admission to public and private universities. In 2019, the minimum MECSS approved score is 480 out of 800 for admission to public universities, 410 for admission to private universities and 400 for admission to local universities. The result of this exam allows students to enter Mongolian universities and students who pass the exam can get a scholarship from MECSS. [3] In Mongolia, as of the academic year 2021-2022, there are 37 (42.1%) universities, 48 (54.5%) academies (including 3 branches of foreign institutes), 3 (3.4%) colleges (these are the only 3 colleges under the Ministry of Education and Science), out of a total of 88 higher education institutions. 65 of them are private, 20 are state owned, 3 are public/sectoral organisations. 79 are located in Ulaanbaatar, only 9 are located in rural areas. Every year, the Ministry of Education and Science sets the required score for the General Entrance Examination. For the academic year 2021-2022, the standard scores in the general entrance exam are: • For universities and public academies: 480+ • For private universities, academies, colleges: 410+ • For universities, academies, colleges in rural areas: 400 +. According to the statistics of the school year 2021-2022, there are more than 40,000 young people registered for the high school entrance exam: 73.5% chose to take the math exam. [4] According to the latest research conducted by the Ministry of Education and Science, 39,000 engineers and technicians will be needed in the next 5 years to implement and pursue large-scale projects and programs in Mongolia. However, in the past 5 years, only 14,000 professionals have been trained in this field. Therefore, it is necessary to determine the number of jobs, projects and development programs and professions needed in society based on research and calculation. Experts also believe that choosing a profession that is in high demand will help young people have more job opportunities, avoid unemployment and poverty.

2.2 Grading and credit system

The credit hour system is considered to be a basic tool to measure the student learning load, the volume of academic work of a lecturer, an instrument for calculation of tuition fees for the programme as well as a regulatory mechanism to plan, finance and organise activities necessary for delivery of higher education. The introduction of a Credit-based system in training started in 1997 in Mongolian University of Science and Technology (MUST). This system is based on the principle of mutual trust between institutions participating in higher education, which is why many universities have adopted it. Taking these considerations in mind, scholars and competent authorities of Mongolian education sector have tolerated the Creditbased system that has been reflected in the Mongolian Law on Education.

Table 1. The Degree Structure of MUST

Programs	Duration	Credits	Entry Requirements
Bachelor's programmes	4 years or 8 semesters	120-130	Graduation from Secondary School, Vocational Technical School or Technical College
Master's programmes	Min 1.5 years or 3 semesters	30-36	Bachelor's Degree
PhD Programmes	Min 4-6 semesters	60	Master's Degree

Student learning during the semester will be assessed by the teacher above 70 points and the actual level of knowledge will be assessed above 30 points through the semester exams. This total will be 100 points, which will be converted to an alphabetical rating using the table below. Table 2. Student's

Table 2. Assessment Point of MUST

Assessment Point	Alphabetical assessment	GPR
95-100	A	4.0
90-94	A-	3.6
85-89	B	3.1
80-84	B-	2.7
75-79	C	2.3
70-74	C-	1.9
65-69	D	1.4
60-64	D-	1.0
0-59	F	0

3. Methods

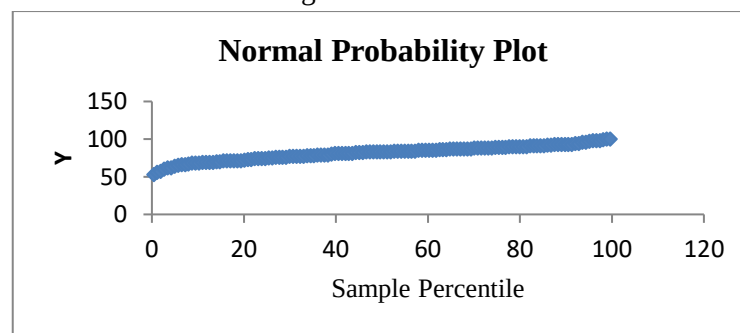
This study was carried out based on the mathematics score of the 2022-2023 entrants of Darkhan School of Technology and the student's Mathematics 1. 229 students who are majoring in 10 specialties at the university participated in the sample. Analysis is performed by finding relationships between variables, determining their shape, evaluating those relationships, and estimating unknown values of the dependent or outcome variables. In this study, a regression equation was developed and analyzed by treating the GEE score as a predictor and the entrance semester score as an outcome variable. Excel 2013 and MATLAB were used for this calculation. Results of the entrance examination were collected from the Institutional Admissions and Testing Office. Grades of the respondents were gathered from the Academic Office of the university.

4. Results, Data Analysis

4.1 Results

We have selected students' Mathematics scores of GEE and the academic performance of Mathematics 1. The GEE score predicted the student's educational success, and a corresponding regression equation was derived.

Correlations between the mean entrance examination scores and academic performance following admission Figure 1. Scores of GEE



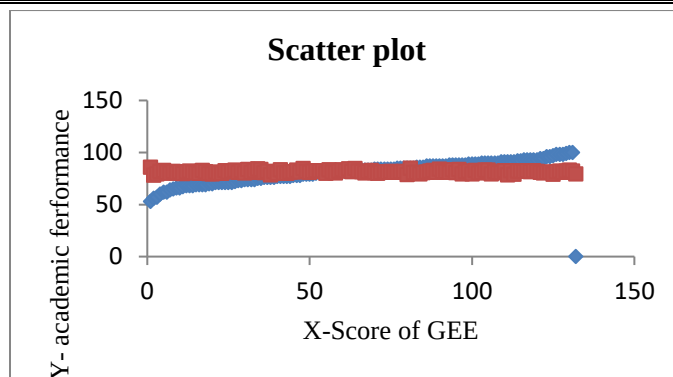


Figure 2. Correlations between the mean scores for the entrance examination and academic performance following admission

Correlations were examined between the mean scores in the entrance examination and academic performance following admission. (21/1000) words

The results show the same correlation coefficient of $r=0.020192615$, indicating no difference in mean score results. The regression equation was $y=71.619+0.020x$. It shows that a one-point increase in the GEE score may increase the quarter grade by 0.02 points or 2%.

1. Correlation between entrance exam math test scores and performance after admission

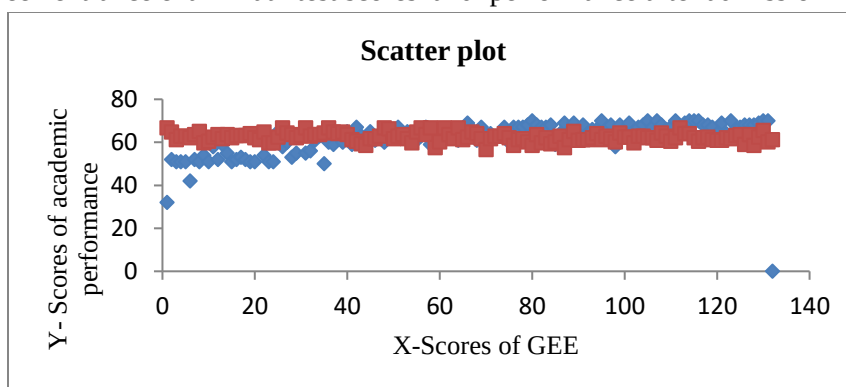


Figure 3. Regression Result of the different categories of the Entrance Exam Result

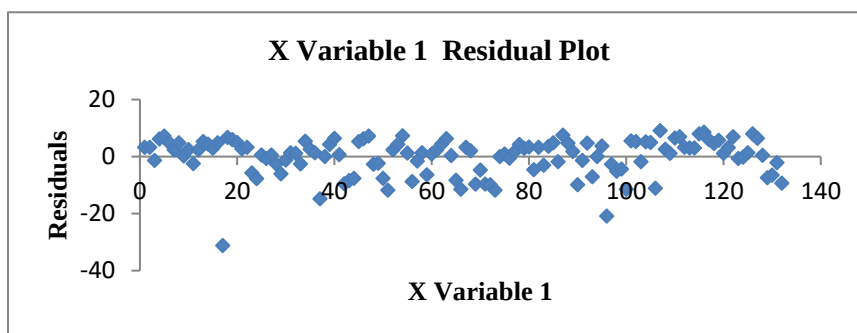


Figure 4 Scatter plot of academic performance and the Entrance Exam Result

The correlation coefficient $r= 0.100914018$ shows that the progress of the Mathematics 1 course, 70 points, and the result of the semester, 30 points, is very weakly and positively correlated. The regression equation is $y=55.116+0.386x$. According to this equation, if the progress grade of Mathematics 1 increases by one unit to 70

points, the semester grade of 30 points will likely increase by 0.38 units or 4%. It means that 70 points in the Mathematics 1 course has a minimal effect on the 30 points of the semester.

2. Relation of scores of male and female students

30 female and 199 male students majoring in 10 specialties participated in the study.

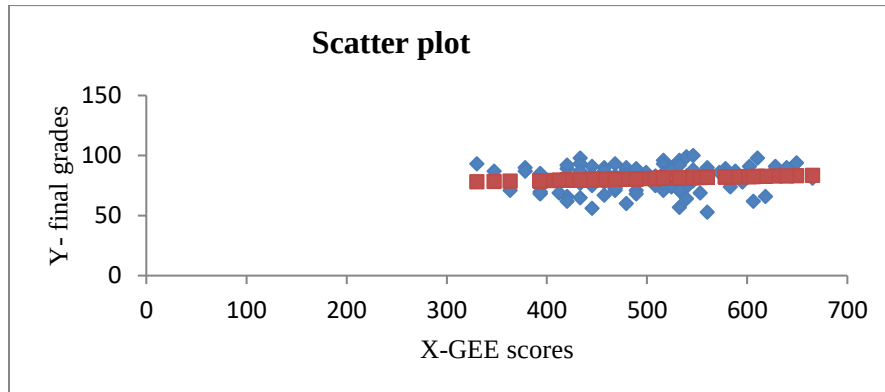


Figure 5. Scatter plot of academic performance and the Entrance Exam Result of male and female students

The correlation coefficient was $r = 0.012312$. It can be seen from this that there is no relationship between the IEP score and semester grades of male students. The regression equation is $y = 72.699 + 0.016x$, and when the IEP score of a male student increases by one unit, the semester's grade is likely to increase by 0.01 units or 1%. It does not affect male students' GPA scores and semester results.

5. Conclusion

It is noteworthy that the Mathematics scores of the general entrance exam and the final scores' results of Mathematics 1 are unrelated. The reasons for this need to be determined, and the fact that the correlation is stable or increased increases the importance of the GEE. Currently, the GEE score, the only criterion for admission to the university, has a negligible impact on the success of the student's future studies. In addition, it is advisable to consider the academic performance of the high school, which has a more significant impact on the university's academic success, in the admission criteria.

References

- [1] Kuncel, R., and Ones, S., (2001), "A comprehensive meta-analysis of the predictive validity of the Graduate Record Examinations: Implications for graduate student selection and performance," *Psychological Bulletin*, pp. 162~181.
- [2] Burton, W., and Wang, M., NJ.(2005), "Predicting Long-Term Success in Graduate School: A Collaborative Validity Study," Education Testing Service, Princeton,
- [3] Bowen, D., (1998), "The shape of the river: Long-term consequences of considering race in college and university admissions.," *Princeton University Press*,
- [4] П.Ариунболор. (2020), "Инженерчлэлийн Матлаб программчлал", Улаанбаатар хот.
- [5] Ө.Цэрэн. (2012), "Магадлалын онол, математик статистик", Улаанбаатар хот.

SSCS-40

A Comparative Study of value Orientations and life Style of Students of the First and Fourth year at School of Technology in Darkhan-Uul aimag

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Abstract: The article is devoted to the formation of value orientations of students and the influence of values and value orientations of a person on a person's life, on the general life plan and on setting and achieving life goals. Youth is a special socio-demographic group, which, on the one hand, adapts to future changes, and, on the other hand, forms the image of the future and carries out the function of its social reproduction. Therefore, the publication touches upon the concepts of "values", "value orientations", provides an analysis of the concept of "life style", presents the results of an empirical study, and a study of the system of life meanings, as well as statistical processing of the data obtained, their systematic and qualitative analysis to identify the relationship of value orientations and life style of the individual on the example of diagnostic indicators of students of the first and fourth years of study. A comparative and comparative analysis of the value orientations of first and fourth year students was made in order to identify differences.

Keywords: individual; instrumental values; terminal values; values; value orientations

1. Introduction

Over the past few years, interest in the problem of studying the value orientations of a person has increased in psychological science. The problem of studying value orientations for psychology does not lose its relevance also because today: firstly, in psychological science there is no single approach to the interpretation of the concept of "value orientations"; secondly, the changes taking place in our society entail changes in the value orientations and actions of people; thirdly, value orientations have always been and are the determinants of the formation of a person's life style. [1] Certain values underlie judgments, decision-making, behavior, even individual actions of a person. Almost any activity is undertaken by a person and society on the basis of their specific orientations, aimed at certain values recognized by them. In accordance with this orientation, human activity receives a certain vector for something, and can be either constructive or destructive, and more or less effective, successful. Since value orientations are one of the main parts of the formation of individual characteristics of a person, they cannot but influence its "life style" (an individual way of achieving life goals by a person that determine the vector of his life), as an important mechanism for regulating activity. Therefore, the study of the relationship between value orientations and lifestyle is of great importance for society. [2] In particular, youth, which is a special socio-demographic group, which, on the one hand, adapts to future changes, on the other hand, forms the image of the future and plays the role of social reproduction, preserves the continuity of traditional norms and values, and what changes in

the younger generation? How does the value orientation of young people affect their way of life and is there a connection between the value orientation and a person's lifestyle? In order to determine whether there is a relationship between value orientations and a person's lifestyle, we conducted an empirical study among first and fourth year students. We assumed that the hierarchy of value orientations of students of the first and fourth years of study is different, and therefore, their life styles are also different. [3]

The purpose of the study is to reveal the relationship between value orientations and the life style of a person. The object of the study is the value orientations of the individual. The subject of the study is the relationship between value orientations and the life style of a person.

In accordance with the purpose of the study and the hypothesis put forward, the following research tasks were set in the work:

1. Familiarize yourself with theoretical studies of values, value orientation and lifestyle and generalize them.
2. Conduct an empirical study of the value orientations and lifestyle of the individual and describe the features of their formation in adolescence.

The hypothesis of the study was the assumption that there is a relationship between value orientations and the life style of an individual.

2. Theoretical Framework of Research

2.1 Values and value orientation

Professionals from various scientific fields study values, which are an interdisciplinary concept. It is discussed in philosophy, pedagogy, sociology, ethics, or psychology, but laypeople also frequently use it in daily life. The majority of axiologists give a value to anything that makes people happy, feel necessary or useful, strive for, or value. Kuerová observed that while values can exist without a subject because they can only become values if they can satisfy or dissatisfy its needs, objects and phenomena can exist without a subject. The relationship between an object's quality and the quality of the subject of the evaluation gives rise to values. [4] The work of Grác, which is still a popular place to start for many empirical studies on value orientation, is frequently used as the foundation for the terminological operationalization of value orientation in Slovak scholarly literature. Value orientation, according to him, is the process by which certain phenomena and objects are reflected in people's values and systems of values, steering human behavior in a particular direction. Based on the information at hand, it is possible to infer that value orientation refers to the propensity to prioritize one set of values over another while also acting as a consistent and long-lasting set of values that governs people's behavior. [5] Values are the concepts and beliefs that people use as a basis for making decisions, evaluating themselves and others, and making judgments. Value is a persistent desire of a person to live according to established social norms, not limited by current or temporary circumstances. It is also a guiding concept in life and is central to a person's belief system. Value orientations in Russian psychology are considered as a system of value orientations is defined through the concept of personality orientation, understanding by this a certain generalizing principle, covering all areas of the human psyche from needs to ideals as a leading substructure of personality. Value is the objective significance of phenomena as guidelines for human activity. The orientation of the individual is a set of stable motives that guide the activity of the individual and are relatively independent of the current situations. [6] Value is a set of norms that are widely recognized in a social organization. People can correlate and mediate their interactions with one another thanks to these patterns. Values serve as a framework for socialization in humans and aid in systematizing and interpreting social interactions. Any object can serve

as a focal point for the aspirations and desires of individuals or groups, which is thought to be a necessary condition for existence. Social norms of all kinds are used to put values into practice. [7].

2.2 Quality of life

As the concept of quality is widely discussed from a variety of angles in a range of contexts at the societal level. The relationship between the quality assessment process and a variety of phenomena and circumstances must be taken into account. A feature that sets one phenomenon apart from another is quality, which is generally defined as an assigned value expressed on a scale from excellent to poor. e. a person's life as seen through the eyes of another. [9] "Lifestyle" is another idea connected to personality development and this idea introduced into psychology to describe the characteristics of the dynamic theory of personality. In his concept, he offered what he believed to be a singular method of life adaptation for the individual. This was especially true of the tasks and methods the person chose to use to achieve the life goals they had set for themselves. According to Adler, a person's lifestyle consists of a special mix of characteristics, habits, and behaviors that, when combined, paint a distinctive portrait of that person. So, A. Adler provides the following definition of "Lifestyle.". The significance that a person ascribes to the world and to himself, his aspirations, his goals, and the methods by which he approaches life's problems. This leads us to the conclusion that, if not identical, these two concepts are at least very similar. According to the authors, individual patterns of behavior—primarily those formed in early childhood—are the foundation of both the "lifestyle" and the "script," which are both based on a variety of influences. [9]

At the beginning of the twentieth century prominent domestic scientist N.A. Rybnikov turned to the problem of the life path. He was engaged in the study of biographies, and based on this, he proposed a methodology for the biographical study of the spiritual life of a person (psychogram). According to N.A. Rybnikova: "The life path is the history of the realization of the abilities inherent in a person in specific socio-historical conditions that prevent or favor their manifestation". Following Rubinstein, she proposed to consider the life path of the individual in its entirety. In her opinion, the strategy of life is to uncover and resolve the true causes of contradictions, and not to avoid them through life changes. Proceeding from this, she proposed the term "life strategy", by which she understood the individual organization, the constant regulation of the course of life in accordance with the values of this person and his individual orientation. A life strategy is a choice, definition and realization of life values [10]. Another researcher of life strategies, V.N. Druzhinin in his hypothesis relies on the idea that "... there are variants of life that are independent of the individual, invented by mankind and reproduced in the lifetime. A person, depending on specific circumstances, can choose one or another option, but the option of life can be imposed on him. The degree of freedom of the individual and the measure of pressure on him from the outside world - the social environment - depend on specific historical conditions. The concept of "life option" is an integral psychological characteristic of individual existence and is determined by the type of a person's attitude to life. The variant of life forms the human personality, "typifies" it. The individual turns into a representative of the "life personality type". [11] According to the unanimous opinion of many researchers dealing with the problem of value orientations, despite the specifics of approaches to it, the system of value orientations largely determines the formation of a person's personality.[12]

3. Methods

Participants :

The study was conducted in School of Technology in Darkhan-Uul aimag. The study involved 107 respondents (58 students in the first year and 50 students in the 4th year). to identify and describe the relationship between value orientations and the life style of a person.

Research material and tools:

The object of the study is the value orientations of the individual and subject of the study is the relationship between value orientations and the life style of a person.

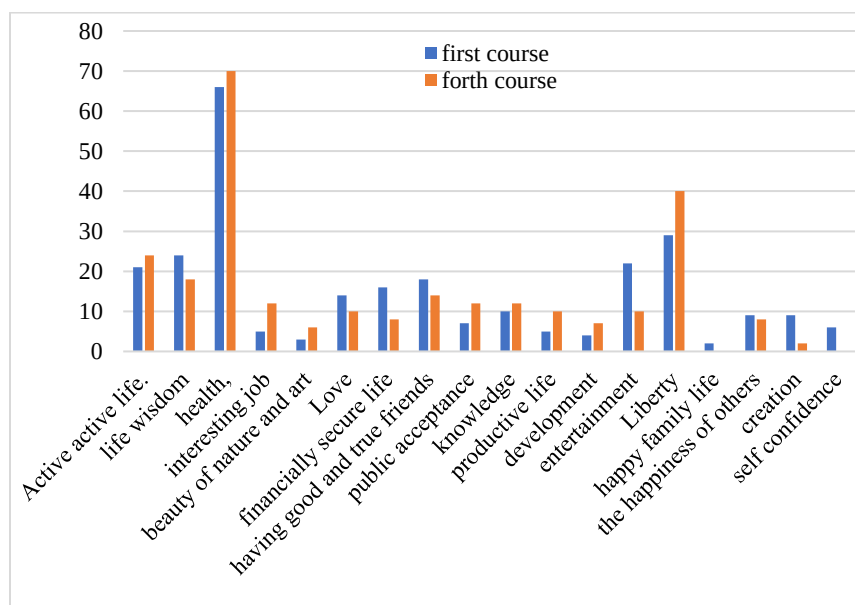
Procedure and measure :

The following methods were used in the study : the

“Value Orientations” method by M. Rokeach; methodology for studying the system of life meanings, statistical - methods of measurement, mathematical processing of empirical data, and systematic and qualitative analysis, graphical interpretation.

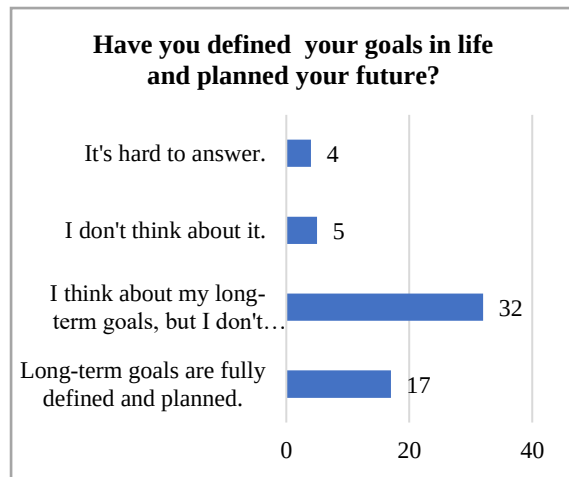
4. Results, Data Analysis

The purpose of the study is to identify and describe the features of life-purpose orientations of today's university students. We tried to determine which value orientations prevail among the members of these two groups in order to further determine how they affect the life style of them. Diagnostics was carried out using the method "Value Orientations" by M. Rokeach. After processing, we compared the terminal values of the two groups and the results were shown in Figure 1.

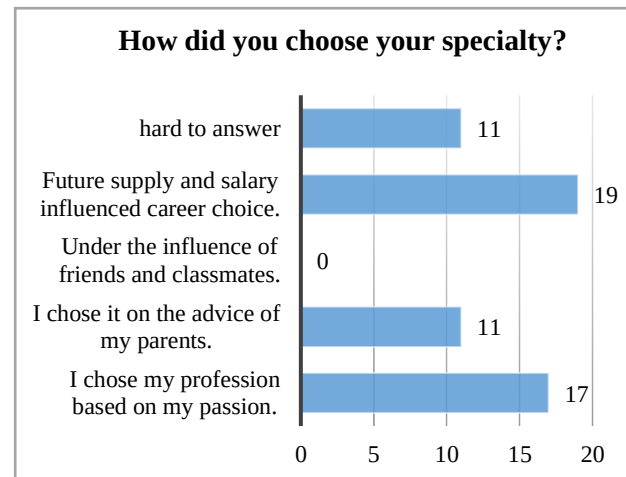


[Figure 1]. Percentage distribution of respondents by groups by terminal values

According to the finding shown in Figure 1, the priorities for the most part of the first-year students are the following values: health, having good and true friends, freedom, entertainment, financially secure life. Little significant values were such as: the happiness of others, development, knowledge, the beauty of nature and art. The students of two groups were offered the author's questionnaire "How did you choose your speciality?" and "Have you defied your goals in life and planned your future?"



[Figure 2] Speciality values



[Figure 3] Life goal

The responses of first year students is shown in the Figure 2 and 3. The highest scores achieved by our respondents in the field of speciality values was 32.7 % - salary influenced career choice and no one answered that friends and classmates influence. 31.85% of students have already defined your long-term goals. In our opinion, this circumstance is due to the fact that the subjects of the first group are more dominated by the needs of an entertaining nature, which is associated with unformed ideas about their future, both personal and professional. For boys and girls of the first year of study, a peculiar consumer attitude towards their time is more characteristic. Ideas about the chosen profession and further professional activity are vague. In addition, many of them chose the university not at their own discretion, but at the choice of their parents, who proceeded from their own "ideas" about the prestige of the profession and the possibility of earning money or career growth. In this regard, many of them do not perceive learning as the main value, which leads to a low ranking value of such values as interesting work, development, knowledge, life wisdom. A portion of the respondents, on the one hand, equates values and quality of life with strong interpersonal relationships, but a different portion of the respondents, on the other hand, is unaware of the benefits of interpersonal relationships in the context of their value orientation.

The importance of instrumental values is shown in Figure 4.

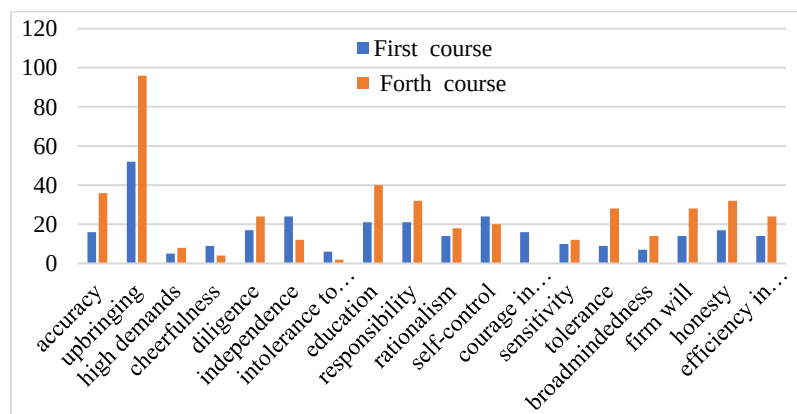
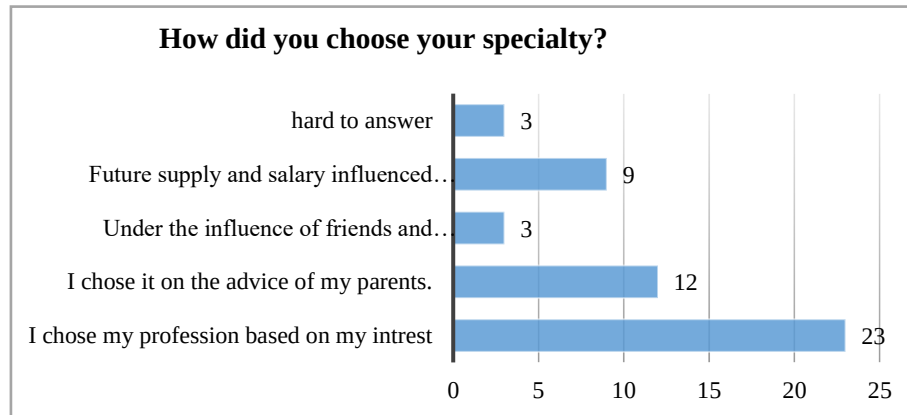
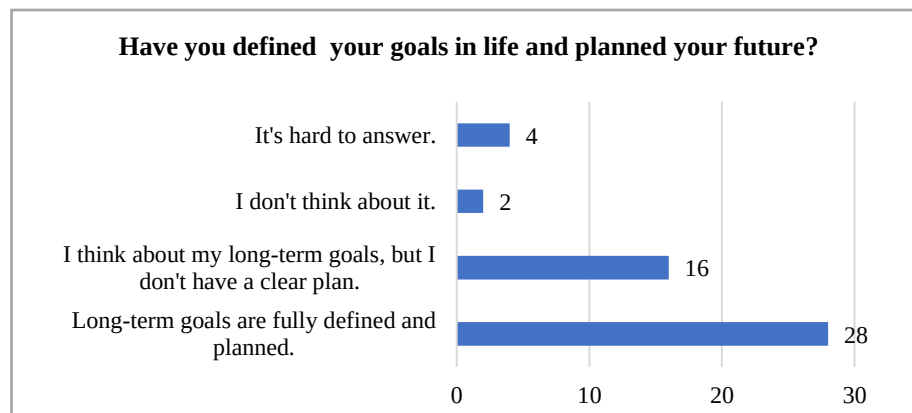


Figure 4 importance of instrumental values

According to the findings in Figure 4 , it can be noted that among the instrumental values, for the first group, the most significant are: courage in defending one's opinion, one's views, self-control, independence, intolerance to shortcomings in oneself and others, cheerfulness. For the second group, preference is given to such instrumental values as accuracy, good breeding, education, diligence, responsibility, efficiency in business, broadmindedness, rationalism. Among the least significant in the first group are efficiency in business, sensitivity, tolerance, education, high demands, and for the second - intolerance to shortcomings in oneself and others, cheerfulness, independence, courage in defending one's opinion, one's views.



[Figure 5] Specialty values for students of the 4th course



[Figure 6] Life goal for students of the 4th course

According to the findings shown in Figure 5 and 6, among the instrumental values, for the first group, the most significant are: courage in defending one's opinion, one's views, self-control, independence, intolerance to shortcomings in oneself and others, cheerfulness. For the second group, preference is given to such instrumental values as accuracy, good breeding, education, diligence, responsibility, efficiency in business, broadmindedness, rationalism. Among the least significant in the first group are efficiency in business, sensitivity, tolerance, education, high demands, and for the second - intolerance to shortcomings in oneself and others, cheerfulness, independence, courage in defending one's opinion, one's views.

These instrumental beliefs show which mode of action or personality trait is preferable for the respondents of the two groups. It can be seen that in the second group, judging by the ranking, the majority of respondents are the most acceptable values - means such as a high level of discipline, a sense of duty, hard work,

efficiency in professional activities, the ability to understand and accept someone else's point of view, as well as the ability to soundly and logically reason and make decisions. Based on the fact that students in this group are graduates, we can say that they are more concerned about their future professional activity, and they associate their plans and the implementation of personal goals with it, since all of the listed values - means are directly or indirectly related to profession.

For the respondents of the first group, values are more acceptable - means associated with the ability to act independently, restraint, defending one's own opinion and interests, intransigence and a negative attitude towards shortcomings in oneself and others, optimism and a sense of humor. We can say that these values - means to a greater extent emphasize such a psychological feature of adolescence as youthful maximalism. To determine the interdependence of value orientations on the life style of the individual and based on the fact that the most important component that affects the life styles of the individual is the life meaning of the individual, we carried out Diagnostics using the method of studying the system of life meanings.

[Table 1] Percentage indicators on the prevailing categories of life meanings

	Dominant category		Categories are presented enough		Categories are poorly represented	
	1 course	4 course	1 course	4 course	1 course	4 course
Altruistic	2	6	22	14	76	80
Existential	41	30	34	44	25	26
Hedonistic	2	0	18	12	80	88
Self-realization	48	50	34	34	18	6
Status	52	46	32	42	16	12
Communicative	33	50	44	36	23	14
Family	45	62	40	18	15	20
Cognitive	45	38	46	46	9	16

The data obtained during the diagnostics allow us to say that, as with the previous results, the life meanings in both groups differ significantly. So, for the first group, the categories of life meanings correspond more to personal and family development, and in the second group, to personal and professional development.

The data obtained in the process of conducting an empirical study give reason to say that the research hypothesis is that there is a relationship between value orientations and the life style of a person, in particular:

- value orientations determine the main direction of a person's life style, influencing life goals;
- the life style of the individual determines the change and deformation of value orientations for life goals, has been confirmed.

5. Conclusion

In the course of our research, we were able to determine that there are noticeable differences in terminal values between first-year students and graduate students. So, we found out that for most of the boys and girls of the first year of study, a peculiar consumer attitude towards their time is more characteristic. Ideas about the chosen profession and further professional activity are vague. In contrast, graduate students are dominated by values associated with an independent life, which they enter upon completion of vocational training, which makes special demands on the individual.

The difference was also identified in the hierarchy of significance of instrumental values. For first-year students, instrumental values to a greater extent emphasize such a psychological feature of adolescence as youthful maximalism. In the group of graduate students, the highest priority was given to values that characterize a high level of discipline, a sense of duty, diligence, efficiency in professional activities, the

ability to understand and accept someone else's point of view, as well as the ability to rationally and logically reason and make decisions.

Statistical processing of the obtained data showed that the differences in the frequency of choosing terminal and instrumental values of first-year students and graduates are statistically significant. This indicates that during the period of study, students have a statistically significant change in priority in value orientations. The definition of life meanings allows us to say that in the group of graduate students for the largest number of them, the important categories of life meanings are self-realization, status, cognitive life style and communicative, that is, those life meanings that, in principle, are aimed at a long-term perspective and are associated with life achievements. . Unlike them, for most of the students of the first year of study, the main categories of life meanings were defined as existential, communicative, family, hedonistic. There is a little difference between the first and forth course students on view of life values, the life values of the majority of first-year students were identified as existential, relational, family, and hedonistic.

The data obtained during the diagnostics showed that, as in the case of value orientations, the indicators of life meanings in both groups differ significantly. So, for students of the first year of study, the categories of life meanings correspond more to the personal and family meaning, and for the fourth year of study, to the personal and professional meaning.

References

- [1] Алишев, Б.С. *Психологическая теория ценности: Системно-функциональный подход* // Б.С. Алишев // диссертация на соис. степени доктора психологических наук: 19.00.01 – Казань, 2002 – 367 с.
- [2] Адлер, А. *Индивидуальная психология и развитие ребенка*. 2017. – М.: Институт общегуманитарных исследований, – 176 с.
- [3] Ананьев, Б.Г. *Человек как предмет познания* // Б.Г. Ананьев – СПб.: Питер. 2001. – 288 с.
- [4] Rokeach, M. *The nature of human values*. New York. 1973.
- [5] Krásna, S. (2014). *Subjective understanding and individual interpretation of the life value "HEALTH" by the second-year students of lower secondary schools and of the first- and second-year students of upper secondary* Acta Educationis Generalis Volume 10, 2020, Issue 1 80 schools in Slovakia. Acta Technologica Dubnicae, 4(2), 1-18. <https://doi.org/10.1515/atd-2015-0001>
- [6] Allport G.W., Vernon P.E., Lindzey G. *A study of values*. Text. - Boston: Houghton, 1980
- [7] Ananyev BG *To the psychophysiology of the student age*. Text. // Modern psychological and pedagogical problems of the higher school. L., 1974. Issue. 2. p.3-15.
- [8] Adem Öcal *A Comparative Study on Value Tendency of University Students: an international perspective* Citizenship, Social and Economics Education Volume 11 Number 1 2012
- [9] Buhler C., Massarik F. *The Course of Human Life: A Study of Goals in the Humanistic Perspective*. N.Y., 1980
- [10] Rokeach, M. (1979). *From the individual to institutional values with special reference to the values of science*. In M. Rokeach (Ed.), *Understanding human values* (pp. 47-70). New York, NY: Free Press.
- [11] Schwartz, S. H. (1992). *Universals in the content and structure of values: Theory and empirical tests in 20 countries*. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 1-65). New York: Academic Press. [http://dx.doi.org/10.1016/S0065-2601\(08\)60281-6](http://dx.doi.org/10.1016/S0065-2601(08)60281-6)
- [12] Дружинин, В.Н. *Варианты жизни: Очерки экзистенциальной психологии* / В.Н. Дружинин – М. – СПб.: Персэ, Иматон-М, 2000. – 210 с.

SSD-41

The results of the inspection of the financial statements of the public organizations /In the case of Darkhan-Uul aimag/

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Abstract: Through the comparative study of the monitoring of the budgetary performance of the budget organization, the research to determine the impact of the implementation of the monitoring function and the factors affecting it, from the interrelated researches of monitoring and evaluation, the issues of monitoring functions, budget reform, and planning were studied. The lack of optimal planning of monitoring criteria for the effective implementation of the budget reform policy has become a pressing issue. Due to the absence of an internal unit with the function of monitoring and evaluation of the education sector, the "Results" of the implementation of policies and activities are evaluated, mistakes are detected in policy decisions, and employees only receive reports and report to the higher level, and monitoring and evaluation are done only once. Researchers conclude that there are still problems such as not understanding the importance of monitoring and control [Academy of Management, 2017, p. 115]. An overview of the evaluation of the organization's financial, accounting, and internal control systems through research work, problems discovered during the audit, solutions provided, explanations and clarifications about uncorrected immaterial errors, implementation of recommendations given in previous audits, explanations and clarifications about the results, audited financial reports, summarizing the form and basis of budget performance and audit opinion. Within the scope of the research, 7.4 billion MNT accidental errors were found in 30 institutions of pre-school education and 15 institutions of general education based on financial statements documented in compliance with international auditing standards and other generally accepted principles. The research work is aimed at identifying the factors affecting the above errors and making recommendations to raise the risk matrix assessment to the level of $R \leq 1-3$.

Keywords: *Standard, assumption, environmental analysis, review,*

1. Introduction

As part of the budget reforms, policies and legal regulations have been reformed, and the employees of the financial department of general education schools and preschools are using methods to evaluate whether they have achieved optimal financial planning and results-based planning, but the effectiveness of monitoring and evaluation is low. Monitoring and evaluation issues are not considered at the planning stage. There is still a problem of not optimally planning the monitoring criteria for the effective implementation of the budget reform policy. During the audit, the audit planning, execution, and reporting phases mentioned in the Financial Audit Procedures and Manual approved by the Auditor General of Mongolia were carried

out and documented, and the standards and principles followed in the audit, Article 15.15.1, Article 18.2 of the Law on Public Audit, and Budget 8.9.5 of Article 8 of the Law, the laws on budget, state audit, accounting and other related laws and regulations, international audit standards and other generally accepted principles have been carried out in accordance with the plans and programs developed at the planning stage.

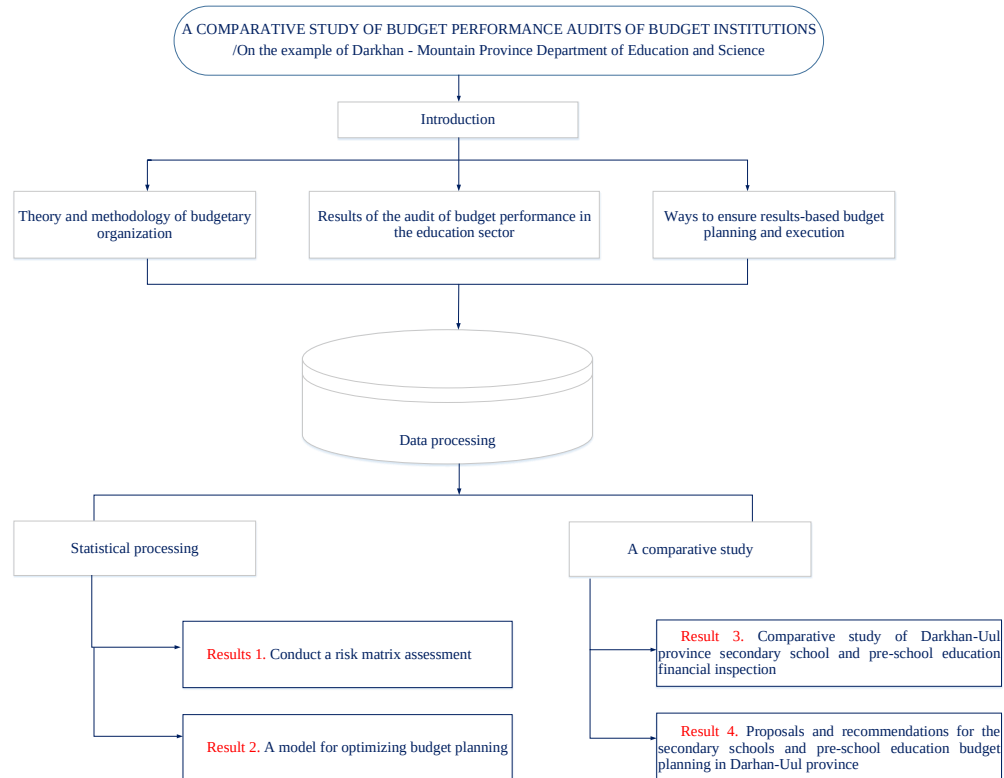
Practical significance of research work

The state-owned educational institution shall implement the relevant laws and standards of accounting, maintain financial discipline, be free from the factors affecting the errors and violations found in the audit, study at the workplace, and not repeat the violations, fraud, and improper activities. prevent accidents, protect the property of the organization, and work to ensure efficiency. It is of practical importance to study and introduce new knowledge and experience aimed at improving the inspection system, to communicate with foreign countries and international organizations, to carry out inspections and evaluations by professional non-governmental organizations, and to improve the capabilities of employees.

Research goals and objectives

It is to study the possibility of reducing the inconsistencies revealed by the audit of financial statements in the education sector of Darkhan-Uul province and make suggestions.

1. Conduct theoretical and methodological research;
2. Investigate the factors affecting the errors and violations found in the control analysis (audit) and determine the causes;
3. Based on the results of the research, develop recommendations and opportunities to reduce risks that may arise in the future.



/Source: Researcher's development

[Figure 1] Methodology and outline of the research work

Researcher Bill Scales [1997] Performance Monitoring, Armstrong [2006] One Stage of the Management Process–Monitoring, Josep Volu and Harry Khatri Stakeholder Participation and Competence in Monitoring and Continuous Improvement of Monitoring and Evaluation Systems that effort is important, Otieno [Otieno, 1999] about 6 characteristics of a well-implemented monitoring function or a “good” monitoring system, Jozoll Cusek, Ray C. Rist [2004]. “10 steps to developing a results-based monitoring and evaluation system” Evan Green and Dorothy Lax developed a methodology for conducting a national evaluation system and a capacity overview to assess the implementation of the Sustainable Development Goals /Malaysia, Philippines/, Ojok and Basheka conducted a study on the role of public sector monitoring and evaluation in promoting good governance using the case of developing African countries. Researchers Cool and Van Buuren [2004] studied in detail the functions of monitoring in public institutions and specifically defined "Monitoring" as separate from the function of "Evaluation".

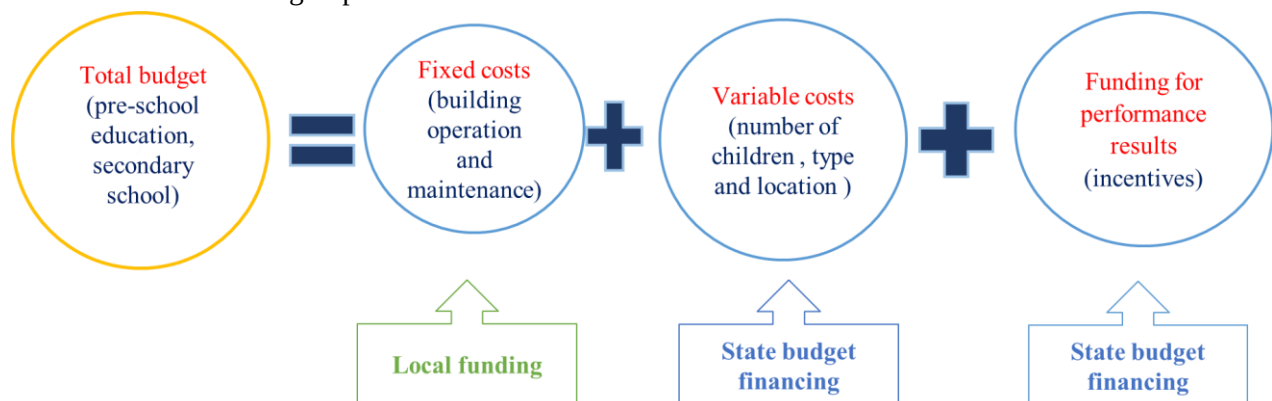
The review includes:

- Systematic activity,
- Iterative activity,
- Focuses on relevant policy progress,
- The results of the monitoring work become an explanation of the situation, monitoring has four main functions (Warning, Orientation, Communication, Learning) was considered to be implemented, and it was used in research.

2.1 Budget reforms in the education sector of Mongolia

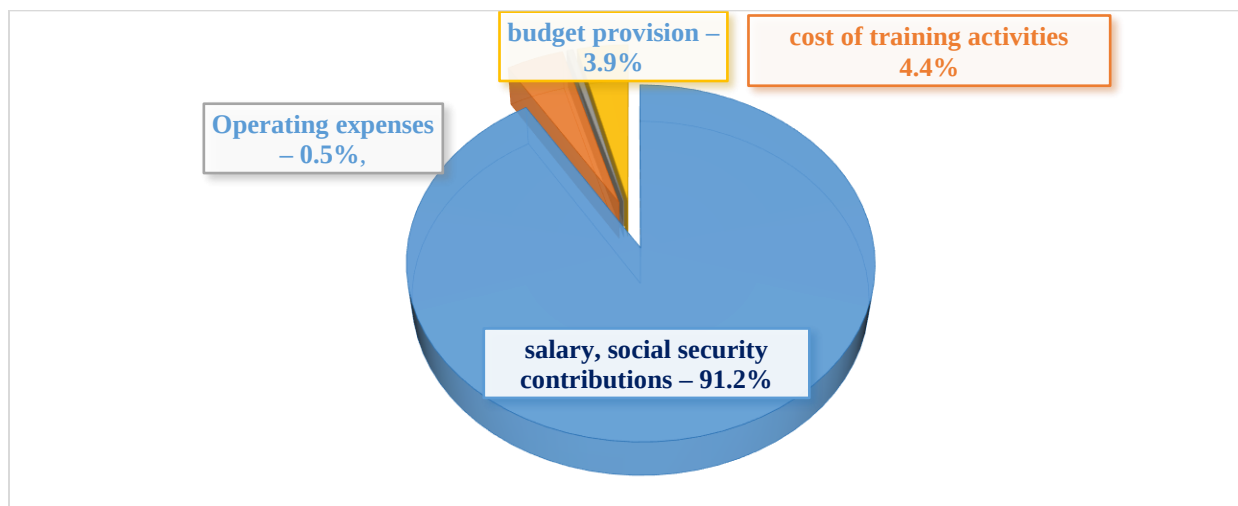
The Government of Mongolia is implementing budget reforms in the state budget in stages. The Ministry of Education and Science will transfer budget reforms aimed at education and science results from performance and product-based funding to result-oriented funding starting from 2022. A total of 1399 kindergarten and general education institutions, Education and Science It was started by two special funds of the Minister of Science's portfolio, the Education Loan Fund and the Science and Technology Fund. 14 percent of Mongolia's budget and 81 percent of the portfolio of the Education and Science Budget portfolio will be included in result-oriented budget reforms.

The budget structure of the education sector consists of local and state budget funding. The local budget includes fixed costs or maintenance costs related to the use of the building. Variable costs depend on the number, type and location of children. It is shown in [Figure 2] that the cost of performance incentives is included in the financing of performance results.



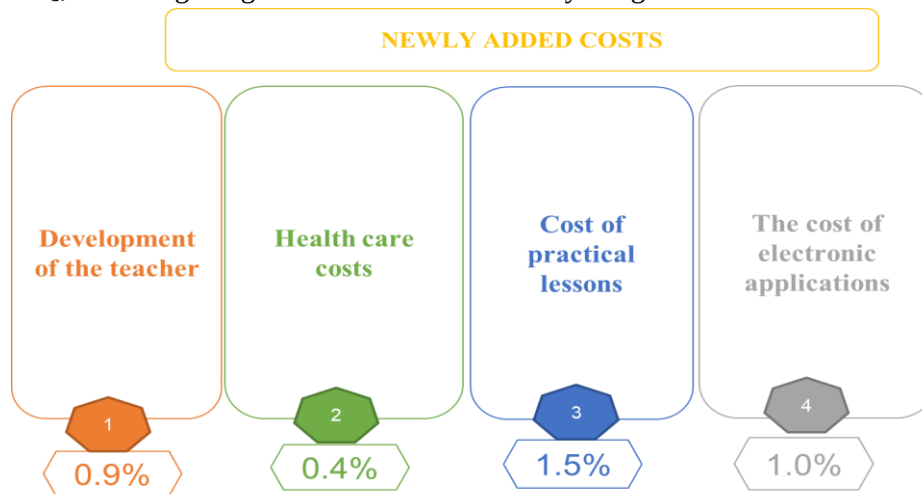
[Figure 2] Budget financing

The implementation of the budget reform is being implemented in stages, and we are working to transfer the education sector to a result-based financing system within 5 years. The organization's budget varies depending on the location and type of variable costs per pupil of state and local kindergartens and general education schools, and the coefficient of growth depending on the number of children. The share of financing costs provided by variable costs is shown [Figure 3].



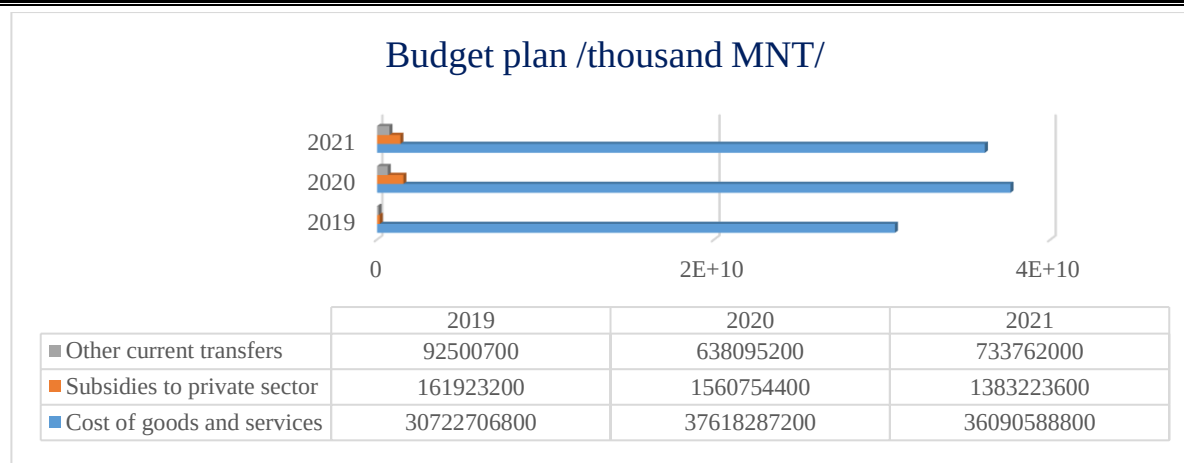
[Figure 3] Percentage of variable costs

According to the results of the research, 91% of the total variable costs are salaries, additional fees, social security contributions from the employer, 4% of training costs, and 1% of maintenance costs. As shown in [Figure 4], following budget reforms have been newly budgeted for teachers.



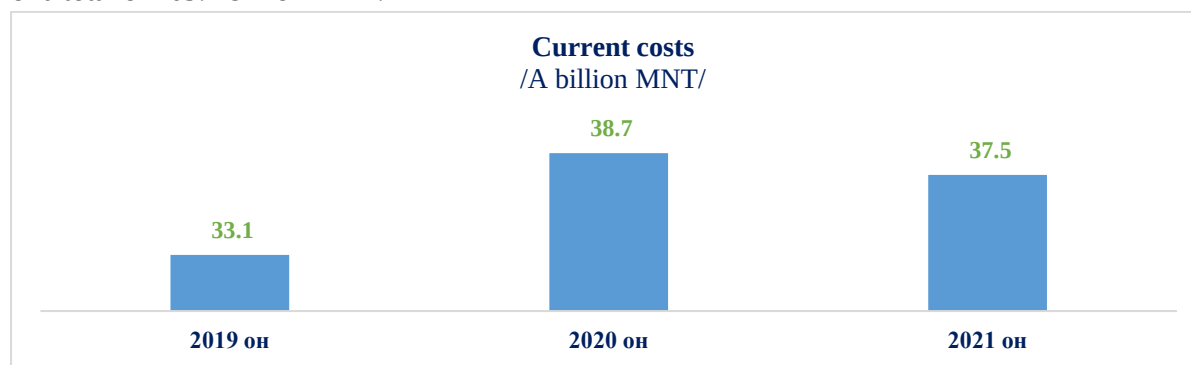
[Figure 4] The structure of increased expenses within the budget reforms

In Darkhan-Uul province, the 2019-2021 budget plan for the education sector is 111.3 billion, and its implementation is 109.4 billion MNT, or 98.2%. The 2020 budget plan has an increase of 6.5 billion MNT from the previous year and 1.6 billion MNT from 2021, which is the highest plan in the last 3 years [Table 5].



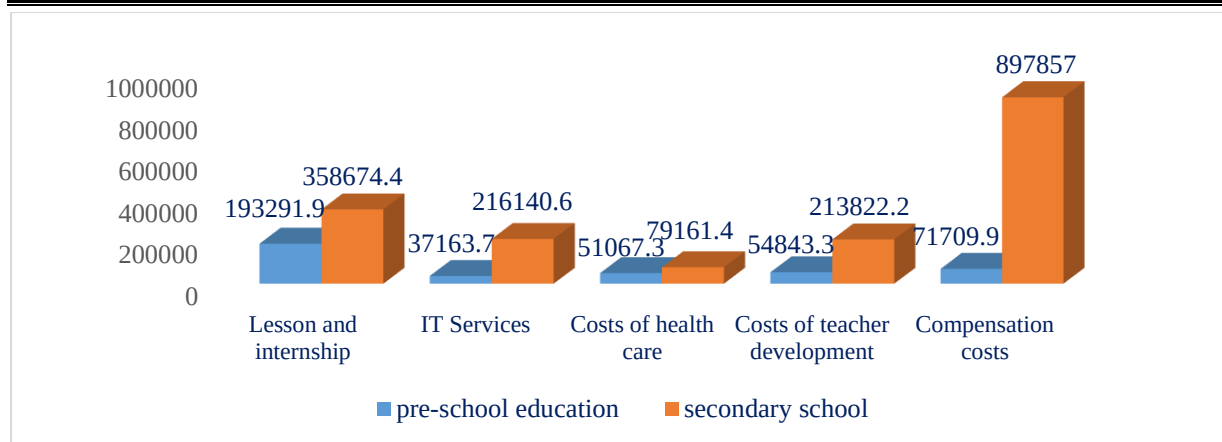
[Figure 5] Comparison of budget planning

The budget plan budgeted 104.4 billion MNT for the cost of goods and services, 4.5 billion MNT for subsidies to private sector organizations, and 2.2 billion MNT for other current transfers or benefits and incentives provided by the government to citizens. The budget performance is 102.8 billion MNT for goods and services, 4.4 billion MNT for private sector subsidies, and 2.1 billion MNT for other current transfers, or a total of 109.4 billion MNT.



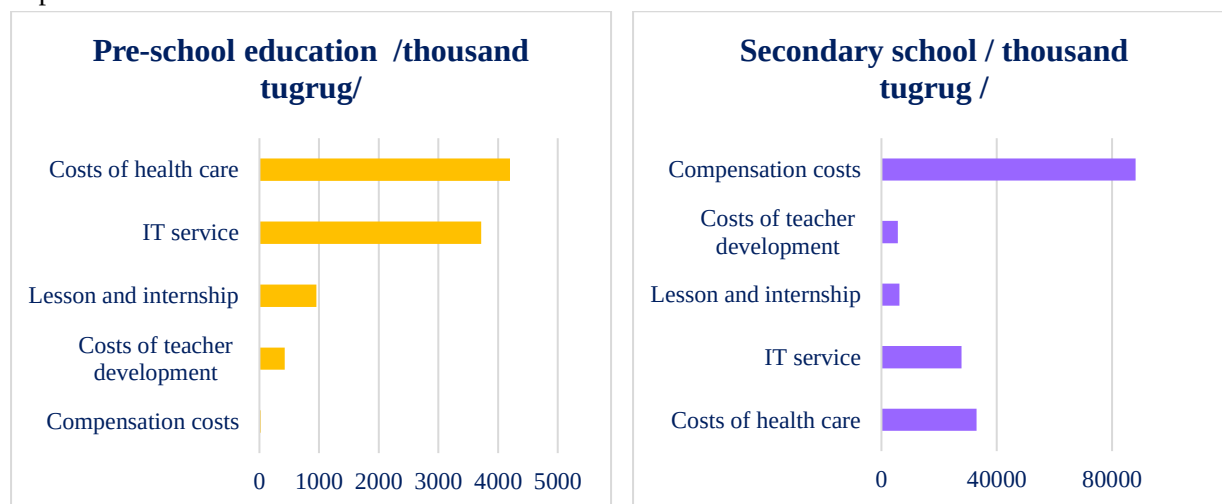
[Figure 6] Total cost of educational institutions

Wages and additional incentives, 79.3 percent of the total cost of social security provided by the employer, 6.8 percent of fixed costs related to the use of the building, 0.6 percent of supplies and inventory, 5.7 percent of standard costs, 1.3 percent of equipment and maintenance costs, appointments, Guest expenses accounted for 0.02 percent, fees and charges for work and services performed by others 0.19 percent, other expenses for goods and services 0.34 percent, subsidies to private sector organizations 4.8 percent, and other current transfers accounted for 1.9 percent. In 2022, the education sector started budget reform and implemented performance- and result-based financing, according to the 46.6 billion MNT plan, 44.5 billion MNT or 95.4 percent was completed. Also, in 2022, a total of 1.3 billion MNT was saved, and the cost of wages, additional incentives, social insurance contributions from the employer was 984.1 million MNT, lunch 177.6 million MNT, information technology costs 27.7 million MNT, dormitory food 55.8 million MNT, health care costs 33 million MNT, compensation costs 88.1 million MNT, the remaining expenses are training activities and normal operation costs 28.7 million MNT saved.



[Figure 7] Implementation of newly planned expenses /in thousands of MNT/

As part of the budget reforms, the above costs have been increased with performance and results-based financing, and the performance of the 2022 budget has been shown. Showing the unspent balance of these expenses:

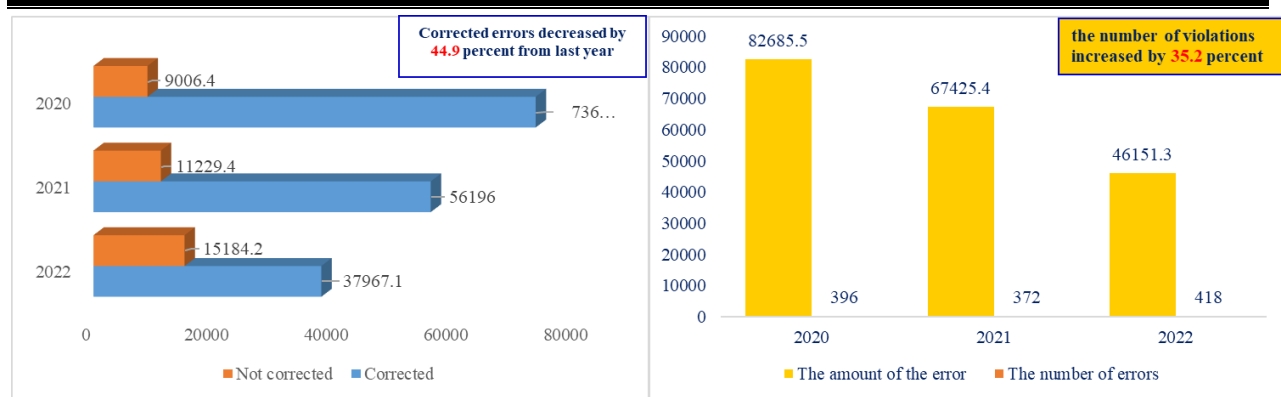


[Figure 8] Unspent balance of budgeted expenses

From the above study, it can be seen that compensation costs were allocated for the creation of a child-friendly learning environment, and 88.1 million MNT was saved and transferred to spend in 2023 due to the situation where the ordered goods could not be delivered.

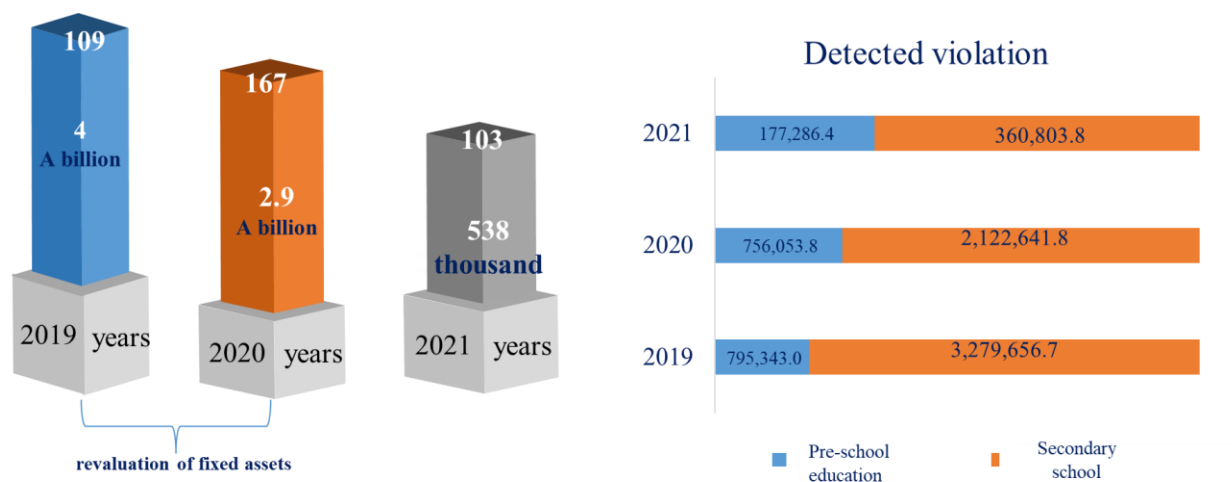
2.2. The results of the analysis and inspection of the financial statements of Darkhan-Mountain educational institutions

In 2021, the State Audit Office of Darkhan-Uul Province audited the financial statements of a total of 107 locally-owned and locally-owned enterprises and found the following errors and violations. Of these, 91 organizations are locally-owned organizations, 16 organizations are local-owned enterprises, 1 organization has taken measures to hold them accountable, 47 payment acts have been established, 119 errors and violations have been corrected, 27 official requirements and 130 recommendations have been submitted. research proves. A comparison of detected errors and violations in the last 3 years:



[Figure 9] Errors and violations found during inspection

According to the results of the above research, it is observed that the number of violations has increased by 44.9% compared to previous years. By following the accounting standards, the financial statements are presented accurately and realistically (Accounting Law, Budget Law, International Public Sector Accounting Standards (IPSAS), resolutions). 15 general education schools, 30 pre-school educational institutions, or a total of 45 state-owned institutions, were included in the research, and as of the last 3 years, a total of 7.4 billion MNT errors and violations were found.



Source: Prepared by the researcher

[Figure 10] Errors and violations found in the researched organizations

As a result of the above research, a total of 7.4 billion MNT errors and violations were detected, and it is observed that there were 4 billion MNT violations in 2019, 2.9 billion MNT violations in 2020, and 538 million MNT violations in 2021. It is observed that the reasons for these errors and violations are as follows. It includes:

1. The amount registered in the state registration certificate of the organization was found to be 2.8 billion MNT different from the amount reflected in the 2019 financial report.
2. It is proven that the errors related to the revaluation of fixed assets and its registration amount to 2.6 billion MNT in 2019-2021 due to non-compliance with International Public Sector Accounting Standards (IPSAS) 17.

3. In the last 3 years, errors related to accounting reporting amounted to 1.5 billion MNT, errors related to inventory and fixed assets amounted to 950.0 million MNT, errors related to income and expenditure registration amounted to 552.7 million MNT, and errors related to accounts payable and receivable accounted for 74.1 million MNT.
4. Mistakes in salary calculation amount to MNT 146.1 million;
5. 189.1 million MNT for errors related to the reporting of the bank account;
6. The research shows that 107.5 million MNT were violated without primary documents and the relevant laws and regulations were violated.

It is shown in [Table 1] that 77 percent of total errors and violations are in general education schools and 23 percent in pre-school education institutions.

[Table 1] Corrected and uncorrected errors

Errors and violations	Preschool education	Secondary school	Total
Correction	1231343.6	599803.5	1831147.1
Advice	458837.2	5001547.7	5460384.9
Official requirements	26805.7	144863.2	171668.9
Payment deed	11696.7	16887.9	28584.6
Total	1728683.2	5763102.3	7491785.5

Source: Prepared by researcher

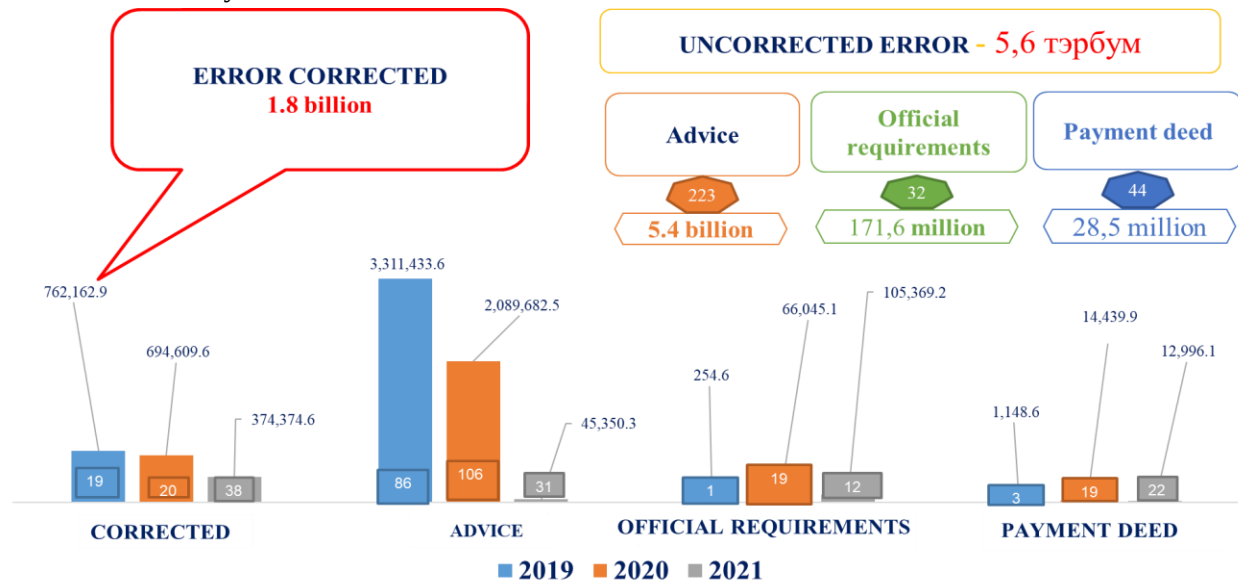
Fixed Financial Report Audit 24.3 Percent 24.3 Percent, Tips, Tips, Tips 72.9 percent 72.9 percent, Official Reference to 2.3% Corrected error means corrections and reports related to accounts and reports of accounts related to accounts in accounts and reports of the financial statements. An uncorrected error refers to a recommendation, formal request, or issuance of a payment deed for an uncorrectable error that has already occurred. According to international audit standards, relevant laws and standards are not implemented, norms and standards are not followed, property is missing, embezzled, improperly prepared and used, and income and expenses are under-recorded intentionally or unintentionally. It can be seen from an international study [Figure 11] that the country is held harmless by paying the guilty party.

Official requirements 171.6 million	Laws and standards Records were not maintained in accordance with accounting laws and standards	Property Improper preparation and use of funds	Income and expenditure Budget funds were spent inefficiently	• Salary-59.8 million • Reporting-11.6 million • Class account-100.2 million
	Norms and standards If the norms and the competent organization are exceeded	Property Undercapitalized, gratuitously transferred, embezzled, and personally used	Income and expenditure 1. Real damage has been caused by the calculation of salary and incentives 2. Revenue was under-collected	
PAYMENT DEED 28.5 million				• Salary • Rewards and Incentives • Deduction fired
ADVICE 5.4 billion	Re-evaluation 36 organizations 2.3 billion	Register and report 256 million	Glass account 43 organizations 88.8 million	Accounting policies 6 organizations

Source: Prepared by researcher

[Figure 11]. Structure of uncorrected errors

In accordance with the requirements of truthful reporting of financial statements, 1.8 billion MNT errors and violations have been corrected and transparently reported in the last 3 years, which has created conditions for providing accurate information to users. Figure 22 below shows the number and amount of violations for each year.



Source: Prepared by the researcher

[Figure 12]. The structure of detected errors and violations

The guidelines for the accounting structure account state that International Public Sector Accounting Standards (IPSAS) 17 "Fixed Assets" shall be followed for the recognition of fixed assets, their book value, and determination of depreciation and revaluation. Therefore, [Table 2] shows that the above-mentioned violations did not revalue fixed assets with no residual value, wrongly reported the valued assets in the financial statement, and the difference between the amount reflected in the state registration certificate of the organization and the financial statement was the main reason for the high number of errors and violations detected in 2019-2020.

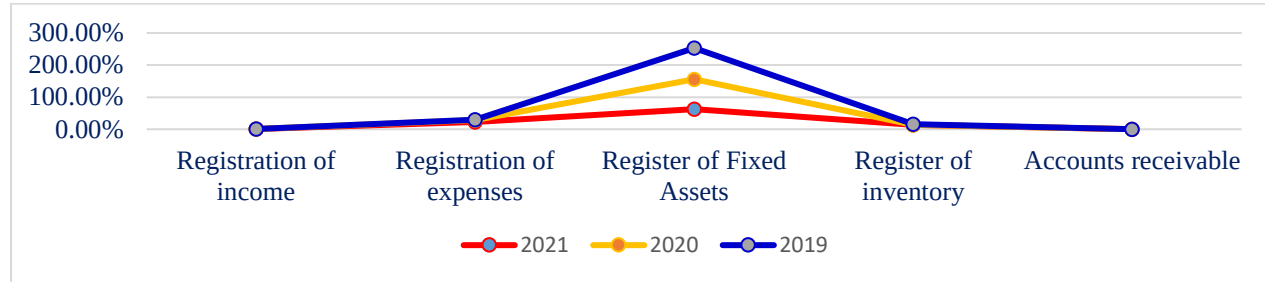
[Table 2] Categories of detected violations

№	Type of violation	Tugrug
1	Register and report	4.4 billion
2	Salary	146.1 million
3	Primary facts	107.6 million
4	Glass account	189.1 million
5	Fixed assets (Revaluation and registration)	2.6 billion
6	Accounting policy document	

Source: Prepared by the researcher

In the course of the research, 58.4 percent of the errors were related to accounting reporting, 2.5 percent were related to the transparency of glass accounts, and 35.1 percent were related to fixed asset accounting reporting. In addition, 1.4 percent lack of basic documents, and 2.6 percent were discovered errors and violations related to salary calculation and payment. Also, violations such as lack of documentation of accounting policies and non-compliance were reported. The research confirms that these errors violated the

accounting law, budget law, glass account law, and International Public Sector Accounting Standards (IPSAS) 1, 12, 17, and 30, respectively.



Source: Prepared by researcher

[Figure 13]. Audit adjustments

In the last 3 years, the errors such as not accurately reflecting accounts receivable, inventory and fixed assets classification and revaluation and not reflected in the financial statements, incorrect depreciation calculations, incorrect state registration certificates, and incomplete accounting of income and expenses have been corrected. A risk matrix was assessed for the above errors and violations based on the International Auditing Standard-300 and International Auditing Standard-230 criteria [Table 3].

[Table 3] Risk matrix assessment

№	Factors	Assessment of risk		Classification	Level of risk
		Secondary school	Preschool education		
1	Reporting	A	A	B	R=51-90
2	Account registration	C	B	C	R=11-50
3	Salary	A	A	D	R=4-10
4	Primary facts	B	D	E	R=1-3
Ховор		Happens occasionally	It is possible	Calculate	Always
Less		1	No immediate control measures are required		
Medium		5	Hazards need to be controlled and action is required		
much		10	It is necessary to take immediate measures and eliminate the risk		

Source: Prepared by researcher

This evaluation shows that there is a high risk of errors and violations in the reporting and payment of wages and salaries in general education schools and kindergartens, so there is a need to pay attention to budget reform in the education sector and implement efficient, performance-based financing.

[Table 4]. SWOT analysis

Strengths		Weakness	
S1	Eliminate costs incurred by teachers	W1	Necessary equipment cannot be purchased
S2	Increase access to learning materials for every child	W2	Lack of essential materials
S3	Early detection of disease	W3	Due to insufficient budget, data consumption cannot be fully met
S4	Continuous development of the teacher at the workplace	W4	Lack of test results and guidance
S5	Provide incentives for performance	W5	Module courses overlap with class time and create an inefficient workload
Opportunities		Threats	
O1	Resolutions and decisions can be changed.	T1	To develop the underground economy

O2	Carry out detailed professional examination, diagnosis and treatment	T2	Increase in inefficient costs
O3	Plan and finance the budget realistically	T3	Disruption of financial discipline
O4	Provide empowerment training and achieve specific results	T4	Increase in financial violations due to lack of legal education on budget reforms
O5	Include public service employee wages, social security contributions, and transportation expenses as variable expenses	T5	Increasing the mentality of cashing

[Table 5]. Evaluation of experts in SWOT analysis

S	Assessment					Grade	W	Assessment					Grade
	n1	n2	n3	n4	n5			n1	n2	n3	n4	n5	
S1	4	4	5	5	3	21	W1	5	5	5	5	5	25
S2	5	5	4	4	4	22	W2	5	5	4	5	5	24
S3	3	5	3	4	5	20	W3	5	5	3	5	4	22
S4	4	3	5	3	5	20	W4	4	5	5	4	3	21
S5	5	5	5	4	3	22	W5	4	5	4	4	3	20
O	Assessment					Grade	T	Assessment					Grade
O1	3	4	5	4	5			5	4	5	4	5	
O2	5	5	5	3	3	21	T2	4	4	5	5	5	23
O3	5	4	5	4	5	23	T3	5	3	5	3	5	21
O4	5	5	5	5	4	24	T4	5	5	5	4	5	24
O5	5	4	5	4	5	23	T5	4	5	5	5	5	24

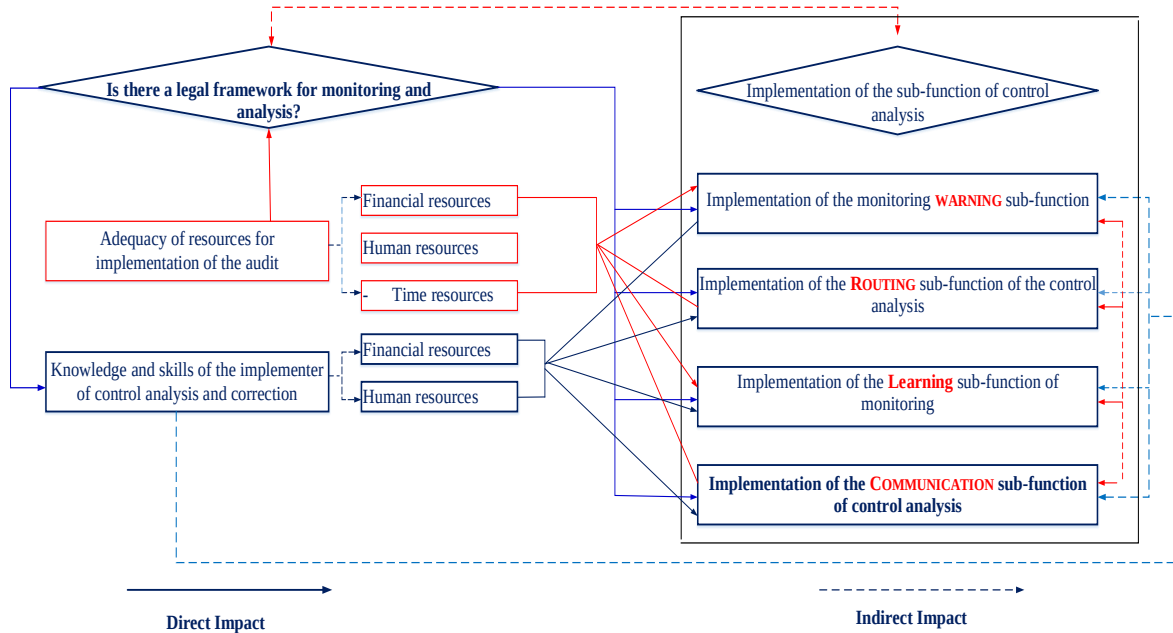
Source: Prepared by researcher

[Table 6]. *TOWS matrix*

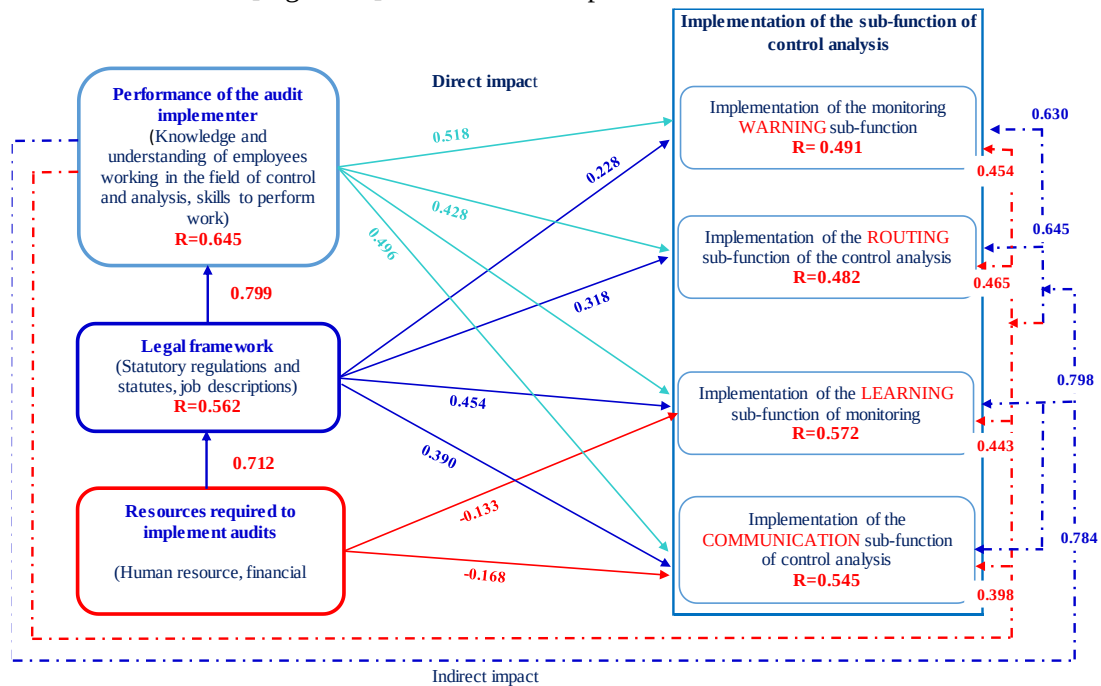
Strengths	Point	Weakness	Point
S1	21	W1	25
S2	22	W2	24
S3	20	W3	22
S4	20	W4	21
S5	22	W5	20
Opportunities	point	SO-STRATEGIES	WO-STRATEGIES
O1	21	As part of the budget reform, teachers will continuously develop in the workplace and increase the competitiveness of the education sector.	Increase the provision of equipment necessary for realistic budget planning by increasing the legal concepts of budget reform.
O2	21		
O3	23		
O4	24		
O5	23		
Threats	point	ST-STRATEGIES	WT-STRATEGIES
T1	23	Optimizing performance-based budget planning by improving the implementation of legal and budget reforms.	Improving the legal knowledge of accountants of preschool and secondary schools in the field of education to prevent accidental mistakes and accurately present financial statements.
T2	23		
T3	21		
T4	24		
T5	24		

Source: Prepared by researcher

3.1 of the Variable Costing Methodology states that running costs are adequate, which is missing from the above costs. There is a need to use a methodology to evaluate whether the results have been achieved as planned and to plan the activities of budget institutions and accountants through the reform of policies and legal regulations to introduce result-based management implemented as one of the areas of budget reform in the education sector. Based on results-based supervision theory and research findings on the sub-functions of supervision, the research will be carried out with the following conceptual framework. The conceptual framework of the study and the problem to be studied are illustrated. [Figure 14].



Source: Developed and compiled based on the review of research and comparison of research methods. [Figure 14]. Research Conceptual Framework



Source: Based on the results of the research, the implementation of the monitoring function was mapped.

[Figure 15]. According to the results of the study, the implementation of the sub-functions of monitoring and analysis, which is reflected in Model 3

Based on the results of the above research, a mixed research combining descriptive research and explanatory research was carried out. The interview method was also used in the study to confirm the findings of the quantitative research. In order to determine the relationship between relevant and non-relevant variables by quantitative analysis, two hypotheses were put forward and tested based on previous studies, reports, and preliminary research to identify the problem. The model used in the research is a method of analysis that not only calculates the direct relationship between relevant and non-relevant variables, but also calculates indirect effects, and even calculates the correlation between the factors selected as variables regardless of changing the design of the model considering the weak correlation. According to the results of the revised and calculated model, the legal framework has the strongest impact on the performance of the supervisor or the knowledge, skills, and work performance of the supervisor. This means that a well-formed legal framework directly affects the performance of the supervisor and thus becomes a basic condition for improving the implementation of the supervision function of the local administrative organization. Therefore, the results of our research prove that there is a possibility to improve the results of monitoring if monitoring instructions and procedures are developed and implemented within the framework of common procedures and instructions approved by the government.

Conclusion

In order to determine the relationship between the variables defined in the framework of the research concept and its strength, a structural equation model commonly used in international social science research was selected and used.

1. During the risk assessment of 7.4 billion MNT errors and violations of 45 institutions audited in the last 3 years, it was proved that 1.7 billion MNT violations in 30 pre-school education and 5.7 billion MNT violations in 15 secondary school are high risks.
2. According to the research, 95.9 percent of the violations occurred in the process of registration and reporting are due to factors such as the professional skills of financial and accounting staff, weak attitude to work, and lack of information about reforms.
3. According to the results of the research, the level of implementation of the sub-functions of directing and communicating was evaluated with 3.76-3.78 points and it was concluded that it is well implemented. However, it was concluded that the implementation of warning and learning sub-functions is implemented at an average level. Therefore, in order to improve the discipline of financial operations in the education sector, it is confirmed by the results of the research that it is necessary to effectively and uniformly implement the 4 sub-functions of supervision.
4. In terms of the 4 sub-functions of supervision considered in the study, it was concluded that the performance of the supervisor has a strong impact on the implementation of the sub-functions of warning, guidance, and learning, and also has a high impact on the implementation of the sub-function of communicating.
5. It has been proven that the resources required for the implementation of monitoring and analysis have a strong correlation of 0.722 with the implementation of the monitoring functions through the factors of the legal environment.

6. The audit function aims to create a form of trust and cooperation through the implementation of a sub-function that acts as a bridge between accountants and administrators (higher and lower level) in the education sector, but this is not always implemented. Therefore, it is proved by the results of the study that it is necessary to pay attention to the cooperation and participation of the stakeholders by implementing the communication and learning sub-functions of monitoring and sharing the actual information of the monitoring results to get a common understanding of the issues covered by the monitoring.
7. The research showed that there is a need to make the management and staff understand the importance of the monitoring function, as it provides the opportunity to reduce the risks during the implementation process and to generate the key information necessary for the effective implementation of the evaluation. If the monitoring and analysis function is considered comprehensively, it will detect uncertain and risky situations without delay (warning function), provide opportunities for sharing and exchanging information with each other, and continuous learning (learning) and communicate with the same level of understanding and information, also it has the greatest influence on the development of cooperation (communicative functions)
8. The results of the research confirmed that there is a need to improve the skills of analyzing and evaluating information to provide integrated methods and methodologies in order to improve the implementation of the financial control functions of the education sector.

Suggestions and recommendations

Studying the implementation of the function of financial supervision of the education sector, the following proposals and recommendations are made for the planning of the budget reform.

1. Increase the budget of other costs of goods and services to ensure normal training activities by 1.2 percent.
2. Increase financial discipline and work responsibility.
3. Regular participation in human resource capacity building training.
4. It is advisable to carry out a study on the implementation of the financial control function of the education sector at the level of the education sector of Darkhan-Uul province and evaluate the implementation of the 4 sub-functions of control. Therefore, it is considered important to conduct a study to determine the sub-functions of monitoring and the factors affecting them using a unified methodology at regular intervals, and compare the changes and use the results for management decision-making and policy development.
5. The most influential factors in the implementation of the supervisory function in the education sector are the performance of the supervisory staff, or the staff's knowledge, skills, and work performance. Therefore, it is necessary to constantly improve the skills of accountants, especially to improve the skills of conducting research and analysis, determining the causes, analyzing and summarizing problems and providing information to stakeholders.
6. Research has confirmed that the factor with medium strong influence on the implementation of the control and analysis function is the legal environment factor. In addition, the legal environment factor had the strongest impact on the implementation of learning sub-functions. Also, according to the results of document analysis, the regulation supporting sub-functions is insufficient. Therefore, it will be effective if future legal acts include provisions and regulations that support the process of learning and warning before the same problem is repeated.

7. Regardless of the variables, the least influential factor in the implementation of the monitoring function is the adequacy of the resources (necessary manpower, financial and time resources) required for the implementation of monitoring.

When the impact was analyzed in detail, the resources required to implement financial controls were assessed as having the least impact on the learning and communication sub-functions.

This means that even when there are not enough resources for the implementation of monitoring, the financial staff of the educational institution can learn from each other from the monitoring process, the work performed, reports, recommendations, and communicate the results, achievements, shortcomings, and issues to be considered.

8. Among the factors defined as resources, the availability of financial resources is the most influential, but the participants of the survey mentioned it during the questionnaire survey and interviews. Due to the fact that the costs and funding of monitoring and evaluation in the education sector are not specifically determined, it is often difficult to obtain the funds necessary for researching and introducing new knowledge and experience aimed at improving the monitoring system, communicating with foreign countries and international organizations, performing monitoring and evaluation by professional non-governmental organizations, and improving the capabilities of employees. In order to eliminate this problem, it is necessary to re-budget the financing of the salaries, social insurance contributions, incentives, and food expenses of employees of the 1st-3rd levels of supervision and public services as part of variable expenses.

References

- [1] Удирдлагын Академи, (2017), “Менежмент” сурах бичиг. Улаанбаатар.
- [2] Ш.Батсүх, (2017), “Үр нөлөө бүхий нутгийн удирдлагын тогтолцоо бүрдүүлэх арга зам: туршлага, сургамж, шийдэл”
- [3] К. А. Сан-Д, “Үр нөлөө бүхий удирдлагын тогтолцоо”, (хуудсд. 5-15). Улаанбаатар.
- [4] Ш.Батсүх, (2009), “Улсын салбарын шинэ удирдлага”, Улаанбаатар: Удирдлагын академи.
- [5] К. А. Сан-Д, “Үр нөлөө бүхий удирдлагын тогтолцоо”, (хуудсд. 5-15). Улаанбаатар.
- [5] Б.Баясгалан, (2010). Төсвийн удирдлага: Шинэчлэл, хандлага. Улаанбаатар: Мөнхийн үсэг.
- [6] Д.Ганбаатар, (2002), “Байгууллагын хөгжлийн удирдлагын асуудал”, Улаанбаатар. (диссертаци, Проблема управления развитием организаций, Автореферат, Удирдахуйн ухааны боловсролын докторын зэрэг). Улаанбаатар.
- [7] Д.Ганбаатар, Я.Шуурав, & Д.Сэржамц, (2017). “Менежмент”, Улаанбаатар: Амарпресс. Дэлхийн банк. (2009). Монгол улс ололтуудыг бататган, өсөлт ба уналтыг удирдаж, үйлчилгээг илүү сайн хүргэх нь : Төсвийн зардал, санхүүгийн удирдлагын тойм судалаа. Дэлхийн банк.
- [8] ЖоЗолл Кусек, Рей С.Рист. (2004). Үр дүнд суурилсан хяналт-шинжилгээ, үнэлгээний тогтолцоог хөгжүүлэх 10 алхам.
- [9] Засгийн газар. (2018). Чиг үүрэг дахин хуваарилах аргачлал. Улаанбаатар. Засгийн газрын 89 дүгээр тогтоол. (2017). Бодлогын баримт бичгийн хэрэгжилт, захиргааны байгууллагын үйл ажиллагаанд хяналт-шинжилгээ, үнэлгээ хийх нийтлэг журам.
- [10] Монгол улсын ЗГХЭГ. (2004). Төрийн захиргааны байгууллагын хяналт-шинжилгээ, үнэлгээ. Улаанбаатар: ЗГ-ын хэвлэх. НҮБ, АХБ. (2018). Монгол улсын Тогтвортой хөгжлийн зорилгуудын хэрэгжилтийг эрчимжүүлэх талаар бодлогын зөвлөгөө өгөх. UNDP Publishing.
- [11] Л.Отгонтуяа, (2008), “Төсвийн зарлагын төлөвлөлтийг боловсронгуй болгох онол, арга зүйн асуудал”, Удирдахуйн онол, практикийн асуудлууд №7.
- [12] В.Өлзийбаяр, (2008). “Төрийн албаны манлайллын өөрчлөлт”. Улаанбаатар. СЯ, НҮБХХ, Ядуурал, байгаль орчны санаачилга хөтөлбөр. (2016). "Монгол Улсын Хөгжлийн бодлого, төлөвлөлтийн тогтолцоог бэхжүүлэх" төсөл: Хэрэгжилтийн тайлан. 2013-2016. Улаанбаатар.
- [13] Төрийн албаны зөвлөл. (2019 оны 09 01). <http://www.csc.gov.mn/s/47/377>. <http://www.csc.gov.mn>: <http://www.csc.gov.mn/s/47/377-ээс> Гаргасан

SSBA-42

Study of the possibility of introducing an integrated compliance system in a mining company

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Abstract: Business responsibility and ethical trends are inextricably linked with economic development, social and environmental changes. However, due to the situation of the COVID-19 pandemic, the activities and services of the public and private sectors have lost their electronic weight, and e-commerce, which was equal to 14% of the world's GDP in 2019, will be 34% at the end of 2021, and public services will be 12% on average for countries. It is observed from international studies that the increase in ethical trends is taking place. Along with the evolution of the coronavirus, electronic viruses have evolved, and 93.6% of the 2019 cyber attack viruses are polymorphic, or able to change their code to escape detection. Organizations have created conditions for 32% of their employees to work online in order to save costs and time and increase work efficiency. However, it is observed from international research that 55% of the results of work have decreased [8]. Therefore, in the research, the attitude of business owners and civil servants of Mongolia is studied, and in the future, how to coordinate with other management systems such as corruption, lack of information, and social responsibility, and how to develop a culture of compliance, a legitimate problem arises. Within the scope of the research work, the basic research of compliance implementation is divided into 4 groups, and the results are summarized, and the results of the appropriate environment for the implementation of ISO37301:2021 and how to coordinate the management system are presented [14].

Keywords: *Audit, Documented information, Opportunity, Nonconformity, Effectiveness*

1. Introduction

In Mongolia, the mining sector has been developing very rapidly in recent years; moreover, economic development is unimaginable without the mining sector, and it has been defined as the leading sector of our country's economy. According to the preliminary performance of 2019, the mining sector alone accounted for 25% of the GDP, and as of 2020, the number of valid mineral licenses in the mining sector is 2745. Though it has positive impact on economic development, it has negative impact on the environment. GRC is a unified system of tools that enable organizations to achieve their goals reliably, eliminate uncertainty, and operate with integrity. The main function of the compliance is to detect where and how laws, rules and regulations are breached, to prevent them, to reduce possible losses and damages to organizations due to violations of laws and regulations and support successful and non-stop business operations; meanwhile, it is necessary to identify the features that shape the culture of an organization. Research age groups: 10.9% aged up to 30 years old, 33.7% aged 31-40, 35.6% aged 41-50, and 19.8% aged 51+ years old. By gender:

55.6% are female and 44.4% are male. Number of employees: 33.7% have up to 5 employees, 7.9% up to 10 employees, 15.8% up to 20 employees, 19.8% up to 50 employees, 6.9% up to 100 employees, and 15.8% over 100 employees. Length of business in the sector: 9.9% for first year, 25.7% for up to 5 years, 19.8% for 6-10 years, 28.7% for 11-20 years, and 15.8% for over 20 years. Here, we present results of the research on how to improve and eliminate the 9 non-conformities identified in the 2019-2025 business plan of Erdenes Tavan Tolgoi JSC by introducing the integrated management planning standards.

Research goal:

To study the possibilities of introducing an integrated compliance management system, to identify the factors affecting the introduction of the ISO 37301:2018 standard, and to develop conclusions and recommendations. The following objectives were set within the framework of the research work. It includes:

1. Study the compliance theory and methodology, and international standards
2. Study about the mining sector and related laws and legislature
3. Study impacts of the mining sector on the environment and study about impact assessment methods
4. Conduct a survey among the businesses engaged in the mining sector to identify challenges for improving the compliance system
5. Develop recommendations on the ways to improve the compliance quality system

Research importance:

By introducing the ISO 37301:2021 standard in Mongolia, allocation of compliance budgets and resources is optimized, ensuring the implementation of laws, rules and regulations, shaping the culture of the organization, and maintaining ethics, as well as penetrating the company culture. Also, when an organization introduces a compliance management system, it will be appropriate to implement it in coordination with other management systems such as risk, anti-corruption, quality, information security, and social responsibility.

2. Survey Research

2.1 Previous studies:

The word company came into scientific use when Elizabeth I of England founded the Muscovy Company. The first Spine company was established in 1557. A company is an intangible entity that exists based on the law, and East India, a joint English and Dutch company, defined the independence of legal institutions and owners based on the law. In order to strengthen international corporate governance, the following educational activities were organized: anti-corruption trainings, anti-corruption campaigns, ethical control of company employees, procurement, supply chain, encourage partner companies to anti-corruption activities, identification of potential risks to company operations and measures to reduce them. In December 2021, the ISO 37301:2021 standard was approved internationally and in 2022, Erdenes Tavan Tolgoi JSC approved the implementation of the MNS ISO 37301:2022 standard.

3. Methods

The empiric study was conducted by dividing the questionnaire into 4 groups by age and number of employees and years of employment in the current business sector. The study results are presented here. GRC is a unified system of instruments that enables organizations to achieve their goals, eliminate uncertainty, operate with integrity.

Governance – It is the allocation of powers of the Board of Directors, management and shareholders. Today, this term is used to encompass multi-activities aimed at managing companies from top-level executives

Risk management - It is used in a variety of ways starting from simple risk assessments to entity's risk management processes.

Compliance – At first, it used to mean compliance with certain laws and legislature, but then, it also included internal regulations of a company.

Research age groups: 10.9% aged up to 30 years old, 33.7% aged 31-40, 35.6% aged 41-50, and 19.8% aged 51+ years old. By gender: 56% are female and 45% are male. Number of employees: 33.7% have up to 5 employees, 7.9% up to 10 employees, 15.8% up to 20 employees, 19.8% up to 50 employees, 6.9% up to 100 employees, and 15.8% over 100 employees. Length of business in the sector: 9.9% for first year, 25.7% for up to 5 years, 19.8% for 6-10 years, 28.7% for 11-20 years, and 15.8% for over 20 years. The research design was grouped into the following 4 main concepts and summarized by questionnaire method.

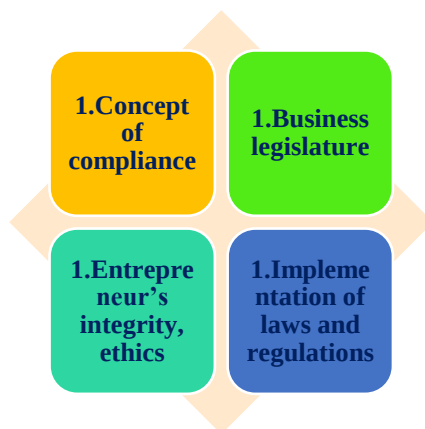
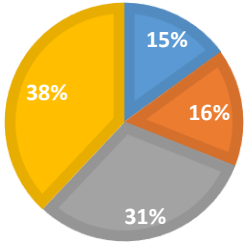


Figure 1. Research design

[Table 1] Level of awareness of compliance

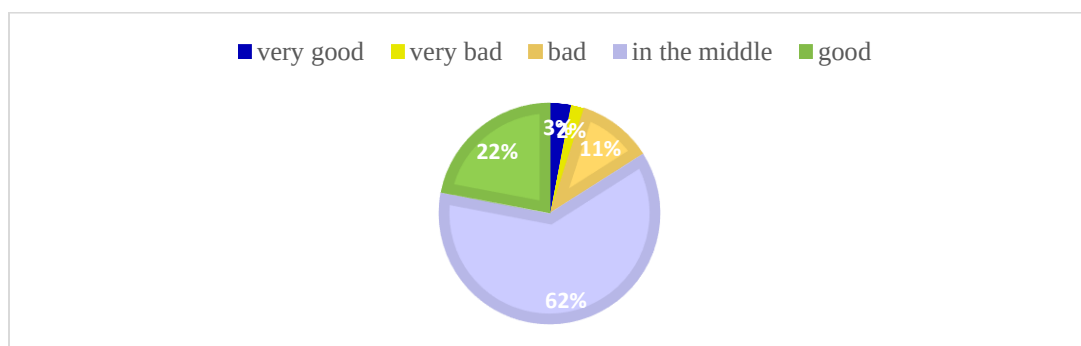
<i>Nº</i>	<i>Question</i>	<i>Results</i>										
1	What is level of awareness of compliance among entrepreneur?	■ Difficult to answer ■ I know ■ A little bit ■ Don't know <table><thead><tr><th>Response</th><th>Percentage</th></tr></thead><tbody><tr><td>Don't know</td><td>38%</td></tr><tr><td>A little bit</td><td>31%</td></tr><tr><td>I know</td><td>16%</td></tr><tr><td>Difficult to answer</td><td>15%</td></tr></tbody></table>	Response	Percentage	Don't know	38%	A little bit	31%	I know	16%	Difficult to answer	15%
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Don't know	38%											
A little bit	31%											
I know	16%											
Difficult to answer	15%											

2	How strongly does your organization follow laws, rules, regulations, and standards?	very good very bad bad in the middle good <table><tr><td>very good</td><td>24%</td></tr><tr><td>very bad</td><td>1%</td></tr><tr><td>bad</td><td>2%</td></tr><tr><td>in the middle</td><td>31%</td></tr><tr><td>good</td><td>42%</td></tr></table>	very good	24%	very bad	1%	bad	2%	in the middle	31%	good	42%
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bad	2%											
in the middle	31%											
good	42%											
3	Who does your organization rely on for assistance in complying with laws, rules, regulations, and standards?	Responsible for one employee Full-time staff <table><tr><td>Responsible for one employee</td><td>6%</td></tr><tr><td>Full-time staff</td><td>23%</td></tr><tr><td>Unlabeled</td><td>17%</td></tr><tr><td>Unlabeled</td><td>22%</td></tr><tr><td>Unlabeled</td><td>21%</td></tr></table>	Responsible for one employee	6%	Full-time staff	23%	Unlabeled	17%	Unlabeled	22%	Unlabeled	21%
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Full-time staff	23%											
Unlabeled	17%											
Unlabeled	22%											
Unlabeled	21%											
4	How clear are the rules, regulations, and standards of your sector?	Do not know well Understandably Some are obvious Incomprehensible <table><tr><td>Do not know well</td><td>8%</td></tr><tr><td>Understandably</td><td>25%</td></tr><tr><td>Some are obvious</td><td>57%</td></tr><tr><td>Incomprehensible</td><td>10%</td></tr></table>	Do not know well	8%	Understandably	25%	Some are obvious	57%	Incomprehensible	10%		
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Understandably	25%											
Some are obvious	57%											
Incomprehensible	10%											
5	How do you think entrepreneurs adhere to laws, regulations, and standards?	Do not know well Understandably Some are obvious Incomprehensible <table><tr><td>Do not know well</td><td>8%</td></tr><tr><td>Understandably</td><td>25%</td></tr><tr><td>Some are obvious</td><td>57%</td></tr><tr><td>Incomprehensible</td><td>10%</td></tr></table>	Do not know well	8%	Understandably	25%	Some are obvious	57%	Incomprehensible	10%		
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Some are obvious	57%											
Incomprehensible	10%											

6	How suitable do you think the laws of Mongolia for doing business?	very good very bad bad in the middle good <table><thead><tr><th>Category</th><th>Percentage</th></tr></thead><tbody><tr><td>very good</td><td>10%</td></tr><tr><td>very bad</td><td>2%</td></tr><tr><td>bad</td><td>26%</td></tr><tr><td>in the middle</td><td>52%</td></tr><tr><td>good</td><td>10%</td></tr></tbody></table>	Category	Percentage	very good	10%	very bad	2%	bad	26%	in the middle	52%	good	10%												
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	LEGAL very good very bad bad in the middle good <table><thead><tr><th>Category</th><th>Percentage</th></tr></thead><tbody><tr><td>very good</td><td>11%</td></tr><tr><td>very bad</td><td>12%</td></tr><tr><td>bad</td><td>33%</td></tr><tr><td>in the middle</td><td>50%</td></tr><tr><td>good</td><td>11%</td></tr></tbody></table>	Category	Percentage	very good	11%	very bad	12%	bad	33%	in the middle	50%	good	11%	STANDARD PROCEDURE very good very bad bad in the middle good <table><thead><tr><th>Category</th><th>Percentage</th></tr></thead><tbody><tr><td>very good</td><td>11%</td></tr><tr><td>very bad</td><td>12%</td></tr><tr><td>bad</td><td>29%</td></tr><tr><td>in the middle</td><td>57%</td></tr><tr><td>good</td><td>11%</td></tr></tbody></table>	Category	Percentage	very good	11%	very bad	12%	bad	29%	in the middle	57%	good	11%
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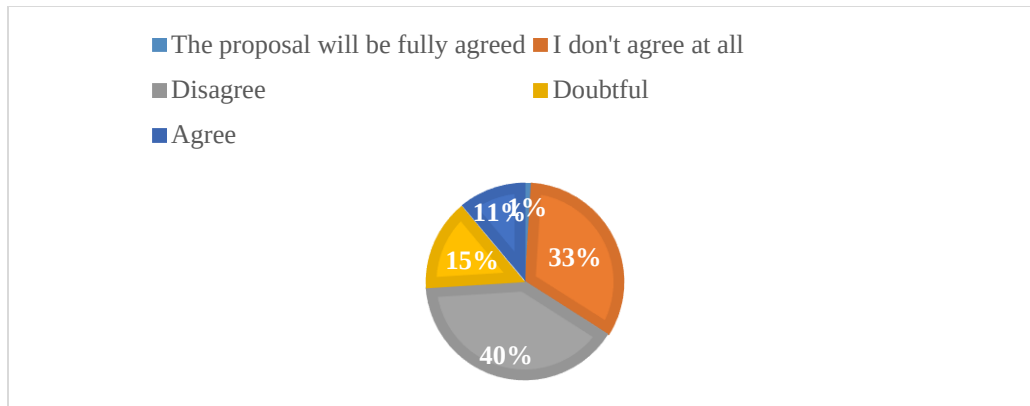
Integrity and ethics of entrepreneur

How ethical are the entrepreneurs?



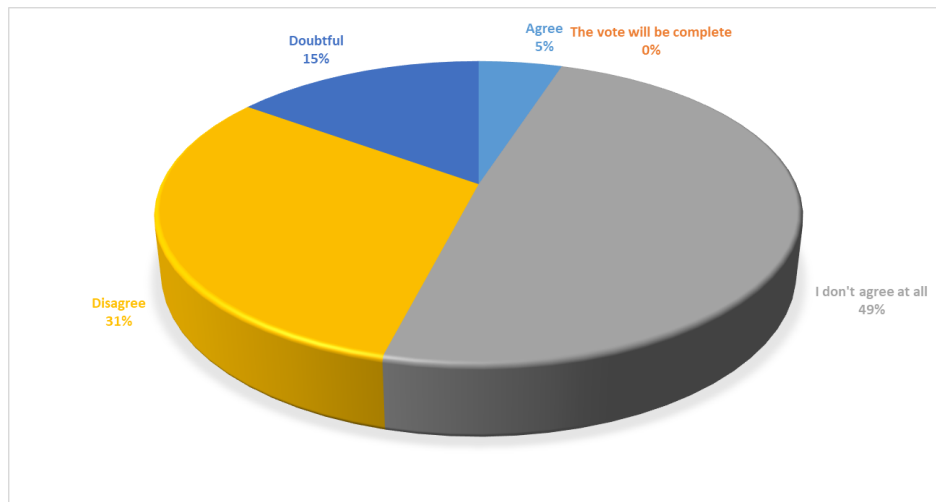
[Figure 2] A comparison of the ethics of entrepreneurs

If my good friend doesn't adhere to laws and standards when doing a business, it is not a wrong thing



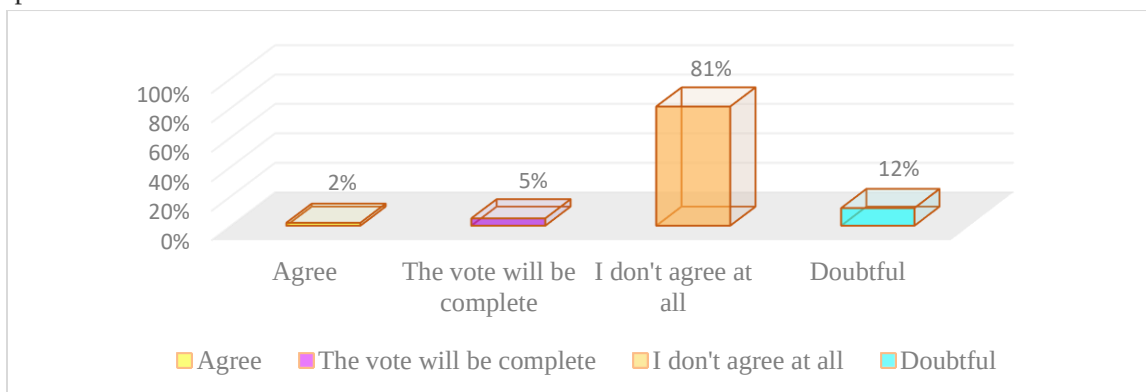
[Figure 3] Whether the legal framework is in place

If the illegal actions of the authorities have good impacts to my life, it is not a wrong thing



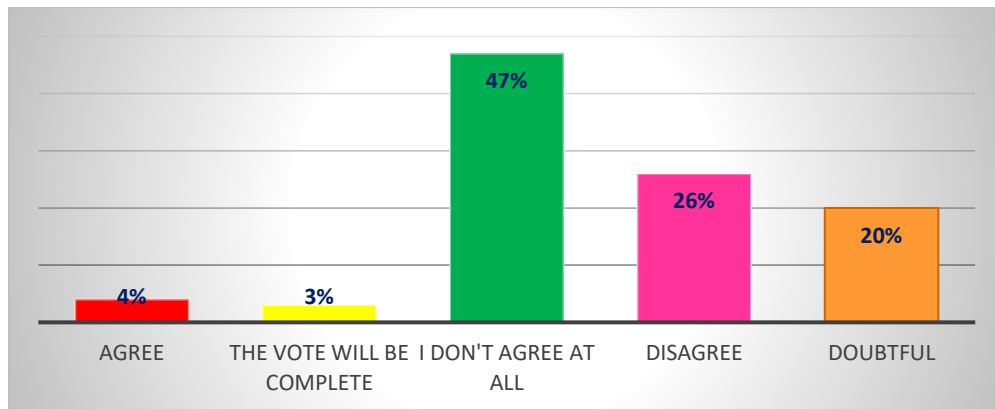
[Figure 4] Concurrence with illegal activities

Do you think it is correct if entrepreneurs use others' knowledge and intellectual property in their entrepreneurs like own?



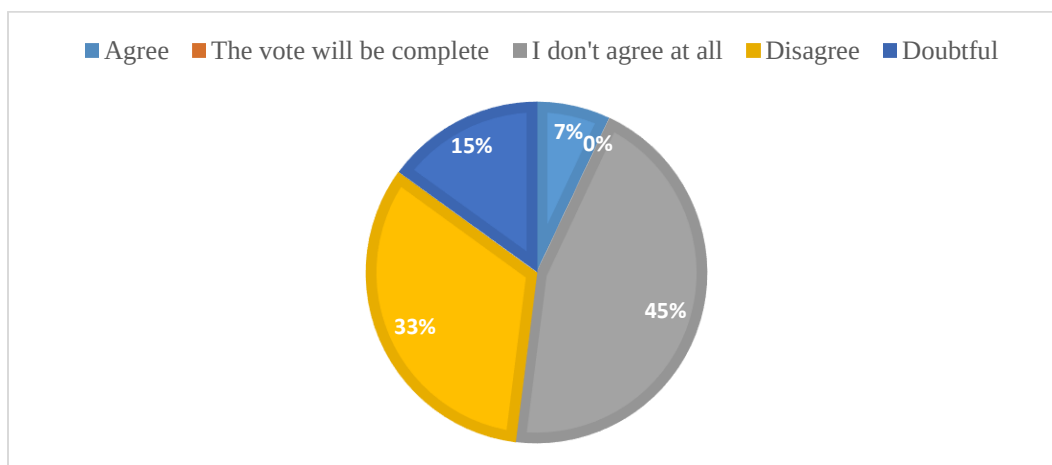
[Figure 5] Whether it is right or wrong for entrepreneurs to use the knowledge and intellectual property created by others as their own when conducting business

Do you think it's a good way to protect your business by giving gifts to government officials?



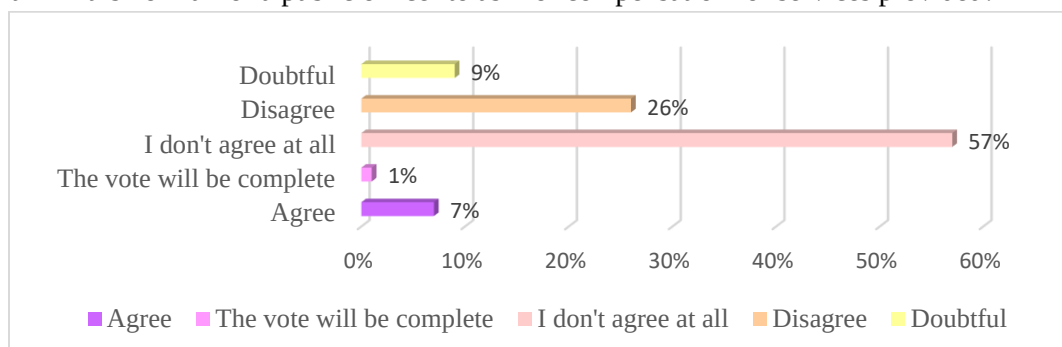
[Figure 6] Government supervision and protection

Do you think being rich is more important than being fair?



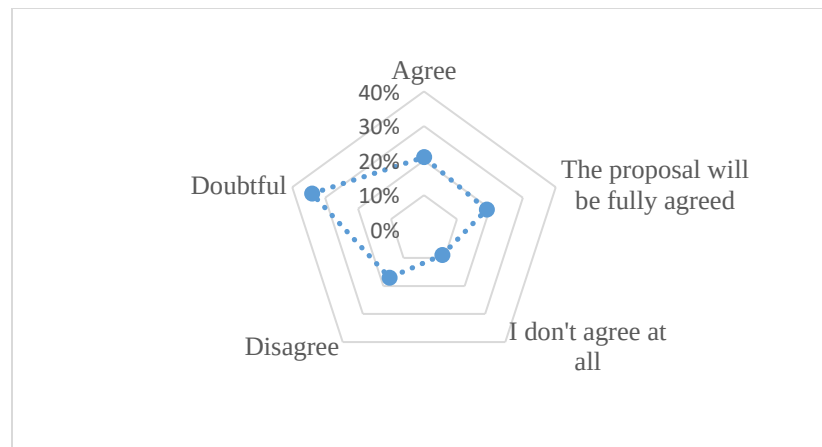
[Figure 7] On the question of fairness

Do you think it is normal for a public officer to ask for compensation for services provided?



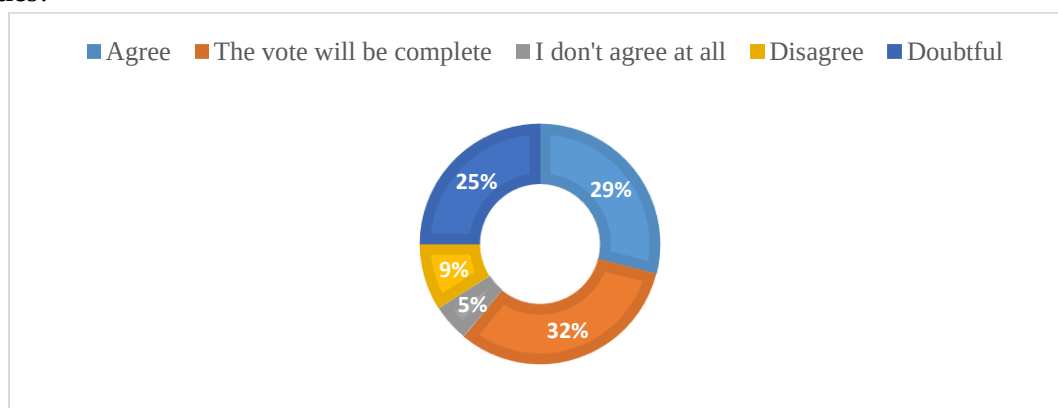
[Figure 8] Bribery of public officials

Even if the person who "broke the law" in the course of doing business was a good friend of mine, any businessperson should report it to the legal authorities



[Figure 9] In the matter of whether the law is violated or not

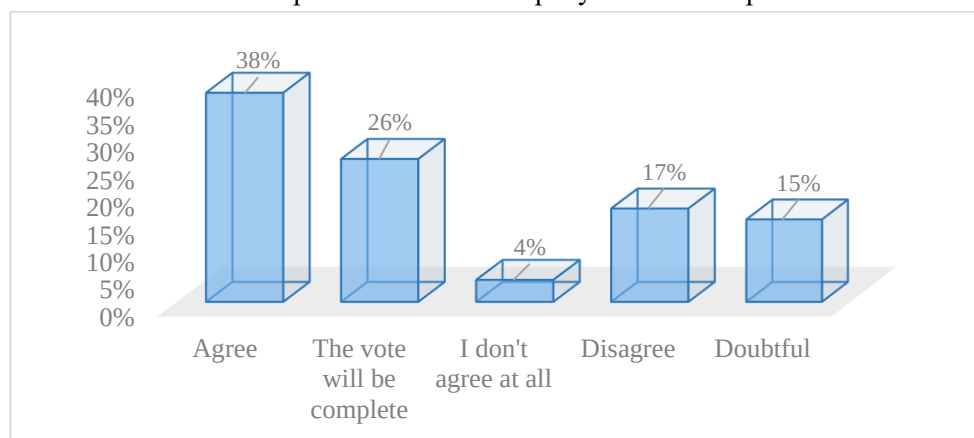
Is it correct for any employee of your organization to report breaches of laws and regulations to related authorities?



[Figure 10] Whether employees of the organization have reported violations of laws and regulations

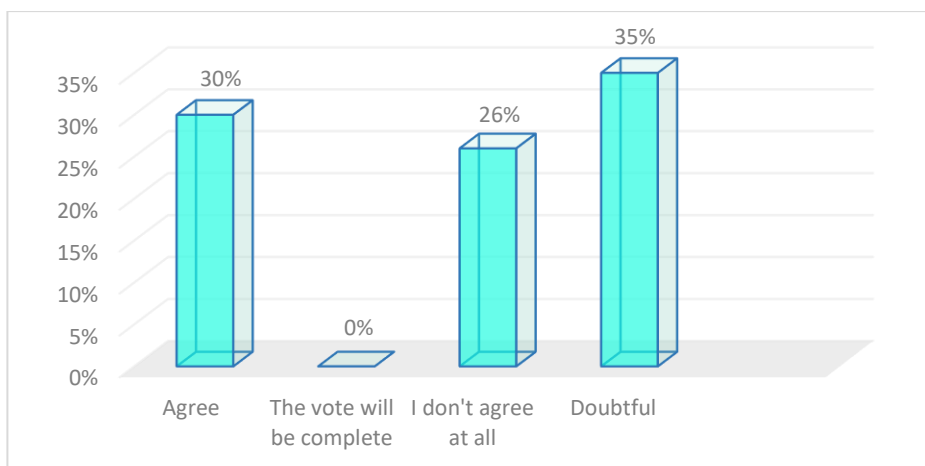
Implementation of laws and regulations

Compliance with the law is more important than the company's financial operations



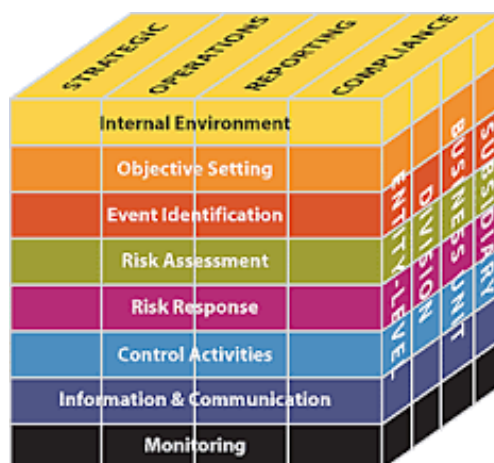
[Figure 11] Is it right to follow the law rather than the financial activities of the company?

In Mongolia, business of the entities which breach the laws, regulations, and standards in some ways is more successful than of those who strictly follow such laws, rules and standards



[Figure 12] Whether the business activities of enterprises that follow laws, rules, regulations and standards in Mongolia are successful

In order to evaluate the internal audit of “Erdenes Tavan Tolgoi” JSC by “COSO” model, it is necessary to evaluate the general system of **GOVERNANCE-RISK-COMPLIANCE (GRC)**.

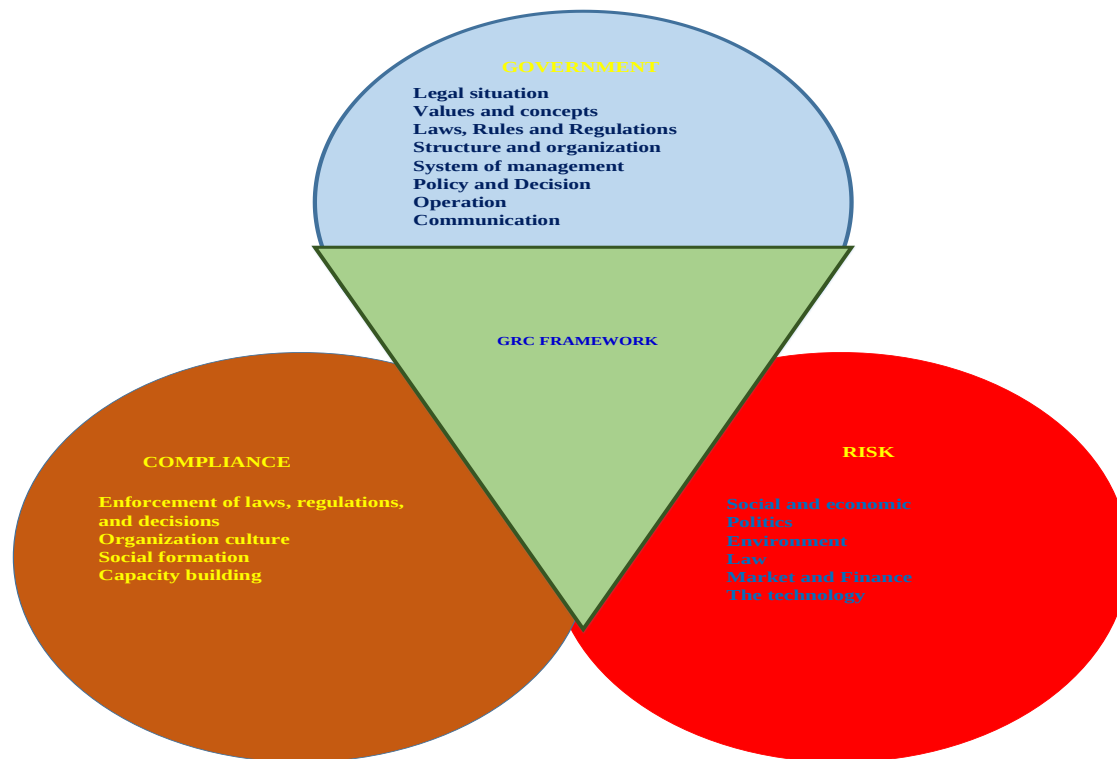


[Figure 13]. Evaluating the internal audit of “Erdenes Tavan Tolgoi” JSC
by “COSO” model

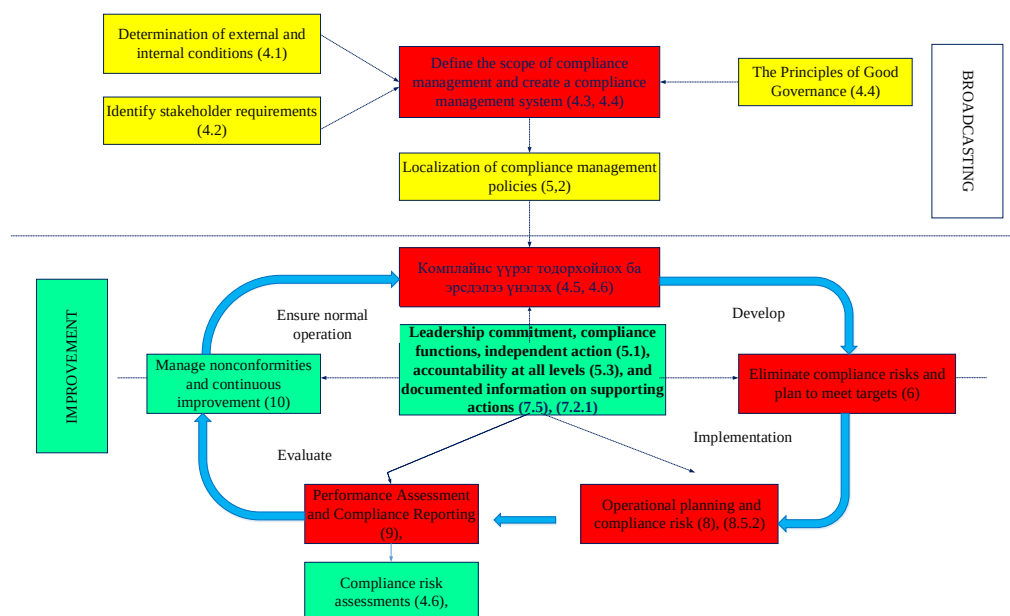
We measured the risk assessment of the business plan for 2021-2025 of Erdenes-Tavantolgoi JSC. There are 36 policies for improvement, 9 risky (non-conformities), 9 problems that needs risk plans, and 16 policies with medium risk to be taken care of, even though they will not cause much problems to operations.

The researcher concludes that it is necessary to focus on revealed non-conformities and develop a detailed risk plan [14].

The results of compliance management system-requirements and implementation research were evaluated as follows.



[Figure 14]. Scope of corporate governance



[Figure 15]. Results of preparedness for implementing the ISO 37301:2021 standard

Evaluating research results

Table 9. SWOT analysis

S-Strength	W-Weakness
S1-Organization and its status (4.1-4.2, 4.5); S2-Understanding needs and expectations of employees and other interested parties (5.1.3-5.3.1, 5.3.2, 6.2, 7.2.2, 7.5.1, 8.1-8.5.5, 8.5.1, 8.7, 9.1, 9.1.3, 9.1.4-9.1.5.); S3-Perception on the duties of compliance governance (5.1.3-5.3.1); S4- Clear responsibilities and powers in the organization (5.3.1) S5- Existence of compliance agency and reports	W1- Compliance risk assessment (4.5), (5.2), (9.2.1-) W2- Measures to consider risk and opportunities (6.1) W3- Anti-corruption control under supervision (8.5.2) W4- Recommendations and sources about compliance performance (9.1.2), W5- Internal audit (9.2.4, 9.31)
O-Opportunity	T-Threat
O1- Organization improvements and effects of compliance management system (10.1) O2- Commitment to fight corruption (8.6) O3-Financial control (8.3) O4-Control on documented data (7.5.1-7.5.2) O5-Resource (7.1, 5.3.1-5.3.4, 4.6, 5.1)	T1-Leadership commitment (5.1) T2-Control group to fight corruption, powers (5.1.1) T3-Ethical code, business code against compliance and corruption (5.3.1) T4- Evaluate and analyze the measures to consider risk and opportunities (6.1) T5-Management analysis – Planning for improvement by accepting recommendations on compliance performance, performance comparison problem (9.2.1-9.3.2)

4. Source. Developed by researcher

Table 10. Expert evaluation to SWOT analysis

S	Evaluation					Score	W	Evaluation					Score
	n1	n2	n3	n4	n5			n1	n2	n3	n4	n5	
S1	5	5	4	5	4	23	W1	5	5	5	5	5	25
S2	4	4	5	5	5	23	W2	5	4	4	5	5	23
S3	5	3	5	5	4	22	W3	3	4	4	5	4	20
S4	5	5	4	4	4	22	W4	5	5	5	5	4	24
S5	4	3	4	5	5	21	W5	5	4	4	5	5	23
O	Evaluation					Score	T	Evaluation					Score
O1	5	5	5	4	5	24	T1	5	5	5	4	5	24
O2	4	4	5	5	5	23	T2	5	4	4	5	5	23
O3	3	4	4	5	5	21	T3	5	3	4	4	5	22
O4	5	5	5	4	5	24	T4	5	4	4	5	5	23
O5	5	5	5	5	5	25	T5	4	5	5	5	4	23

Source. Developed by researcher

Table 11. TWOS matrix

S-Strength	Score	W-Weakness	Score
S1	23	W1	25
S2	23	W2	23
S3	22	W3	20
S4	22	W4	24
S5	21	W5	23
O-Opportunity	Score	SO-STRATEGIES	WO-STRATEGIES
O1	24	Compliance introduction will improve the organization's competitiveness.	Promoting the compliance to organizations will prevent from risks and provide successful operations.
O2	23		
O3	21		
O4	24		
O5	25		
T-Threat	Score	ST-STRATEGIES	WT-STRATEGIES
T1	24	Improve law enforcement and promote the ISO 37301:2021 standard	Improve the knowledge and skills of organization management and avoid incorrect and irrational recommendations
T2	23		
T3	22		
T4	23		
T5	23		

Source. Developed by researcher

Define compliance and anti-corruption action objectives (SMART) for each relevant function and process, create a plan to achieve the objectives, and create an integrated management system.

Establish goals for anti-corruption activities, necessary resources, criteria for assessing whether the goals have been achieved, and plan who will determine violations and impose punishments. Break down the objectives into each functional level and make work plans. It is observed from the research that it is necessary to pay attention to how it will be coordinated with other standards introduced earlier. Also, the results of the study show that when planning change, the goals, consequences, effects, availability of resources, distribution of responsibilities, and requirements for redistribution should be taken into account.

Conclusion

1. Awareness of entrepreneurs about compliance: 16% are aware, 31%- somewhat aware, 38% unaware, and 15% didn't reply. It is concluded here that systematic training is required.
2. Enforcement of the laws, rules, regulations, and standards of Mongolia: 50-57 %- somewhat, 11-13%-good, and 31-41%-bad. It is concluded that compliance management system should be emphasized on each sector.
3. Integrity and ethics of entrepreneurs: 13% good, 62% somewhat, and 13% bad. It was observed from the research that businesspersons must strongly pay attention to business ethics in the future.
4. More importance is given to compliance with laws and regulations than the company's financial operations: 64% agree and 36% doubted.

5. Summarizing the above conclusions, the results of the research proved that businesspersons agree that following the laws, rules, regulations, and standards in Mongolia is more successful, so the researcher concluded that it is appropriate to introduce integrated compliance management in every sector.

References

- [1] ISO 9000, Quality management systems -Fundamentals and vocabulary
- [2] ISO 9001, Quality management systems -Requirements
- [3] ISO 14001, Environmental management systems -Requirements with guidance for use
- [4] ISO 19011, Guidelines for auditing management systems
- [5] ISO 22000, Food safety management systems -Requirements for any organization in the food chain
- [6] ISO 26000, Guidance on social responsibility
- [7] ISO/IEC 27001, Information technology -Security techniques- Information security management systems-Requirements
- [8] ISO 31000, Risk management- Guidelines
- [9] IEC 31010, Risk management -Risk assessment techniques
- [10] ISO 37000, Guidance for the governance of organizations
- [11] ISO 37001, Anti-bribery management systems -Requirements with guidance for use
- [12] ISO 37002, Whistleblowing management systems -Guidelines
- [13] ISO Guide 73, Risk management -Vocabulary
- [14] ОУСБ-ын онлайн хайлтын платформ: <http://www.iso.org/obr>
- [15] ОУЦТК-ын электрон нэвтэрхий толь /Electroedia/:<http://www.electropedia.org/>

SSOT-43

Opportunity study for implementation of occupational health and safety standards

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Abstract: One of the today's challenges is: identifying the causes of industrial or near-hit incidents, studying factors, implementing MNS/ISO 45001:2018 standards and implement the culture in organization. This research introduces the research results to improve occupational safety and health regulations, minimize hazards and risk factor and to implement MNS/ISO45001:2018 standards at Shariin Gol LLC. In frame of research quantitative and qualitative analysis were made, hence based on consequence data analysis, used SPSS, COSO evaluation work. Main purpose of the research for giving guidance based on creating healthy and safety workplace environment for employee by implementing MNS/ISO 45001:2018 national standards to achieve management procedure, occupational safety and health regulations, standard law implementing coherency at Shariin Gol LLC. Consequently, it is expected to improve work environment by 10%, decrease near accidents incidents by 5%, COSO risk evaluation point to $\leq 1-3$ and to ensure a safe organization with minimal risk and zero injuries and accidents.

Keywords: risk, incident, policy, conformity and nonconformity

1. Introduction

One of the most significant factors is to maintain occupational safety, which leads to income and preserve in current market. The company is spending certain amount of budget on the issue to sustain accident free environment, takes safety measures to minimize industrial incident and occupational disease. Health and safety in the workplace are the number one concern of most businesses, yet still deaths and injuries occur.

2. Survey Research

OH&S management system is intended to enable an organization to provide safe and healthy workplaces, prevent work-related injury and ill health, and continually improve its OH&S performance. Expected result of OH&S is shown on [Figure 1].

Continuous improvement of OH&S performance



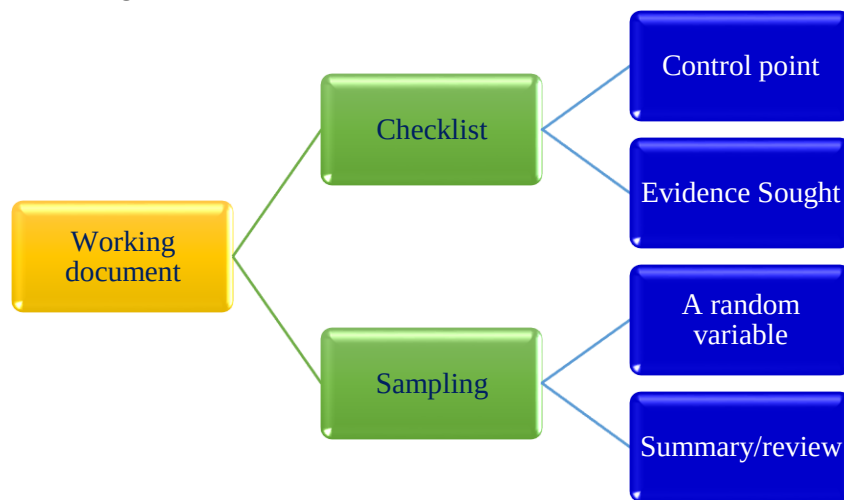
To meet the legal requirements and other requirements



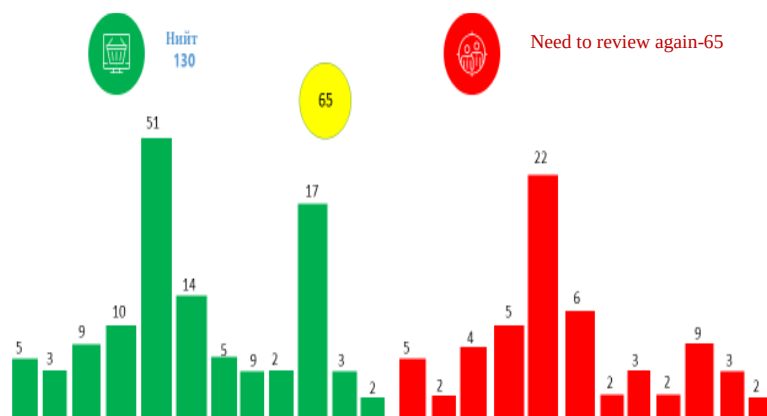
Completion of OH&S Objectives

[Figure 1]. Desired results within the OH&S management system

The purpose of the OH&S policy is to provide safe and healthy working conditions, to prevent work-related injury, to fulfil legal, social, economic, management, technology, health and industrial environment requirements, to eliminate hazards and reduce risks and occupational illness, to determine the needs and expectations of interested parties. Figure 2 and 3 are shown the criteria of determination on legal requirement of policy, regulations, and guidance at Shariin Gol LLC.



[Figure 2]. Criteria for determination of legal conformity

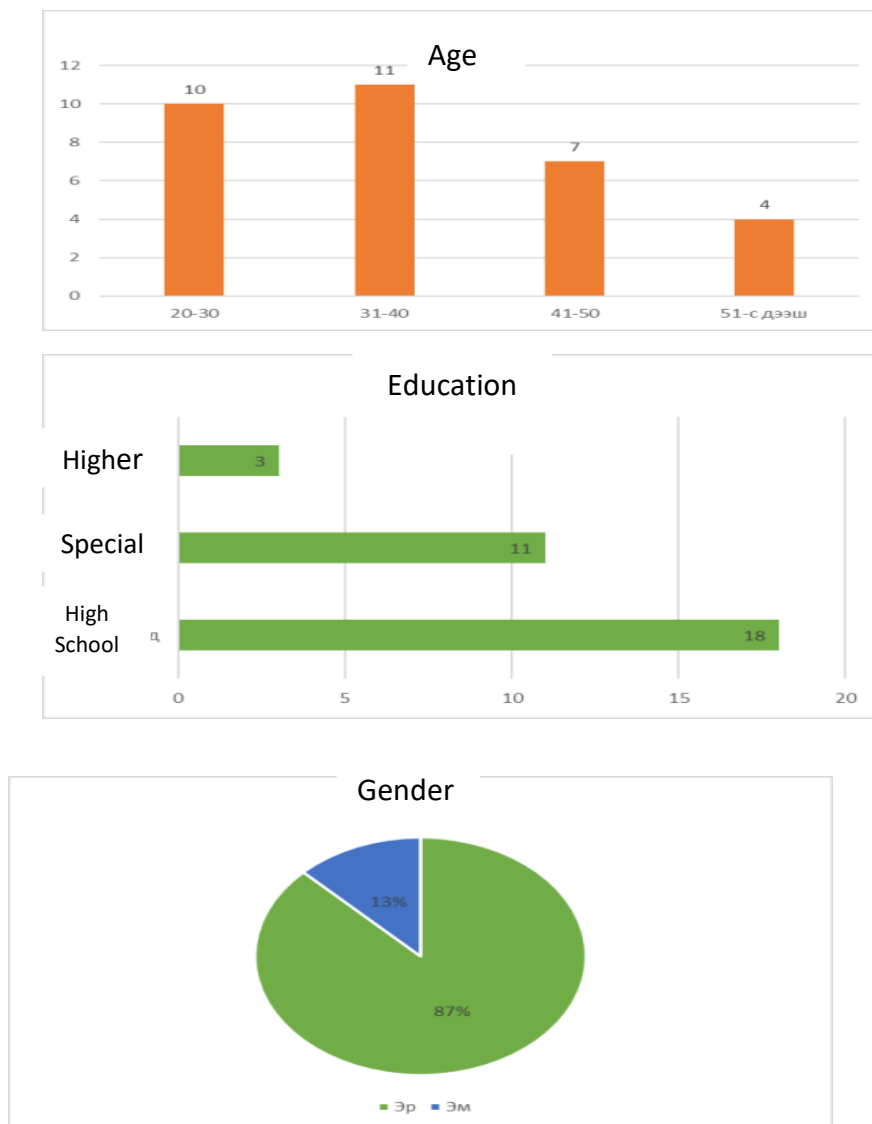


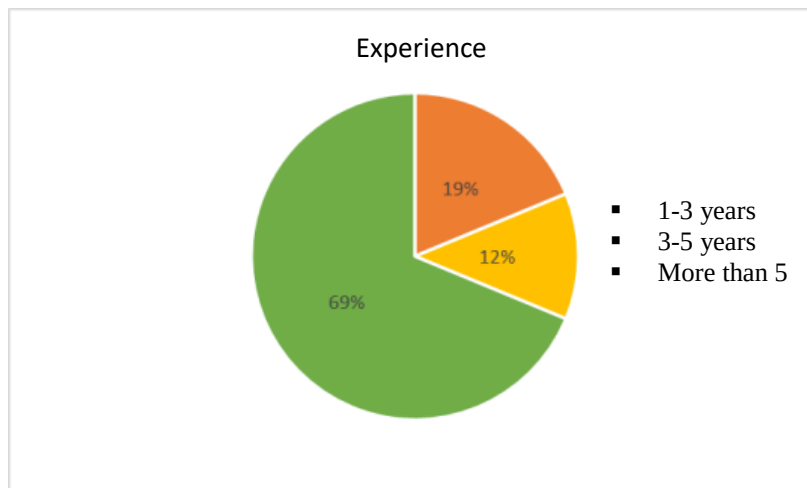
[Figure 3]. Document compliance survey¹

According to the survey, there are 130 documentations in framework of framework for OH&S, which consist of 6 policies and procedure, 128 laws, rules, regulations, instructions and forms in Mongolia. The company adopted and implemented 78 documentation or 65% out of above documentations peculiarly. However it confirmed by research, that 2 policies, Documents of foreign origin (ГТББ) -11, Documents of foreign origin (ГТББ) 6 laws, 4 forms have not implemented yet, lack of document order and nonconformity in standard processing.

Figure 4 is shown the age, gender, education and working experience of survey participants of 20 high risk jobs workplace map.

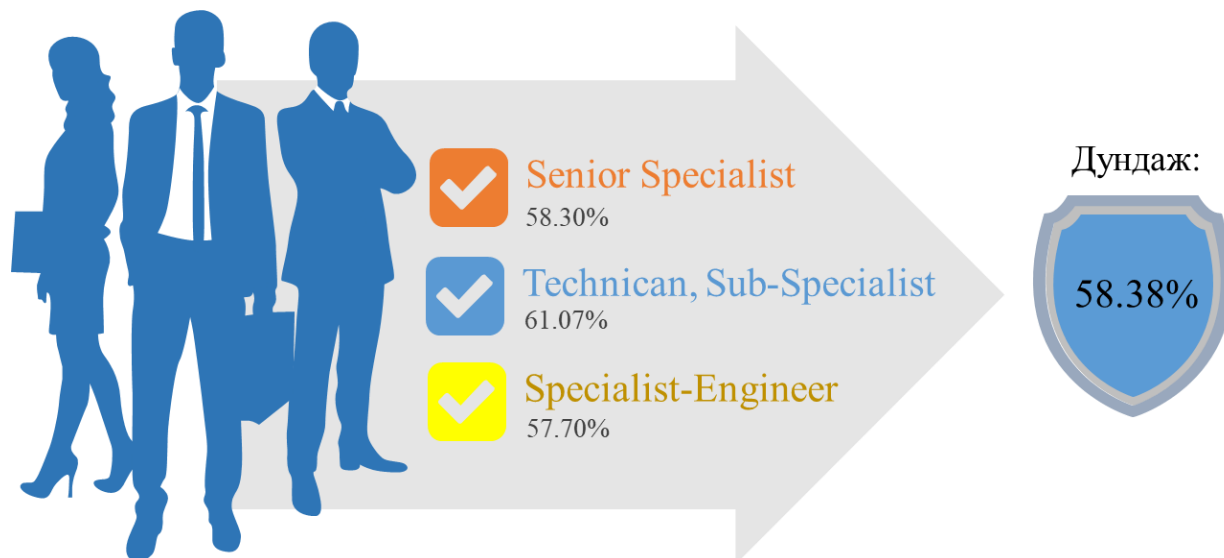
¹ Rule and procedure guidance of Shariin Gol LLC, UB, 2019





[Figure 4] Participants survey of workplace map

In total, 342 out 479 workers of Shariin Gol LLC gave Professional education test by using google form. The result is shown on [Figure 5].



[Figure 5]. Result of professional education test

According to the professional education test result average is 58.38 %, where highest score is 61,07% by technician or sub-specialist and lowest score is, 57.70% by specialist engineer, which shows necessity of capacity building. In addition, to articulate OH&S knowledge had taken proficiency test and summarized result on SPSS program. It is shown on [Figure 6].

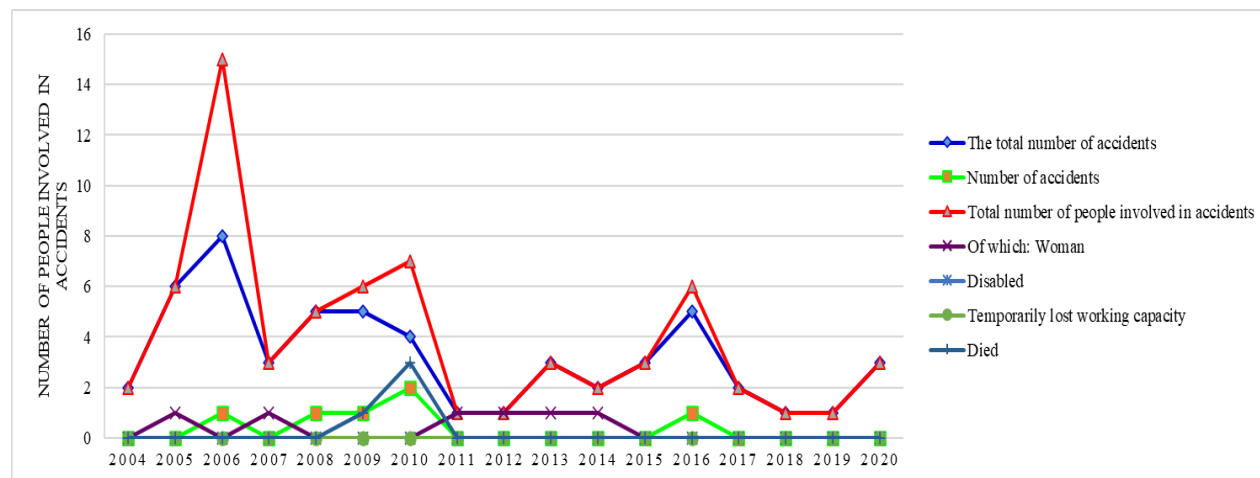
² www.inspection.gov.mn

Exam results ХАБЭА-Н ШАЛГАЛТЫН ДҮН					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30.7	1	6.7	6.7	6.7
	46.1	1	6.7	6.7	13.3
	53.8	3	20.0	20.0	33.3
	61.5	4	26.7	26.7	60.0
	69.2	3	20.0	20.0	80.0
	76.9	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Average 61.5/3

[Figure 6]. Result of articulate OH&S knowledge proficiency test

According to international statistical survey, incident cases are increasing every year, which caused two million deaths and four million injuries each year, one incident in every 15 seconds, one death in every 30 seconds. It is important to focus causes of each incident and calculate consequences. Moreover 4% of GDP spent on OH&S activity to maintain health and safety around world, which is 50 times more than budget on poverty and ten times more than war spending². Outcomes of survey incidents of mining sector by last 17 years, is shown on [figure 7].



[Figure 7]. Mining incidents survey registered at national level 2004-2020

In total 55 mining incidents registered, which included four deaths, six group incidents at Shariin Gol LLC in 2004-2020. There were three occupational incidents registered only in 2020 in company-wide. Causes of registered work-related incidents are shown on figure 8.

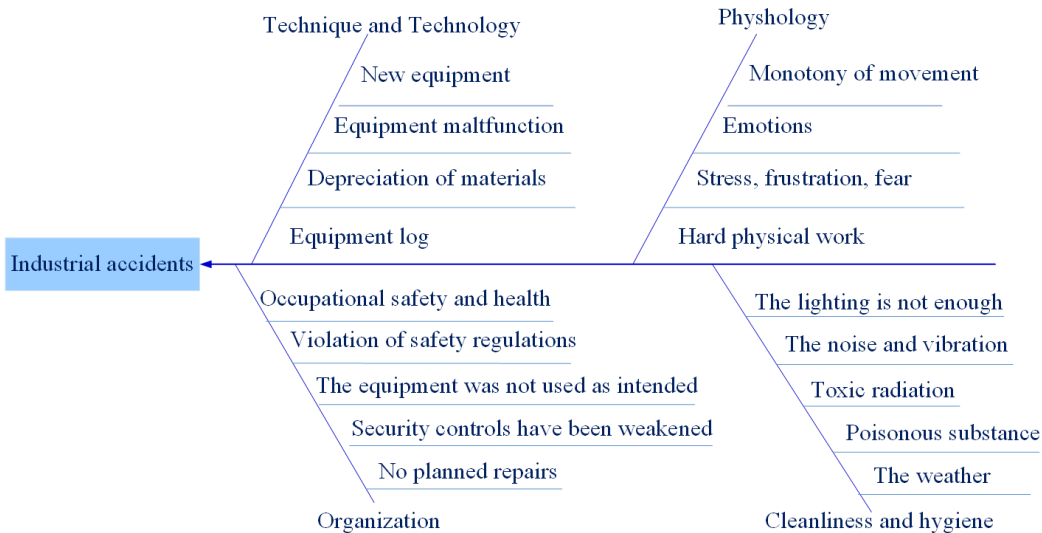


[Figure 8]. Mining incident causes

According to research, mining incidents are mostly occurred at united division of the mountain (YHX), Electrical network (LIIC), Department of Mechanical Plant (M3X) and might increase in number in further. Industrial incident frequency has been risen in 2004-2013 and been decreased after 2013 at Shariin Gol LLC. The industrial incident level was most high in 2006 and it fluctuates a lot after 2007. However it seems to have increased in 2020. The incident causes complications rate seems to tend increased by 15% in 2014, decreased by 6% in 2016 and 3% in 2017 and re-increased in 2020, which reminds us importance of the effectiveness of preventive and protective measures. Therefore to reduce industrial incidents, it is necessary to determine the cause(s) of the individual incident or nonconformity and make plan consequently. Thus to reduce incident causes we concluded to study psychological state of employees and the factors influencing.

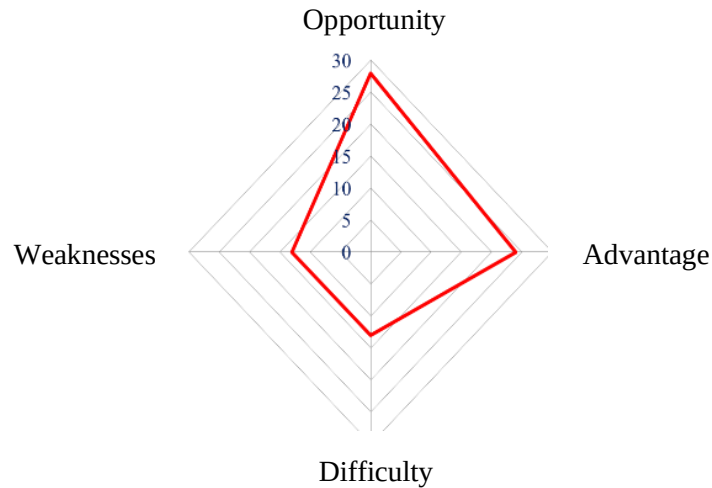
Psychological science is a huge one that covers all areas of human existence. Among preventive and protective measures from industrial incidents, studying individual attitudes and psychological

characteristics and providing appropriate safety guidance is most effective. These factors are important for individual overall satisfaction. According to interest in work survey by age: 87.5% of 56-60 years old, 55% of 18-25 years old, 54.7% of 26-35 years old, 63.7% of 36-45 years old, 67.5% of 46-55 are satisfied with work. Yet rest of participants' interest in work was middle or low and psychological state was imbalanced, which may cause near-hit incident. However the researcher observed perhaps a superficial psychological change or reaction might have stimulated due to the pandemic situation that has occurred in the last 1.5 years. Consequently to reduce main reasons of industrial incident, particularly accident caused by the negligence of the victim, we researched employee psychological state, influencing factors and consequences on [Figure 10].



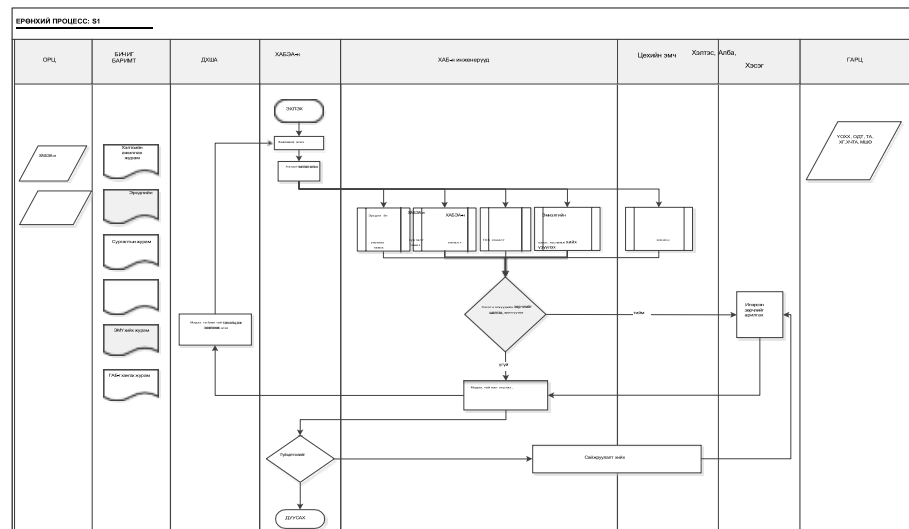
[Figure 10]. Industrial Incident Consequences

The results of the study show that HSE department shall demonstrate leadership and commitment with respect to the OH&S management system by: taking overall responsibility and accountability for the prevention of work-related injury and ill health, ensuring the integration of the OH&S requirements and policy into the organization's business processes, Ensuring the provision of safe and healthy workplaces and activities, determining actions to eliminate hazards and reduce OH&S risks and to establish OH&S internal audit and related documentation. The analysis of the internal environment of the company study result is shown on Figure 11.



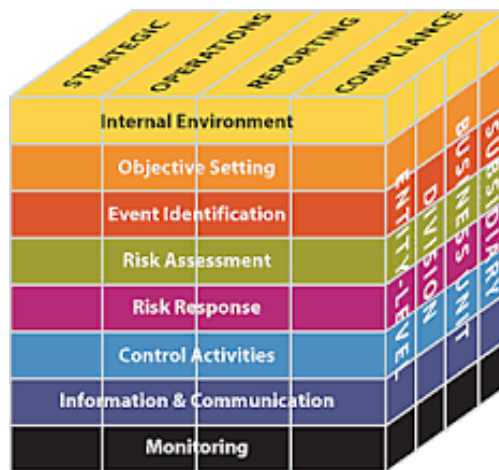
[Figure 11]. Company's internal environment study axis

OH&S policy advantages of the internal environment are 24 and disadvantages are 13, opportunity of external environment is 28 and challenge of external environment is 13 of Shariin Gol LLC. It is required to turn disadvantages and challenges into advantages by using OH&S policy. Based on the study data workplace map was drawn. Hence, we concluded there is an opportunity to implement not only MNS/ISO 45001:2018, but also other policy and standards equally with integrated management system. We developed 24 workplace maps to enhance OH&S management procedure and turn disadvantages into an opportunity. The general map is shown on [Figure 12]



[Figure 12]. OH&S procedure map at Shariin Gol LLC

Risk and opportunities are identified by the organization's context. Hence we used COSO risk management evaluation method and show on [Figure 13-14].

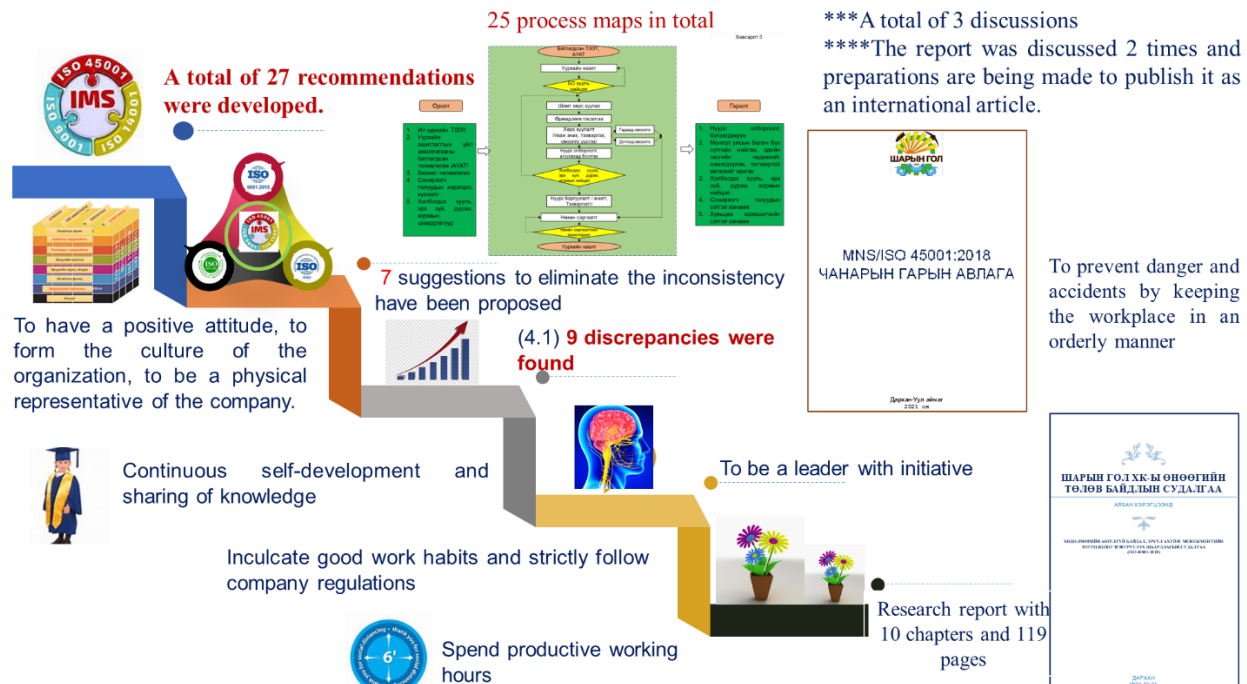


[Figure 13]. COSO risk management evaluation method

1	2	4	7	11	Consequences	Slightly
3	5	8	12	16		A little bit
6	9	10	17	20		Medium
10	14	18	21	23		Alarge amount
15	19	22	24	25		Seliously
Probability						
Rarly happens	Happens occasionally	Can happen	Will happen	Always		
less	There is no out work until the mine has taken					
in the middle	Hazards need to be controlled and counter measures taken					
height	Do not carry out work until the mine has taken measures and eliminated the risk.					

[Figure 14]. Risk assessment result

According to risk assessment result, the company might be most vulnerable group due to nonconformity-9 and absence of OH&S policy. Hence we recommend that to reduce nonconformity in short period and implement MNS/ISO 45001:2018 standards or 2-3 policy together with integrated management system. Expected outcomes of implementing MNS/ISO 45001:2018 standards together with integrated management system is shown on [Figure 15].



[Figure 15]. Expected outcome by implementing MNS/ISO 45001:2018 standards

Conclusion

1. OH&S policy advantages of the internal environment are 24 and disadvantages are 13, opportunity of external environment is 28 and challenge of external environment is 13 of Shariin Gol LLC. It is required to turn disadvantages and challenges into advantages by using OH&S policy.
2. The incident causes complications rate seems to tend increased by 15% in 2014, decreased by 6% in 2016 and 3% in 2017 and re-increased in 2020, which reminds us importance of the effectiveness of preventive and protective measures.
3. According to internal monitoring result, it concluded to have nonconformity-9 within the company procedure before implementing OH&S standards.
4. Hence it is expected to reduce nonconformity-9 and implement integrated management system.

We suggest following recommendation according to the research outcome:

1. Analyze disaster safety technologies
2. Develop smart plan for OH&S management system
3. Conduct detailed research on prevention of occupational disease
4. Improve workplace health monitoring and management
5. Establish, implement, monitor, evaluate and maintain a process (es) for hazard identification and prevention.
6. Reduce the impact of harmful substrate using health management and prevention technologies
7. Develop Gantt plan for evaluation and implementation

References

- [1] Л.Удвал ба Э.Сугарсүрэн. (2021), “Хөдөлмөрийн аюулгүй байдал, эрүүл мэндийн систем”, Улаанбаатар хот.
- [2] Ч.Авдай.(2019), “Судалгаа шинжилгээний ажил гүйцэтгэх арга зүй”, Улаанбаатар хот.
- [3] Ч.Буянжаргал, Б.Гансүх. (2002), “Үйлдвэрлэл үйлчилгээний менежмент”, Улаанбаатар хот.
- [4] Б.Оюунчимэг. (2005), “Сэтгэл судлалын хөгжлийн түүх”, Улаанбаатар хот.
- [5] Ю.К Недоступов. (2008), “Охрана труда”, город Москва.
- [6] Ларри Стаут. (2009), “Хүний нөөцийн удирдлага”, Улаанбаатар хот.
- [7] “Шарын гол” ХК-ы ХАБЭА-н хэлтэс, “Хөдөлмөрийн аюулгүй байдал, эрүүл ахуй” (2019), хууль, журам, зааврын эмхэтгэл, 2016(1).
- [8] Стандартчилал хэмжилзүйн газар. (2017), “Хөдөлмөрийн аюулгүй байдал, эрүүл ахуйн холбогдолтой стандартын эмхэтгэл”, Улаанбаатар хот.
- [9] MNS/ISO 45001:2018.07.16, 13.100
- [10] Эрх зүйн мэдээллийн нэгдсэн систем, (2022), <http://www.legalinfo.mn>
- [11] Мэргэжлийн хяналтын ерөнхий газар, (2022), <http://www.inspection.gov.mn>
- [12] ILO.org, (2022), <http://www.safety.com>
- [13] <https://en.wiktionary.org/wiki/estandard>, (2022), <http://www.estandard.mn>

SSED-44

Reflecting children's stages of cognitive development in career guidance activities

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Abstract: In this article, it is necessary to take into account the child's age, physical, mental, and cognitive development stage in career guidance. Teachers, educators and administrators of all levels of educational institutions should pay attention to the aspect of knowledge acquisition or human cognition in their career guidance activities, and pay attention to the process of formation of children's behavior, morals, and personal characteristics in their daily activities. In other words, focusing on the child's age, physical, mental, and personal characteristics, educational environment, and teacher's activities, we aim to find ways to acquire career guidance from an early age, carry out significant research and analysis, and then explore the possibility of incorporating it into the curriculum and syllabus. Career development theory proposed by Ginsberg (1951) (Ginsberg) and Donald Super (Donald Super) explains the process of formation of career guidance with the stage of cognitive development of children. According to this theory, the stages of career guidance depend on the characteristics of children's elementary, middle, high school and post-graduation, so it is recommended to implement training activities suitable for each stage.

Key words: child's age, physical characteristics, cognition, future occupation, lifelong learning

SSED-45

On The issue of preparing counselors in career guidance

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Abstract: Career guidance is a process of collecting, processing and implementing information necessary for making wise career-related decisions, incorporating the knowledge, skills, and attitudes appropriate to each specific stage of students' development into the curriculum. Up to date, many theories have been developed by researchers that describe the complex phenomenon and process of career guidance. As evidenced by these theories, career guidance is a complex phenomenon, and career choice is one of the most important decisions people make throughout their lives. However, many people find it difficult to decide on a career. The career guidance process is related to the labor market or has a chain effect. Career guidance is absent in most schools' management and operational planning, with the exception of a few schools. 66% of students answered that they get career guidance information from their parents, siblings and friends. According to the research, teachers, students, parents, and administrators misunderstand the advice and lectures on how to choose subjects for the general entrance exam, which exams to take, and how to work on the exam as "career guidance" activities. Therefore, there is an urgent need to systematically prepare career guidance counselors at the national level.

Keywords: Career guidance counselor, teacher, student, parents

HSOT-46

Analysing Business Management Students' English Needs in School of Technology in Darkhan-Uul, MUST

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Abstract. Students in engineering who take English for Specific Purposes (ESP) will automatically have more opportunities to access international journals and textbooks that are relevant to their studies. Therefore, the purpose of this study was to investigate the Business Management students' ESP learning process at the School of Technology in Darkhan-Uul, Mongolian University of Science and Technology. A questionnaire was given to twenty students selected through purpose sampling in order to accomplish the goals of the study. The most important finding is that Business Management students have positive attitudes toward ESP. However, they prefer to be taught using a combination of ESP and General English (EGP) as the instructional method. As a result, the students' preferences must be the primary focus of ESP development. It implies that ESP teaching and reading material ones are proposed to focus on those findings. In addition, it is discovered that the informants are dissatisfied with the EGP instruction and are willing to meet the challenging requirements of the ESP course.

Keywords: ESP development, teaching, business management student, Needs analysis, questionnaire

1. Introduction

The Mongolian University of Science and Technology, one of the leading state universities in the country, offers educational opportunities to students ranging from first-year undergraduates to doctoral-level candidates in engineering, technology, and others. Commonly, English language proficiency matters greatly in the global economy, to professionals at both the national and international levels. Professionals, including engineers, are expected to communicate effectively in English, even though they often use their mother tongue in everyday life. In the 21st century, engineers must know not only how to convey technical information effectively, but also how to perform in the workplace with acceptable communication skills [1]. Today, more than 30% of the world's population communicates in English every day, and more than 60 countries have declared English as their mother tongue. English is the primary language of international peace, trade, and cooperation with organizations such as the United Nations, the European Union, and the World Bank. There is also an English exam that bridges world universities such as Harvard, Stanford, MIT, and Oxford, which raise hundreds of scientists, billionaires, innovators, and purposiveness every year. The demand for English and the quality of English speakers cannot be overestimated. According to Naratsetseg "Mongolian educational institutions need to prepare well-trained specialists who meet the international standards of their field of study. Teaching professional English is very different from teaching general English. In professional English classes, teachers provide not only English language skills but also the

knowledge required to work in the professional field. In other words, students acquire English language skills that can be used in the workplace. Therefore, one of the appropriate methods for teaching this skill, the use of the "Case study" method in training, is effective. This study is aimed at identifying the Business Management students' needs for English, their corresponding course of study at the School of Technology in Darkhan-Uul, MUST.

2. Survey Research

2.1 What is Needs Analysis?

Teaching English and other foreign languages is one of the specific factors that promote the development of education, as well as the importance of international communication and research, and through it, it increases the benefits of learning and teaching and plays a special role in spreading necessary knowledge and information to the masses. Therefore, for non-English-speaking countries, the need to implement active methods of language learning in accordance with the concept of child-centered education has been strongly discussed, including the importance of learning and teaching English.

There are many ways to obtain important information about the verification code. Researchers often use interrogation techniques and interviews to obtain important information. In development, there are many programs to obtain code information for analysis purposes. [3] Dudley-Evans and St. John pointed out that the main data collection methods for needs assessment are questionnaires, analysis of oral and written texts, interviews, interviews, observations, assessment, and evaluation [4]. In Noonan's theory, needs are divided into "needs" and "objective needs". These needs represent the purpose of the study. The insights from the needs analysis focus on the learner's goals, values, and understanding. This analysis shows why students are learning a second language, classroom activities, and activities that students enjoy. The purpose of the analysis is to obtain information about the subject. [5]. Needs analysis is essential to ensure that our engineering students are equipped with the necessary communication skills to face their challenging professional environment.

3. Methods

3.1 Research methods

This research is the curriculum of the Mongolian University of Science and Technology Darkhan-Uul Institute of Technology. Data collection was carried out between October 2022 and March 2023, when students were attending 2nd and 3rd grade. It is divided into two phases: interviews and questions. Three questions were asked. First aid is about their motivation to learn business English. The second group is their experience of learning business English, including the positive experiences, challenges, and cultural conflicts they have faced, and how these experiences think about their mother tongue for understanding international business professionals. The third group refers to the elites' experience in business English education and its impact on their understanding of international business people. Participants were asked open-ended questions lasting 60 minutes.

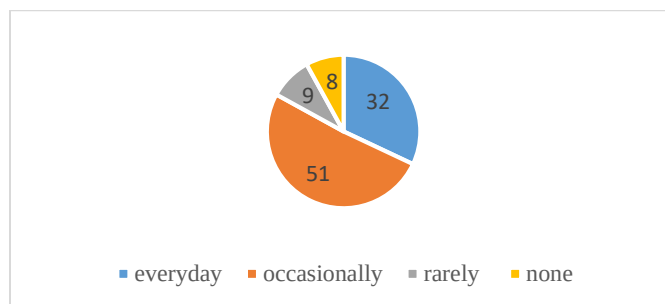
4. Results, Data Analysis

4.1 Finding

4.1.1 The Questionnaire section

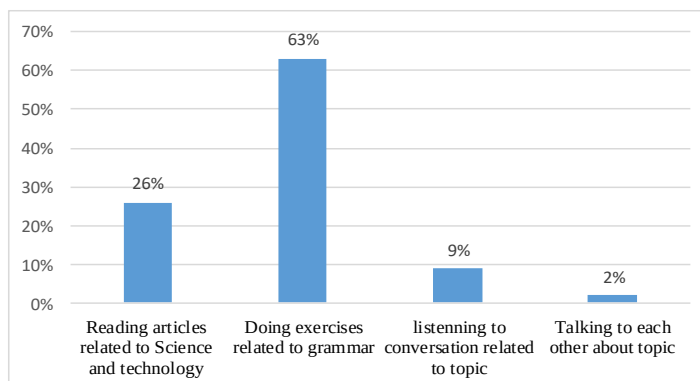
The questionnaire was answered by the students who take Business English at the university. The questionnaire consisted of items including language skills, sub-skills, and language needs, and open-ended

questions was included to obtain data on their view concerning the priority of language skills and language use and about improving the language abilities of Business management students in the School of Technology. The findings are shown in Figure 1.



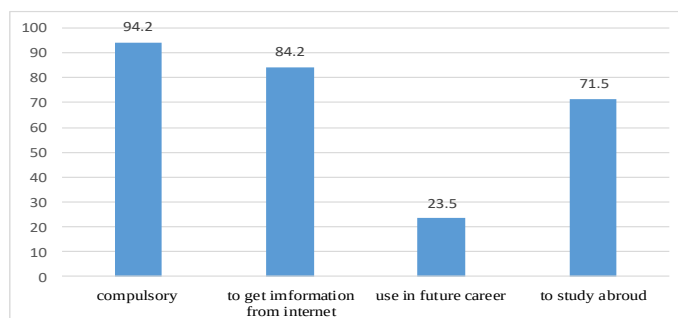
[Figure 1.] Usage of English in everyday life

According to Figure 1, 32% of respondents always use English to communicate with others at home or school. On the other hand, 50% of respondents said they sometimes use English, 9% rarely and 8% rarely communicate with others in English at home or school. The second question of the study aimed at investigating what types of materials students use during the Business English class. The finding shows that students' listening and speaking skills could not be properly developed by the materials that are used in the Business English courses.



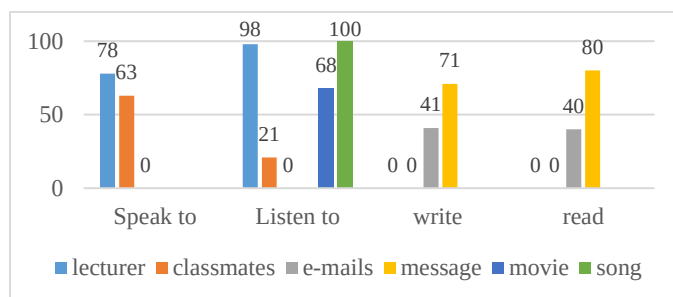
[Figure 2]. Percentage of exercises in lessons

The finding shows that students' listening and speaking skills could not be properly developed by the materials that are used in the English courses.



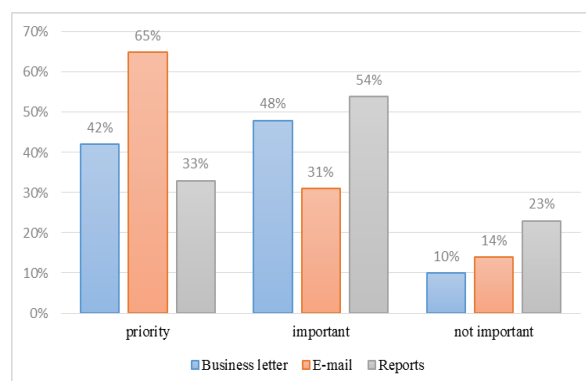
[Figure 3.] Percentage of the reason students take Business English

The finding shows that most of the students take English that is compulsory and the fewest number of students understand the English needs in their future career. Next, the students were asked to specify the skills they used during their course for business English. The findings are shown in Figure 4.



[Figure 4] Usage Of English Language Skills of Students

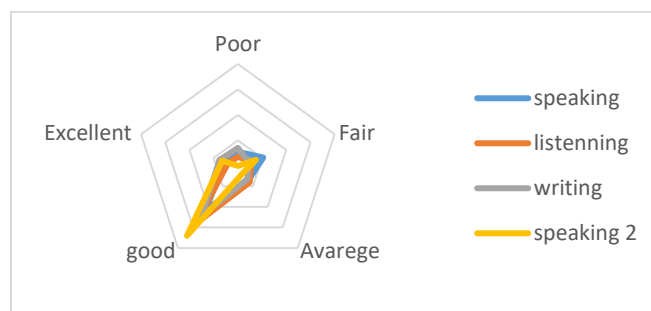
According to the data in Figure 4, most respondents (78%) speak English with their English teachers and 63% communicate with their colleagues in English. Using English to listen is similar to speaking; 98% of respondents listen to their English teachers and 21% listen to their English-speaking colleagues. It's best to listen to your English teacher because most of the internship instructions are in English.



[Figure 5.] Percentage of Importance in Areas of Writing

The question was to determine the comparative importance to students in the areas of writing. Writing e-mails is the highest “priority”, 65 percent, while 23 percent considered writing reports as “not important”. Most students understood that writing business letters is very important when developing their writing skills.

In the third set of the questionnaire, the students were asked to rate their English language abilities. The findings are presented in Figure 6.



[Figure 6.] Students' Self-Rating Of Their English Language Skills

This figure shows that the highest self-rated skill was reading with 63 percent of the participants; the lowest-rated skills were speaking and listening. According to the findings, students' materials related to developing speaking and listening skills during classes were the fewest. According to findings shown in Figure 6, 56% of the students considered their listening skills as good, 8% as good and 7% as bad. Regarding reading, 68% is good, with 7% being the lowest. Not a single business student thinks his reading is bad. When it comes to writing, 49% of people consider their ability to be very good, and 13% of people consider their writing average or very good. 9% of respondents rated their writing skills as average.

4.1.2 The Interview Session

Second, we explore our English curriculum and syllabus for English of Specific Purposes, looking at what is required for effective professional communication in the future. The interview is investigated:

- What problems students face in improving their English skills
- What sorts of teaching aids do they need from their Business English courses
- What types of materials they think their ESP should provide

According to the results of the survey, findings show that almost half of the respondents, or 51.4% consider their own laziness to be the main obstacle. This means that, despite the abundance of resources and opportunities, it is difficult for people to fight their vices and thoroughly take up the study of a non-native language. This attitude can affect their future career and life in general. Following the lead of laziness, a person loses interest in development and improvement. Ignorance of the language deprives people of the opportunity to meet and communicate with citizens of other countries, expand their knowledge, travel, and get a well-paid job. A participant in the interview believes that a modern person does not have enough time and practice for "linguistic exploits". One cannot but agree with this assessment. Often we spend more time on issues that do not contribute to our development. The daily routine sucks without bringing any benefit, and in doing so, entails the problem of lack of practice. Knowing the theory is sometimes not enough, students need to apply their own knowledge and constantly improve it. About 10% of the responses fell on the item "no ability." Only 4 people suggest that the reason for the failure is poor teaching. Perhaps this group should make more efforts, discover new sources of knowledge, and pay attention not only to external but also to internal barriers to the study of this subject. Only one student of the respondents reported that they do not need to know English.

5. Discussion

Knowledge of the English language is necessary for a specialist in the 21st century, regardless of what kind of work you choose. All professionals consider that the possession of this language reveals to people extensive abilities - communication, education, and effective career advancement. The English language enters our life activity, without our participation of ourselves, by itself. The purpose of the study was to determine the English language needs of Business management students, examine the communication skills required in the workplace, and assess our English language requirements at MUST.

1. The research results show that Business management students of MUST have some reasonable special language needs related to English. Unfortunately, MUST's English syllabus does not adequately reflect the English proficiency required to meet the requirements of an engineer's job description.
2. The average learner has about 8 years of English learning experience. However, her knowledge of English is not good. However, her writing skills are better than her speaking and listening skills. Therefore, the focus should

be on the speaking and listening skills they wish to use in their future careers.

3. For the selection of course materials, teachers must refer to various sources such as B. Instructions, equipment manuals, CDs, DVDs, materials used at work, and websites containing business letters, conversations, instructions, and telephone calls. A variety of materials should be available, not just textbooks. These will be more helpful for students to use English at work.

References

- [1] Ali, R. F. (2003). *The role of needs analysis in ESL program design*. South Asian Language Review, 13(1), 39-59.
- [2] Dudley-Evans, T., & St John, M. J. (1998). *Developments in English for a specific purpose: A multi-disciplinary approach*. Cambridge: Cambridge University Press.
- [3] Ellis, M., & Johnson, C. (2010). *Teaching Business English: An Introduction to Business English for Language Teachers, Trainers, and Course Organizers*: OUP Oxford.
- [4] Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centered approach*. Cambridge: Cambridge University Press.
- [5] Robinson P. C. An overview of English for specific purposes // Working with Language: a Multidisciplinary Consideration of Language Use in WorkContexts / ed. H. Coleman. Berlin : Mouton de Gruyter. 1989. P. 395–427.
- [6] Widodi, H. P. (2017). *Designing a model of business English materials using a communicative approach*. Bahasa dan Seni, 35(1), 88-93.
- [7] Б.Сувд-Эрдэнэ (2019) *Мэргэжлийн англи хэлний хичээлийг багаар заах арга зүйн туршилт судалгаа* Улаанбаатар 2019

HSOT-47

A Comparative Analysis of ESP Textbook: A Case of Business English

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Abstract. One of the most important aspects that can significantly change the teaching and learning process is the choice of textbooks and teaching materials to be used in language classes. As a result, the teacher should carefully consider which coursebook and teaching materials are best suited to the classroom. This study aims at comparing two different ESP textbooks by using a blended exploration technique for content text-based investigation with the perception and reviews discoveries through the relative contextual investigation. In addition, the paper will rely on comparing the survey results regarding students' attitudes and feedback regarding the course's usefulness. This article aims to demonstrate that students are not motivated to improve or accelerate their Business English potential by deeply integrating extremely complex and technical business content. This research will provide some implications for teachers or material designers to conduct effective teaching, material development, and production based on the results.

Keywords: English for Specific Purposes, syllabus, coursebook evaluation, Revised Bloom Taxonomy

1. Introduction

English language training in our country becomes more and more sophisticated every year, however, there are still areas for improvement, especially English in universities' language curricula and standards. There is no common understanding of training techniques for program development quality of education due to backwardness. According to McGrath, "Textbooks tend to dictate what is taught, in what order, and to some extent how and what learners learn." The researcher believes that textbooks are deemed the most crucial element in the process of learning and teaching and that textbook evaluation is one of the most important tasks for future course success. For academics and researchers focusing on university teaching and various related components, class materials remain a crucial aspect, and due to the plethora of ELT book publications, there is a significant variety to choose from. Despite the important role that textbooks play in the majority of EFL classes, there has been a lack of research on the methods and reasons behind teachers' selection of materials.[1] Two major Business English textbooks will be discussed in this article. As the main course book for the Business English course in the academic year 2021 -2022 Fall semester, John Taylor - Jeff Zeter's first book, Business English, was published by Express Publishing in 2011. Secondly, Garnet Education Career Express 2013 will be used in the School of Technology in Darkhan-Uul, MUST, a second-year undergraduate program for Business English for students on a Business English language course at the university level in Spring 2022-2023.

2. The Literature Review on ESP Books Evaluation

2.1 Textbook Evaluation

According to N.Begz the necessities for present-day textbooks are coherence in mastering dreams and programs; The content material of the e-book is specially marked as going past the content material of the country-wide curriculum whether or not; coherence with scientific findings; quotations and quotations from the writings of others; workouts and assignments in textbooks; social, historic and cultural issues. It is in the textbook the historic groundwork of the cloth and examples from the actual lifestyles of students; how a whole lot of cultural and historic traditions of the human beings are mirrored in textbooks; textbooks and sustainable improvement issues; to learn It is believed that the content material of writing will consist of gender sensitivity. Attempting to measure the value of textbooks is the goal of textbook evaluation. It involves making judgments about the effects of textbooks on learners, instructors, and administrators who use them.

These positive effects can be seen in the long term, leading to improved profitability and a better overall work environment as credibility, validity, flexibility, etc. As a means of examining textbooks, textbook evaluation is important in the classroom since it can identify their strengths and weaknesses in general, as well as their relevance to the specific context. It helps teachers understand the textbook so that they can amend their teaching to suit the course aims, and learners' needs.[3]. Regarding one-of-a-kind sorts of supplies evaluation, distinguishes between macro-evaluation from micro-evaluation: Marco-evaluation can be described as a distinction that seeks to reply to one or every one of the following questions: To what extent used to be the program/project fantastic and environment friendly in assembly its goals.

3. Methods

3.1 Research aim

The purpose of this study is to assess two Business English teaching textbooks in light of hidden curriculum i. e. the underlying or implicit ideological beliefs that underlie the language and text of these textbooks. They support education and teaching.

3.2 Research Questions

1. Do undergraduate students hold varying views concerning their English for Specific Purposes textbooks?
2. Do Management students hold favorable opinions about their ESP course readings?

3.3 Materials

The evaluated textbooks are:

1. John Taylor – Jeff Zeter, Business English by Express Publishing 2011
2. Butzphal with Maier Fairclough, Business English by Garnet Education Career Express 2013

Both books are educational path books prescribed for students at the School of Technology in Darkhan-Uul, MUST as the material for ESP courses for undergraduate students of Management.

3.3. Participants

Students studying at the School of Technology in Darkhan-Uul which is a branch of the Mongolian University of Science and Technology have to take English for Specific Purposes as a compulsory course. In the 2022-2023 academic year 25 students are taking Business English as an ESP.

3.4. Instrument

In this study, a questionnaire created by Litz (2005) was utilized to evaluate student textbooks. The survey gauges six different aspects of the textbooks, including the accuracy and relevance of the content to students' needs, the level of motivation the books inspire, and the effectiveness of the materials in developing the four primary language skills. Additionally, the survey assesses the usefulness of the activities within the books for developing said skills. Each item in the questionnaire contained five options on a Likert Scale, ranging from "strongly agree" to "strongly disagree."

3.5. Procedure

The objective of this study was to evaluate and compare the views of students regarding coursebooks used in their ESP courses. A questionnaire was distributed to the students to gather their opinions on the textbooks they were using. Descriptive statistics were used, specifically independent samples t-test, to determine if there were any significant differences between the opinions of the two coursebooks. The study also investigated whether the students had a positive attitude towards the books in terms of meeting their requirements and interests related to the course objectives.

4. Results, Data Analysis

4.1 Findings

To address the initial research query, we executed an independent samples t-test to ascertain the presence of a noteworthy discrepancy in the viewpoints of both coursebooks. The outcomes are detailed in Table 2.

[Table 2] Independent Samples T-test

t	dt	Sig(2-tailed)	Mean differences	Std. Error Difference
.712	25	.412	2.65	3.14

At a significance level of p-value .05, the Business English textbook by John Taylor – Jeff Zeter (M = 94.60, SD = 18.30) and the Business English textbook by Butzphal with Maier Fairclough (M = 93.85, SD = 17.40) showed no significant difference according to t-test results with (df = 80); $t(80) = .712$ and p-value of .051. Therefore, the student's opinions on the two Business English textbooks are the same and any differences may not be significant. After a mean evaluation, the questions were categorized just so each query was modified under the category of one of the factors. Then those questions have been calculated to be added up to give a score representing the issue to appear if there is a good-sized difference in a few of the underlying elements and variables within the coursebooks, using SPSS, an impartial samples t-check have become used to assess college students' responses about coursebooks, the result of this is represented in the following table.

[Table 3] Independent T-test for each factor

	t	dt	Sig (2-tailed)	Mean difference	Std.error difference
Validity	.897	25	.324	.612	.612
Subject & Content	.423	25	.618	.231	.541
Language Type	1.014	25	.219	.648	.590
Motivating	-.109	25	.799	.069	.608
Speaking	.397	25	.653	.108	.241
Listening	.588	25	.485	.274	.410
Reading	.462	25	.624	.288	.608
Writing	.203	25	.788	.104	.488
Activities	.211	25	.802	.288	1.322

After the outcomes indicated no huge distinction between the 2 coursebooks consistent with the result of taking a look, one-sample t-test was carried out to look if the scores given by means of the students

are low or high. To reply to the second research query, a one-pattern t-take-a-look was conducted for each variable separately, the results are shown in Table 4.

[Table 4] One sample T-test

	Test value	t	df	Sig (2-tailed)	Mean differences
Activities	49	-27.758	2	.000	-19.841
Language Type	7.8	7.689	26	.000	2.502
Listening	4.8	.293	26	.000	.001
Motivating	7.8	5.068	26	.000	1.501
Reading	9.5	11.742	26	.000	4.002
Speaking	2.3	2.005	26	.058	.301
Subject & Content	10	12.045	26	.000	3.697
Validity	9	9.581	26	.000	3.152
Writing	6.9	2.982	26	.687	.231

One pattern t-test with a p-value of .051 revealed that, aside from speaking and listening skills, the other variables are noticeably different from and above their test values. This means that the academics' assessments of the books' elements are essentially accurate. With the significance of ($p = 0$), for the ability to speak and write. 058) and ($p = .687$) respectively, the results showed that the students' evaluations do not differ from the test pass rate; as a result, they do not maintain a healthy mindset regarding the value of the textbooks for those abilities.

5. Conclusion

A new educational tool for business professionals looking to advance their English communication abilities in the workplace is the Business English coursebook by John Taylor and Jeff Zeter, which is being used as the main text at the School of Technology in Darkhan-Uul, MUST. Each unit offers step-by-step instruction that immerses students in the four essential language components of reading, listening, speaking, and writing while incorporating career-specific vocabulary and contexts. With more than 500 vocabulary words and phrases, the series is divided into three difficulty levels. Every unit guides students through written and oral production while testing their listening, vocabulary, and reading comprehension. 25-course participants evaluated the textbook after the course by answering a series of questions to ensure its validity and quality. The results showed no discernible difference between the two textbooks, and students generally had favorable opinions of them. The ESP course's students had a positive attitude toward the books' physical appearance, their contents, topics, tasks, and activities. The absence of a theoretical component for speaking and writing, however, was perceived by students as the main weakness of both Business English books, despite their high positive grade averages. The application of appropriate materials in ESP courses and the evaluation of textbooks in related studies are two areas where we believe the findings of the present study have significant implications for material developers and teachers.

References

- [1] McGrath, I., (2002). Teachers' and learners' images for course books. <https://doi.org/10.1093>
- [2] Byrd, P., (2001). Textbooks: Evaluation for selection and analysis for implementation.
- [3] Tomlinson, B. (2003). Materials evaluation. In: Tomlinson, B. ed. Developing Materials for Language Teaching
- [4] Richards, J. C. (2001). The role of textbooks in a language program. Cambridge University Press
- [5] Litz, R. A. D., (2002). Textbook evaluation and ELT management: A South Korean Case Study.
- [6] Suvd-Erdene (2022) Needs analysis in engineering students' English language skills

SSOT-48

A professional study aimed at comprehending the factors and circumstances contributing to bullying and harassment within educational settings, along with strategies for effective resolution

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Summary: The purpose of this research is to clarify the cause and circumstances of peer bullying and discrimination in the school environment and provide possible solutions to these issues. Within this topic, we conducted a survey in February and March of 2023. We used a random sampling method among the 250 students in 7-12 grades from three different public schools in Baganuur district. We are living in a society of high technological advancement and we cannot raise or treat our children in the traditional ways. Our children's behavior, needs, and thinking are changing in response to these advancements. Through this research, we have learned that we shouldn't turn a blind eye to the ever-existing problem of peer bullying but rather take a scientific approach to understand the underlying causes, and influencing factors and determine possible consequences. The research has shown us the need for ongoing, step-by-step actions of change and impact in the school and family environments. We used the participatory research method to get the answers from the children's direct involvement in the survey. We aimed to find out answers to the following matters. Why the bullying is still existing? Whether the parents have an age-appropriate open conversation with their children, and whether they create a warm living environment at home. Whether the teachers and school staff treat the children as humans with respect and ethics, and not discriminate against them. Whether they encourage equal participation.

Keywords: Peer pressure, bullying, neglect, influence

1. Introduction

1.1 Background of the research:

Mongolia has joined SDG 2030 and is working toward reaching its 17 goals. Fighting against violence against children, peer pressure, and bullying will play an important part in reaching goals four, five, and ten. During our research on peer pressure and bullying some information on violence against children was revealed. We hear a lot of talk about how people got rid of bullying and discrimination when they moved from high school to university. It was the same twenty years ago, ten years ago and it is now. We needed to find out the reasons behind it. Is it a system problem? What is the true reason? 2021 statistics show that 81 percent of single-parent households are single-mother households. In Baganuur, there were 643 single-parent households of which 561 were single-mother households. There were 16,318 single-mother households in Ulaanbaatar. In 2021 the number of single mothers who had children under the age of 18 was

34,400 which in comparison to the previous year it decreased by 20 people. It is good that these numbers are decreasing, but the financial and social burden and the workload of single parents are leaving the children at risk. Teenagers are at risk to grow up in neglect, and without many opportunities, because their parent has to work overtime or has to work shifts in other cities or provinces (National Statistics 2022).

1.2 Purpose of the research:

To clarify the cause and conditions of peer pressure and bullying in the school environment and identify solutions.

1.3 Goals of the research:

1. Conduct a survey among the public school students of grades seven to twelve of the Baganuur district on bullying and clarify the cause and conditions.
2. Develop strategies to stop and solve the problem of peer bullying by conducting a group interview with the victim pupils and using the related research to provide advice and recommendations on what kind of initiatives the schools, teachers, and NGOs can do.
3. To contribute to the creation of an attitude that everyone's involvement is important in the prevention of bullying, harassment, and violence through the cooperation of parents, guardians, teachers, employees, and management in the education and upbringing of the children.

2. Previous researches

The combined research by the Ministry of Education and the education department of the Government implementing agency that included 4264 children of 12-18 years old living in nine districts of Ulaanbaatar and eight province centers revealed that 82,8 percent of these children have been a victim of bullying and violence. In other words, eight out of ten children experience some kind of violence, including physical abuse. It mostly occurs in the home or school environment. The survey shows that the school environment is not a child-friendly place because the results show that the main harassers in the school environment are older graders (47,6%) and teachers (15%).

Also, the survey by the Mongol-Family Psychological Institute from 1860 children from 20 schools of Ulaanbaatar shows that 54 percent of these children had serious psychological problems. 35 percent have experienced peer pressure. Peer pressure occurs at school and in the social network environment. Joint research (2017) by WHO and the Ministry of Health observed that the major reason for death in youth between 15 to 29 years is suicide. It is also stated in the 2021 report of the State of the World Children (UNICEF) that 45,800 teenagers commit suicide annually. Suicide is listed as fifth among the most common reasons for death in 10 to 19 year-old children. Peer bullying is one of the major causes of suicide.

2.1 The benefit of the research:

To reveal the fundamental reasons for peer pressure and bullying. Develop partnerships with district schools, take actions of influence, to provide advice and recommendations.

2.2 Research hypothesis:

1. The following reasons contribute to the existence of peer bullying among school pupils. Those are weak parental supervision, the family atmosphere is not warm, the school does not provide equal participation, school governance is not open, and teachers and staff put pressure on the pupils with their own set ideas and understandings.

2.3 Scope of the research: 250 students from the public school.

2.4 Main part:

According to the Convention on the Rights of the Children, everyone under the age of 18 is considered a child. The rights and freedom that children should have and the set of care and services that should be provided by parents and the government to the child are altogether called child rights. The teenage

year is a period of time when the child's body, mind, and ethics develop and change, so this period is called the transition age.

During this period children's character and emotions change, they strive to be known and to be independent and attracted to novelties which often lead them to negative experiences. They tend to copy their peers, instead of accepting differences in other people they tend to discriminate and bully. Predominant actions of bullying are physical, outward appearance, discrimination, non-verbal, verbal, demanding money, and taking personal belongings.

3. Research Methodology

We did our survey in a stationed form and used five sets of questionnaires. The aim was to find out by group and individual interviews whether there is peer pressure, bullying, and discrimination and to find out possible negative outcomes for the victims. The stations were organized to get answers from every child with questions about who, where, when, how, and why. We randomly selected 250 students of grades seven to twelve from three state-owned schools. 45 percent of the participants were boys, and 55 percent were girls.

4. Research

Baganuur district is located 135 km away from the Capital. This district has three state-owned schools and one private school. The research was done among 250 students of 7-12 grades from three state-owned schools. Between 2020 and 2023 calls on peer bullying have been registered but there are no official statistics recorded in the Family, Child and Youth Development agency and the Police Department of Baganuur. We surveyed 250 students of grades seven to twelve from three state-owned schools to find out the cause and conditions, and solutions for peer pressure and bullying. We used five questions to interview students in a group or individual setting. 45 percent of the participants were boys, and 55 percent were girls.

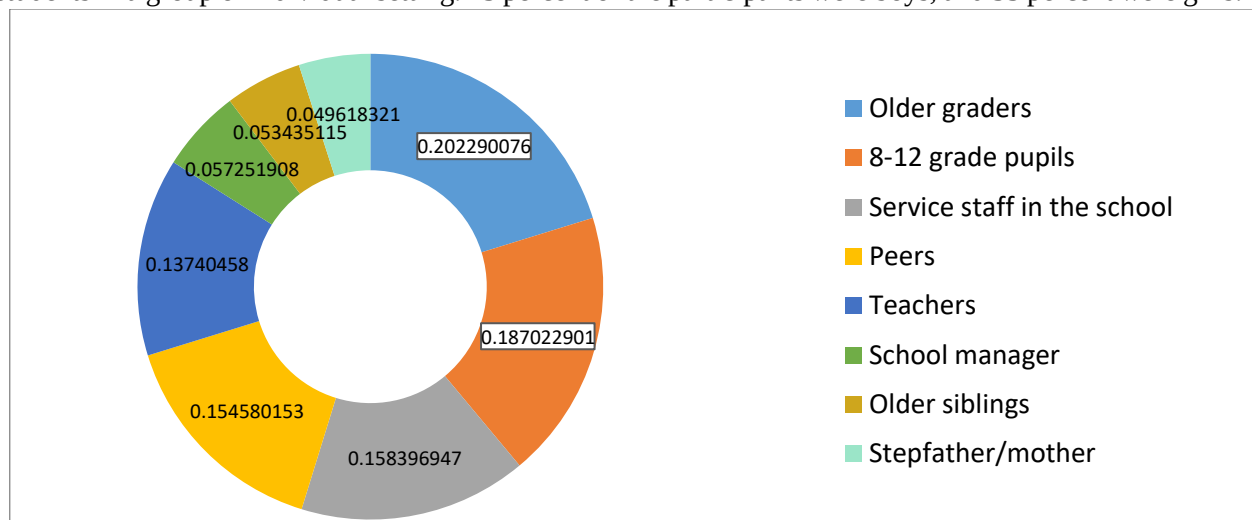


Figure 1. Who is mostly pressuring and bullying?

The above survey has shown us that the majority of the participants, which is 20.2% have expressed that bullying is done by older graders, 18.7% expressed that bullying is done by eight to twelve graders, and 29.7% expressed that it is done by adults. It has become obvious that besides peer pressure and bullying, there is pressure and bullying from adults too.

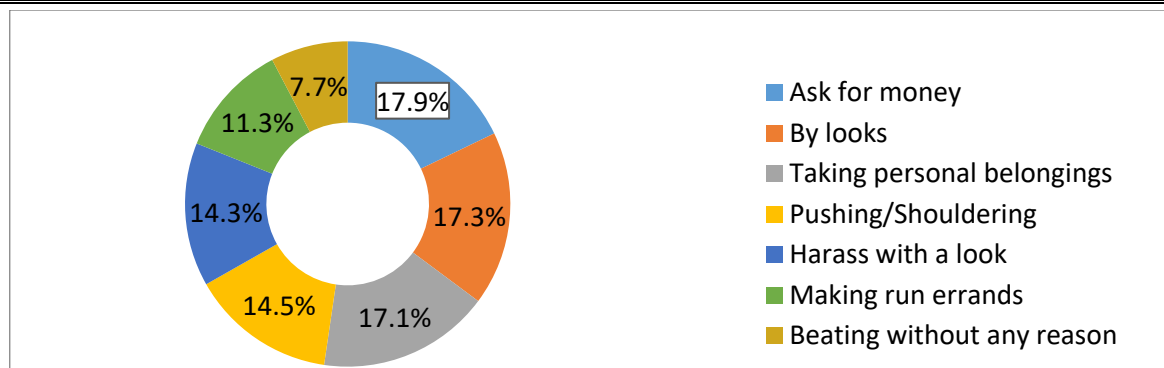


Figure 2. What kinds of pressure and bullying are there?

30.9% of the participants expressed that they were asked for money, and 20% said that they were called names. We can see that calling names and asking for money is a common type of bullying in the school environment.

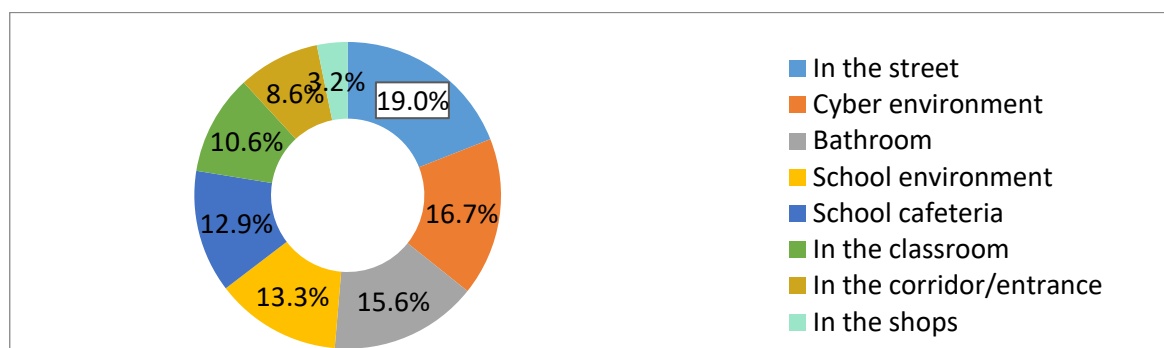


Figure 3. Where the pressuring and bullying are done?

Since the Covid-19 pandemic started schools transitioned to online classes. In relation to this cyberbullying started taking place. Especially if the student loses his/her phone or account password others would take advantage of it and do the cyberbullying against the person. Besides this 13-17% have said that traditional bullying such as bullying in the restrooms and streets still exists.

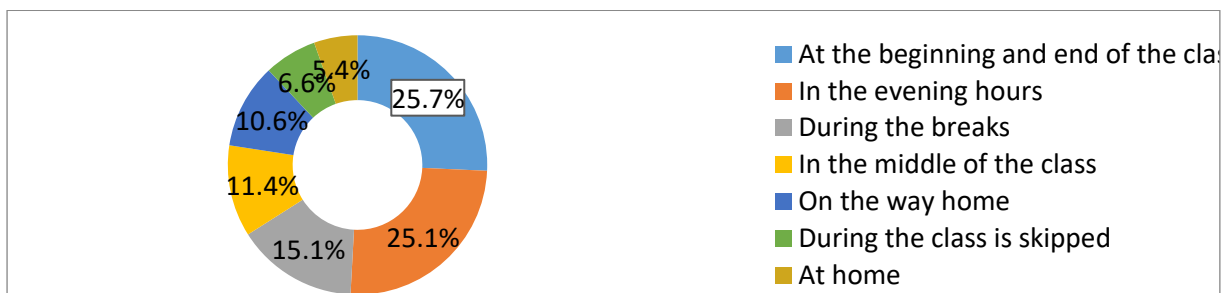


Figure 4. When are the pressuring and bullying done?

25.7% said there is bullying before and after classes, 25.1% said it happens in the evening hours, and 15.1% during the class breaks or in the class. From here we can see that there is pressure and bullying in the school environment. 5.4% have expressed that they are bullied at home from which we can see that parents and guardians are committing the act of bullying too.

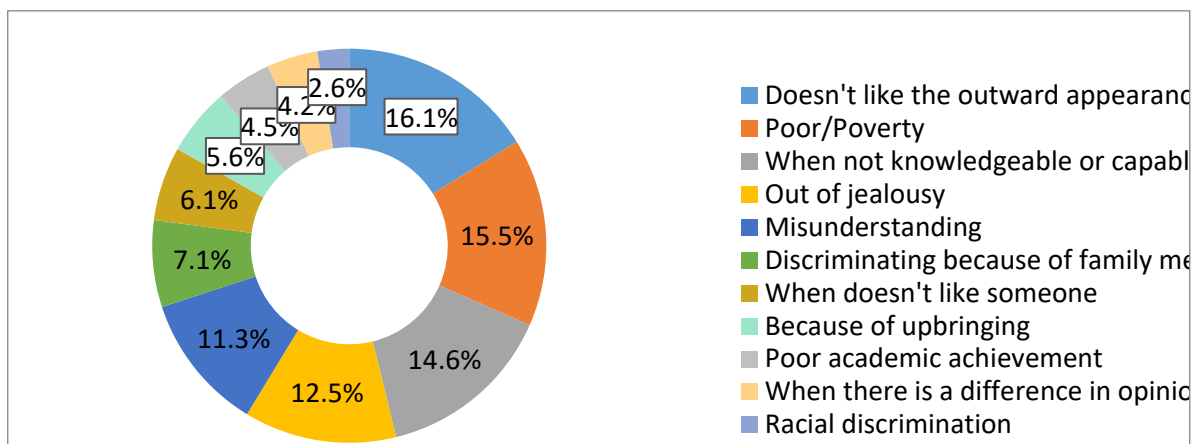


Figure 5. Why the pressuring and bullying are done (motivation)?

From here we can see that harasser's maturity, family environment, perspectives, and upbringing are closely related to the issue of bullying. 16.1% of the participants said that bullying and pressure are done due to outward appearance, and 15.5% expressed that it is done due to the poor living situation of the victims. We can see that the financial situation of the family and the social status of the parents or guardians is used against the victims. There is no human rights understanding among the students. They are not capable of accepting other people's differences and end up discriminating against others. The way how teachers announce poor children in front of the class to pass the humanitarian aid is adding fuel to the current issue.

5. Conclusion

It has become obvious to us that besides peer pressure bullying is done by older graders and adults. Children raised by single parents are vulnerable to becoming victims of peer bullying due to the lack of care from the family members. We can observe a "strongest versus the weak" pattern has already been established in the school environment.

We need to reveal the root issues of why children and adults bully others in the school environment. We also need to take continuous action against this matter. We need to promote a variety of club activities to provide equal involvement for the students. And these activities promote positive upbringing methods and provide knowledge about human rights. Child protection teams of the schools need to be active regularly and work according to their purpose. A student who has been harassed or bullied needs to know where to go for protection. By improving the cooperation of the related entities of child protection law we can help the children become citizens who have confidence and a character that respects others.

The research has shown us that the poor attention of the parents, and the financial situation of the families is contributing reason for peer bullying. We need to work together with the school's parent committees and raise this issue and provide continuous training and works of influence. We also can develop content to prevent bullying and distribute them through schools and social platforms that students use. Also promoting warmth and open conversations in the families, and actively involving parents can be helpful.

It is very common for a child who was brought up in a violent environment to pressure and bully others. They do this to get attention and love by force. That is why we need to give this kind of understanding and knowledge to the parents and guardians.

Recommendations

- To provide age-appropriate understanding and knowledge about human rights, human dignity, and gender to the students. And provide equal participation in whatever activities are held in the school environment.
- Provide the teachers and workers with methods that have a sense of child rights and human rights. Use positive upbringing techniques. Change the common understanding that peer bullying is normal.
- Provide knowledge and understanding to parents and guardians about domestic abuse and violence against a child through class meetings and other activities of the school.
- Make the school open and friendly that cherishes and respects child rights and child dignity by doing: make the child protection policy known to every teacher and staff; cooperate with NGOs that provide skill and knowledge training and sharing expertise.

References

- [1]. Compilation of laws and legal documents related to family, child protection, and children's rights Ulaanbaatar, 2019.
- [2]. Textbook of Theories and Methods of youth violence prevention 2023
- [3]. Child protection system mapping study report 2021
- [4]. B. Javzan, B. Enkhbayar "Psychology of education" Ulaanbaatar, 2009
- [5]. <https://mongolia.un.org/mn/sdgs>
- [6]. <https://gogo.mn/r/3nomk>

SSBA-50

Some issues of waste management in Mongolia

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Abstract: The current context of waste management in Mongolia can be described by 3 main stages: collection, treatment, and disposal of waste. A small portion, approximately 10%, of the total waste generated is currently being properly managed and disposed of by waste collection services and private waste management companies, where it undergoes treatment and is recycled into new products. Total waste generated in the country is 3.353.548.73 tons. Of these, 41.6 percent occurred in Ulaanbaatar, and the remaining 58.4 percent were recorded in rural areas. These wastes are concentrated in 3 central and 3 outlying districts of Ulaanbaatar city, and the final disposal activities are carried out. The implementation of the 3R (Reduce, Reuse, Recycle) approach in Mongolia is currently underway. It is often referred to as the initial stage of waste management. The objective of the study is to enhance the understanding of the concepts of 3R and 5R (including Respect, Responsibility, Reduce, Reuse, Recycle) management among individuals and develop practical models to illustrate their application. The goal of these efforts is to establish a sustainable waste management system that promotes responsible consumption, minimizes waste generation, and maximizes resource efficiency. By implementing the 3R and 5R concepts, Mongolia aims to reduce the environmental and social impacts of waste and contribute to a more sustainable future. To waste management challenges, various long-term projects and initiatives are being implemented to promote responsible waste disposal practices and introduce innovative technologies that are environmentally friendly and sustainable. The involvement of individuals in waste management is crucial, as they play a significant role in creating waste and can actively contribute to its reduction and proper management.

Keywords: waste, waste management, reduce, reuse, recycle, impact

SSBA-51

The Effect of Senior Entrepreneurs' Entrepreneurial Competence on Program Participation Intention: Mediating Effect of Entrepreneurship Intention

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Abstract: The purpose of this study is to analyze the causal relationship between them by constructing a research model that can contribute academically and practically after discovering the key factors of entrepreneurship. The specific purpose of this study is presented as follows. First, through theoretical considerations on senior entrepreneurs, previous studies on entrepreneurship capabilities, entrepreneurial intentions, and participation in entrepreneurship education programs are reviewed in detail to present definitions and concepts. Second, in order to verify the hypotheses of this study, the mediating effect of entrepreneurial competency and entrepreneurial intention, entrepreneurial intention and willingness to participate in entrepreneurship education programs and entrepreneurial intention was verified. The specific research methods of this study are as follows. First, a frequency analysis was conducted to confirm the general characteristics of senior entrepreneurs and the characteristics of the sample. Second, reliability analysis and exploratory factor analysis were conducted to confirm the reliability and validity of the items. In addition, a correlation analysis was conducted to confirm the validity of the items. Third, multiple regression analysis and simple regression analysis were conducted to verify the hypotheses of the study. Finally, mediation analysis was conducted to verify the mediating effect of entrepreneurial intention. The results of the empirical analysis are as follows. First, all three hypotheses that entrepreneurial competency has a significant effect on entrepreneurial intention were accepted. Second, entrepreneurship competency was found to have a partial effect on the willingness to participate in the entrepreneurship program. Third, the hypothesis that the intention to start a business has a significant effect on the intention to participate in the program was accepted. Fourth, as a result of the mediating effect of entrepreneurial intention, it was found to be partially effective.

Key words Senior Entrepreneurs, Entrepreneurial Competence, Program Participation Intention, Entrepreneurship Intention

SSEC-52

Tourism and Economic Growth Relationship in Southeast Asia:

Panel Data Analysis

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Abstract: Southeast Asia is a collection of interconnected but distinct states sandwiched between the Indian Ocean and the Pacific Ocean. The Association of Southeast Asian Nations (ASEAN) is one of the best-performing regions in the world in terms of economic growth. The tourism sector is one of the sources of economic growth in the ASEAN region. Tourism is an important driver of economic growth in all ASEAN member countries and is a strategic sector for economic growth. In other words, tourism is the main economic sector that affects the society and culture of this region. Therefore, the number of tourists coming to the destination is increasing day by day, and it is intended to confirm the impact on the economy and employment as well as the education sector. The study was conducted between 1995 and 2021 in 11 Southeast Asian countries (Brunei, Myanmar, Cambodia, Timor-Leste, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam) and per capita gross domestic product and international travel. the factors influencing the growth of tourism income will be investigated and the variables that will increase economic growth and tourism will be identified. Based on the data of 11 Southeast Asian countries, empirical analysis through Stata17 was carried out for results 1 and 2 respectively. In result 1, international tourism, the number of arrivals, development, employment, international tourism income and export have a positive (+) effect on economic growth, while foreign direct investment has no effect in Southeast Asia. approved. In result 2, the study shows that education and GDP per capita have a positive (+) effect on international tourism income indicators, while political stability is not related to tourism income.

Keywords: Southeast Asian countries, economic growth, tourism, panel analysis, fixed effects, random effects

SSBA-56

Social impact assessing of entrepreneurs in Ulaanbaatar and aimags

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Abstract In modern time, the behavior of the customer has been changed enormously. Moreover, farming and business innovations has been evolved with the help of new technologies. For example, startup businesses are making quite a lot effort to turn the business ideas into real businesses. Small, medium and big business economic entities have faced the necessities to adopt new technologies, extend their businesses and update the business management in order to compete in different market. Business entrepreneurs in Mongolia are striving for the gaining the modern orientations to manage businesses and change their method of industry, service and business administration. Although they are learning the problems faced with the customers and seeking for ways to solve them, social and governmental systems to support business entrepreneurs is inefficient. Entrepreneurship is defined as the process of creating economic value by business entrepreneurs. The purpose of this research is to estimate the social and economic contribution of business entrepreneurs by the customers and clients in Ulaanbaatar and rural area through entrepreneurship orientation, social innovation, service innovation and social value. The questionnaire was developed based on the study of the researchers' entrepreneurial orientation, social and service innovation, social value orientation, and their relationship. Samples were collected from clients and customers of provinces, Sum, Bag, rural areas, and Ulaanbaatar, and calculations were performed using SPSSv26 software. Through mediating variables, there was a "positive and strong correlation" between dependent and independent variables. This study has theoretical and practical implications and can be studied further.

keywords: Entrepreneurial orientation, social innovation, service innovation, social value orientation, нийгмийн үр нөлөө /social impact/

1. Introduction

As of the end of 2022, 67 percent of 3,409,939 people in Mongolia are living in the capital city of Ulaanbaatar. About 70% of the enterprises and institutions are located there, producing more than 70% of the GDP. Not only entrepreneurs of large companies, but also micro, small, and medium-sized entrepreneurs continue to lead development, offer new products and services, develop products, and

create innovative national brands. is. For example, the production of Mozzarella Gouda cheese by the European technology of "Suun Zam Dairy" LLC brought Italian cheese to Mongolia and by 2022, it is producing 10% of the domestic mozzarella cheese demand, i.e. 65 tons per year, and successfully reduced 10% of imported cheese.

Mongolia is an agricultural country. By the end of 2021, there are 98,025 dairy cows in 3,035 households and farms, 34,963 beef cattle in 341 farms, and 28 enterprises. The rising number of milk processing plants and intensive farmers in order to replace imports by the government of Mongolia using local milk resources, and to produce export-oriented products, demonstrates that the knowledge and skills of entrepreneurs in Mongolia have improved in managing their farms independently. For example, a model farmer of 40 cows of the European standard mechanized milking Monbelaryad breed was established in Saikhan sum Nomgon 3rd team of Selenge province. The fact that thoroughbred cows suitable for Mongolia's natural and climatic conditions are crossbred with local cows to increase their productivity and produce ecologically pure milk of world-recognized quality, on average, 9 liters of milk from 1 cow, verifies the creative ideas and thinking of Mongolian entrepreneurs. New service businesses are flourishing, one example of which is Monpay, Mongolia's first licensed national electronic payment tool certified by the Bank of Mongolia. Moreover, not only have many new businesses emerged, but some tech startups have also begun to compete in foreign markets. Furthermore, domestic social entrepreneurs have also started gaining strength. They create social and economic value by leading with their intelligence, talent and expertise for the benefit of society. In particular, businesses that contribute to the welfare of society by engaging in production such as bone processing factories and paper recycling can be highlighted. Small and medium-sized enterprises and service entrepreneurs have illustrated their ability to compete in the market with high productivity and flexible production technology, despite their small workforce and production scale. Although the export of products produced by small and medium-sized manufacturing and service businesses accounts for 2.4 percent of the total export of goods, by commodity group, processed leather accounted for 72.6 percent of exports in 2021, oilseeds or rapeseed accounted for 94.7 percent, and animal wool and cashmere exports accounted for 35.1 percent and meat, livestock, and other animal products account for 27.8 percent which proves that they continue to contribute to the society and economy on a par with the entrepreneurs of large companies. In this sense, the ability to take business risks and overcome them is learned. This study aims to assess the social and economic contribution of entrepreneurs in Ulaanbaatar city, local consumers and customers through entrepreneurship orientation, social innovation, service innovation, and social value. The questionnaire was developed from the study of the researchers' entrepreneurial orientation, social and service innovation, social value orientation, and their relationship. The sample was collected from users and customers of provinces, sums, bags, rural areas and Ulaanbaatar city, and calculations were performed using SPSS v26 software. The results showed that dependent and independent variables are "positively and strongly correlated". The study has theoretical and practical implications and can be further explored.

2. Literature review

In this part, entrepreneurial orientation, service innovation, social innovation dimension, social value orientation and social impacts studies are studied.

2.1 Entrepreneurial orientation dimension

Numerous prior studies have been confirmed that EO is significant factor and it's much importance for all type of firms in broad (Acar, Zehir, Ozgenel & Ozsahin, 2013). Especially, entrepreneurs must be entrepreneurial such as risk taker. in entrepreneurship literature, entrepreneurial orientation has been

positively associated with firm-level performance (Covin & Slevin, 1991; Zahra & Covin, 1995; Lumpkin & Dess, 1996). Clearly, the key dimensions that characterize an EO include the propensity to act autonomously, the willingness to innovative and the taking risk, and the tendency to be aggressive toward competitors and proactive relative to marketplace opportunities (Lumpkin & Dess, 1996). The concept of entrepreneurial orientation was developed by Miller (1983) as comprising three dimensions; innovativeness, pro-activeness and risk taking. However, Miller (1983) argued that these three components of EO comprised a basic unidimensional strategic orientation. Entrepreneurial orientation construction studies are discussed in table 1.

Table 1. Constructs of the EO dimension

Constructs	Scholars	Issue	Content of issue
Autonomy (AUT)	Bourgeois & Brodwin (1984)	A creative model within the organization via individual entrepreneurship.	The model suggests that the impetus for new ventures often occurs at lower levels in an organization and reflect the importance of autonomy to organization members who might be found in an internal corporate venture setting.
	Lumpkin & Dess (1996)	The linking of EO construct to performance	Autonomy refers to the independent action of an individual or a team in bringing forth an idea or vision and carrying it through to completion. It means the ability and will to be self-directed in the pursuit of opportunities.
	Frese, Brantjes & Hoorn (2002)	The Roles of Strategy Process, EO and the Environment.	Firms enjoy rapid and self-reliant decisions to perform in new markets with new products or services through autonomous orientation.
	Uddin et al., (2015)	Relationship between EO and performance of business	Model finds autonomy (b=0.2642) is negatively related with the business performance and this relation is statistically significant. Business organizations should not exercise autonomy to a greater extent which may bring the performance down.
Innovativeness (INN)	Cooper (1971)	Technological innovativeness	Technological innovativeness, which consists primarily of product and process development, engineering and research emphasizing technical expertise and industry knowledge.
	Mintzberg (1973)	Strategy making in three modes	Innovativeness is the firm's ability and willingness to support creativity, new ideas

Constructs	Scholars	Issue	Content of issue
Risk Taking (RT)	Miller (1983)	Three types of firms in entrepreneurship	and experimentation which may result in new products/services. With the growth and complexification of organizations, there is continually a need for organizational renewal, innovation, constructive risk-taking, and the conceptualization and pursuit of new opportunities, a pursuit that often goes beyond the efforts of one key manager.
	Lumpkin & Dess (1996)	The linking of EO construct to performance	Innovativeness is embodied by a strong organizational commitment to “engage in and support new ideas, novelty, experimentation, and creative processes that may findings in new products, services or technological processes.
	Alarape (2013)	Relationship between EO and the growth performance of SMEs in Southwestern Nigeria	EO’s dimensional variable of innovativeness is positively correlated to the overall EO of the firm.
	Kreiser & Davis (2010)	Relationship between EO the unique impact of innovativeness, pro-activeness, and risk-taking of EO and firm performance.	This study examined the potential performance ramifications of different configurations of entrepreneurial orientation and organizational structure and provide a model specifying these configurations.
	Covin & Slevin (1991)	A conceptual model of entrepreneurship as firm’s behavior & Entrepreneurial posture	Innovativeness: R&D Leadership, New Product Lines. Authors described entrepreneurship as dimension of strategic posture represented by firm’s risk-taking propensity, tendency to act in competitively aggressive, proactive manners, and reliance on frequent and extensive product innovation.
	Lumpkin & Dess (1996, 2001)	The linking of EO construct to performance Linking two dimensions of EO to firm performance	Early research on entrepreneurial orientation posited that entrepreneurial firms tended to take more risks than other types of firms,

Constructs	Scholars	Issue	Content of issue
Pro-activeness (PROAC)	Miller & Friesen (1982)	Innovation in conservative and entrepreneurial firms	especially when faced with conditions of uncertainty. Relating to risk-taking, it is the firm knowingly devoting resources to projects with chance of high returns but may also entail a possibility of high failure.
	Uddin et al., (2015)	Relationship between EO and performance of business in Khulna City, Bangladesh.	According to this model, risk-taking behavior ($b=0.5326$) is the most important variable.
	Kuratko & Hodgetts (2001)	A contemporary approach of entrepreneurship	Risk-taking is also commonly associated with entrepreneurial behavior and that generally successful entrepreneurs are risk-takers.
	Alarape (2013)	Relationship between EO and the growth performance of SMEs in Southwestern Nigeria	Hypothesized that EO's dimensional variable of risk-taking, is positively correlated to the overall EO of the firm.
	Kreiser & Davis (2010)	Relationship between the unique impact of innovativeness, pro-activeness, and risk-taking of EO and Firm Performance	The study based on Miller and Friesen's definition and examined of entrepreneurial orientation as risk-taking, risk-taking proclivity and environmental Boldness and organizational structure and provide a model specifying these configurations.
	Lumpkin & Dess (1996)	The linking of EO construct to performance	Pro-activeness is the pursuit of opportunities and competitive rivalry in anticipation of future demand to create change and shape the business environment.
	Lumpkin & Dess (2001)	Linking two dimensions of EO to firm performance.	Initial tests found that pro-activeness was positively related to performance A strong proactive tendency enables a firm with the ability to foresee changes of the markets and the needs of customers.
	Miller (1983)	The correlates of entrepreneurship in three types of firms	The literature shown entrepreneurship to be a multidimensional concept comprising three dimensions: innovation, pro-activeness, and risk taking.
	Bateman & Crant (1993)	The proactive component of organizational behavior: A measure and correlates	Introduced the proactive disposition as a construct that identifies differences among

Constructs	Scholars	Issue	Content of issue
Competitive aggressiveness (CA)	Zimmerman & Brouthers (2012)	Relationship between gender heterogeneity, EO and international diversification.	people in the extent to which they take action to influence their environments. Results indicated that top management team gender composition and entrepreneurial orientation are significantly related to international diversification but that ownership gender composition is not. The authors found that team entrepreneurial orientation may be useful when teams are more homogeneous on relations-oriented characteristics such as gender.
	Uddin et al., (2015)	Relationship between EO and performance of business in Khulna City, Bangladesh	Pro-activeness ($b = 0.0408$) is found to be negatively related with the business performance although the relation is very weak and statistically insignificant thus the variable is unlikely to affect the performance.
	Alarape (2013)	Entrepreneurial orientation and the growth performance of small and medium enterprises in Southwestern Nigeria", Journal of Small Business & Entrepreneurship	EO's dimensional variable of pro-activeness is positively correlated to the overall EO of the firm.
	Kreiser & Davis (2010)	Relationship between Firm Performance The Unique impact of Innovativeness, Pro-activeness, and Risk-taking of EO.	Propositions are developed regarding the various configurations of the sub-dimensions of EO and organizational structure that would be most appropriate in a given environmental context.
	Lumpkin & Dess (1996)	EO construct and linking it to performance	In dynamic environments, characterized by rapid change and uncertainty, proactive firms had higher performance relative to competitively aggressive firms. In hostile environments, where competition is intense and resources are constrained, competitively aggressive firms had stronger performance.
	Lumpkin & Dess (2001)	Linking two dimensions of EO to firm performance	Firm exhibit that high level of competitive aggression will have the capabilities to change the rules of competition, redefine industry
	Uddin et al., (2015)	Relationship between EO and performance of business in Khulna City, Bangladesh	

Constructs	Scholars	Issue	Content of issue
			borders, achieve entry advantage, and improve marketplace position.

Source: Lumpkin & Dess (1996)

2.2 Social innovation

Innovation varies in terms of products, services, processes and business practices (Christopherson, Kitson & Michie, 2008). Much of what people now take for granted in social life began as radical innovation. Important term of innovation is social innovation, it is more relatively new term in innovation for time and scholars, researchers, and policy-makers have discussed social innovation's programme and project and it's mainly about growing of social innovation and result under early a few theoretical studies only in Europe and north America Caulier-Grice et al., (2012) Table 2 shown summarize of social innovation dimension.

Table 2. Summarized literature of social innovation

Scholars	Issue	Content of issue
Moulart, Martinell & Swyngedouw (2005)	Alternative model of local innovation	'Product' dimension of social innovation, which they define as the provision of public services and other redistributive measures, is re-emerging as a significant issue as a result of current austerity measures and moves towards the retrenchment of the welfare state. As well, authors argue that the technological focus of innovation policy and an overly technocratic approach to urban planning led to support for social innovation as a theme in the theorizing of human development, empowerment and local development strategies. Empowerment dimension (power relation) the improvement of social political capability and access to resources necessary to trigger the right to satisfaction of human needs and to participation.
Goldenberg (2004a); Tanimoto & Doi (2007); Neamtan (2003)	Social innovation in Canada Social innovation cluster in action Non-profit sector and evaluation	Social innovation is defined as the development and application of new or improved activities, initiatives, services, processes and application & development of goods designed to address social and economic challenges faced by individuals and communities.
Milbergs & Vonortas (2004)	Innovation Metrics: Measurement to Insight.	Indicators of systemic environment, of the process of innovation, and of the intangible aspects of innovations.
Mulgan (2006)	The Process of Social Innovation	Social innovation refers to innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organizations whose primary purposes are social.
Mulgan (2007)	How social innovation can be accelerated?	Social innovations are new solutions (products, services, models, processes etc,) that simultaneously meet a social need and manage to new or advanced capabilities and relationships

Scholars	Issue	Content of issue
		and better use of assets and resources (Mulgan, 2006).
Phills, Deiglmeier & Miller (2008)	Rediscovering social innovation	To defined social innovation as “a novel solution to a social problem that is more effective, efficient, sustainable or just than current solutions, and for which the value created accrues primarily to society as a whole rather than private individuals.
Howaldt & Schwarz (2010)	Concepts, research fields and international trends in Social innovation	Introduce a new innovation paradigm and suggest that a new type of innovation has emerged as social innovation. The author noted that it depended on quality of life, a sustainable development and a demographic change in whole world.
Hubert (2010); BEPA (2010)	Empowering people, and driving change	Social innovations are innovations that are social in both their ends and their means. Specifically, they define social innovations as new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and
Mulgan (2012)	The Theoretical Foundations of Social Innovations	Mulgan (2012) summarized that this approach of social innovation highlights the critical role played by the ‘connectors’ in any innovation system – the brokers, entrepreneurs and institutions that link together people, ideas, money and power who contribute as much to lasting change as thinkers, creators, designers, activists and community groups.
Murray, Caulier-Grice & Mulgan (2010)	Ways to design and develop and grow social innovation	Social innovation seeks new answers to social problems by identifying and delivering new services that advance the quality of life of individuals and communities; identifying and implementing new labor market integration processes, new competencies, new jobs, and new forms of participation, as diverse elements that each contribute to improving the position of individuals in the workforce both as producers and consumers.
Nicholls & Murdock (2012)	The Nature of Social Innovation	Research found that research on social innovation tends to focus on ‘systems and processes of change in social relations’ on the one hand and ‘innovation in the conceptualization, design and production of goods and services that address social and environmental needs and market failures on the other.
(Caulier-Grice et al, 2012) Under FP7-project; TEPSIE review, 2012)	Defining Social Innovation	New products, new services, new processes, new markets, new platforms, new organizational forms and new business models. From TEPSIE review (2012), however, social innovation is possible to dismantle these two uses and identify

Scholars	Issue	Content of issue
		three further uses of the term. Broadly, the term social innovation has been used to describe: Societal transformation, a model of organizational management, Social entrepreneurship, the development of new products, services and programs and a model of governance, empowerment and capacity building.
Borzaga & Bodini (2012)	Social Innovation's feature and impact	The notion of social innovation is appealing in light of the difficulties facing traditional welfare systems and, more broadly, a development model based essentially on only two actors (the market and the state) that is finding it increasingly difficult to meet the growing and diversified needs of society.
Lisetchi & Brancu (2014)	The entrepreneurship concept as a subject of Social innovation	This paper adopted Mulgan's (2006) definition. The process is defined in terms of its motives (social need), outcomes (activities or services), and area of change (organizations whose primary purposes are social). While this definition best represents the pragmatic approach (Bassi, 2011) its text is complementing the previously mentioned general definition of innovation, given by Baregheh et al. (2009).

2.3 Entrepreneurs and service innovation

The analysis of services and services innovation has progressed quite remarkably the last decade. Although the attention given to services by researchers grew from the 1970s on, they were long discounted in terms of technological innovation (De Hertog & Bilderbeek 1999). (De Hertog and Bilderbeek (1999) aim at contributing to a better insight into the: dimensions that are relevant when discussing innovative activities in services. Service innovation dimensions are summarized in table 3.

Table. 3 Summarized dimension of service innovation (SeIn)

Dimension	Scholars	Issue	Content of issue
New service concept (NSC)	De Hertog & Bilderbeek (1999)	Conceptualizing Service Innovation	New service concept consists knowledge of the characteristics of existing and competing services (business intelligence).
New client interface (NCI)	De Hertog & Bilderbeek (1999)	Conceptualizing Service Innovation	A second element of service innovations is the design of the interface between the service provider and its clients. New client interface's feature is characteristics of actual and potential clients (market intelligence). The way the service provider interacts with the client can be a source of innovation.
New service delivery (NSD)	De Hertog & Bilderbeek (1999)	Conceptualizing Service Innovation	It refers to the internal organizational arrangements that have to be managed to allow

Dimension	Scholars	Issue	Content of issue
Technological options (TOs)	De Hertog & Bilderbeek (1999)		service workers to perform a firm's job properly, and to develop and offer innovative services. On the one hand, new services may require new organizational forms, (inter)personal capabilities, and skills. Concerning the degree to which service firms themselves in practice are giving shape to technology development. In practice there is a wide range of relationships between 'technology' and 'service innovation', varying from technology mainly playing a role as a facilitating or enabling factor, to something much closer to supply-push, technology-driven innovation.

2.4 Social value orientation of entrepreneurs

First time Au and Kwong (2004) summarized about social value orientation and its measurement. As these notion, social value orientation (SVO), it has been known as social value (McClintock & van Averaet, 1982); motivational orientation (Messick & McClintock, 1968), and social motivation (McClintock, 1976), social motivation is perhaps the most studied individual differences variable in social dilemmas. These early studies defined that SVO is a goal or motivation that influences, if not determines, behaviors of actors whose outcomes are interdependent. Whereas, when people seek to maximize their gains, they are said to be pro-self. Social value orientation dimensions are summarized in table 4.

Table 4. Social value orientation (SVO)

Dimension	Scholars	Issue	Content of issue
Prosocial (cooperative) (PRO)	Messick & McClintock (1968)	Motivational bases of choice in experimental games	The concept refers to preferences for particular patterns of outcomes for the self and others and focuses on a three-category typology of (a) cooperation (i.e., maximizing outcomes for the self and others)
	Van Lange & Visser (1999)	An integrative model of social value orientation	Here, a cooperator would choose Option A, as it maximizes joint gain and equality. A competitor would choose Option C, as it maximizes one's relative advantage over the other person.
	Nauta et al (2002)	Social value orientation, organizational goal concerns and interdepartmental	Suggested that problem-solving can be induced by selecting or developing prosocial employees, because prosocial orientation increases the likelihood of having broad role orientation, in which

		problem-solving behavior	employees not only care for goals characteristic of their own department, but also for goals of other departments. Findings have indicated that people with a prosocial orientation tend to view their interacting partners as having heterogeneous social motives, whereas people with a proself orientation tend to believe all people are alike and selfish.
	Declerck & Bogaert (2008)	Empathy and the ability to Read the Mind in the Eyes	
	Murphy et al (2011)	Measuring Social Value Orientation	The percentage of individuals that were assigned to each of the different SVO categories by the different measurement methods, ordered by experimental session. Across all measurement methods there is a clear majority type, namely prosocial, occurring about 59% of the time.
	Messick & McClintock (1968)	Motivational bases of choice in experimental games	(b) Individualism (i.e., maximizing outcomes for the self with little or no regard for others' outcomes).
Individualistic (IND)	Van Lange (1999);	The pursuit of joint outcomes and equality in outcomes	An individualist would choose Option B, as it maximizes own gain.
	Declerck & Bogaert (2008)	Empathy and the ability to Read the Mind in the Eyes	Findings have indicated that people with a prosocial orientation tend to view their interacting partners as having heterogeneous social motives, whereas people with a proself orientation tend to believe all people are alike and selfish.
	Nauta et al (2002)	Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior	Individualists maximize outcome to self with little or no regard for the outcome to the other.
	Murphy et al (2011) Messick & McClintock (1968)	Measuring Social Value Orientation Motivational bases of choice in experimental games	Individualist is less common, but found about 35% of the time. (c) competition (i.e., maximizing relative advantage over others' outcomes
Competitive (Co)	Van Lange (1999)	The pursuit of joint outcomes and equality in outcomes: An integrative model of social value orientation	A competitor would choose Option C, as it maximizes one's relative advantage over the other person.

Altruism (Alt)	Nauta et al (2002)	Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior	Competitors maximize the difference in outcomes to self and the other (i.e., the relative advantage)
	Murphy et al (2011)	Measuring Social Value Orientation	Competitive and unclassifiable types complete the remainder of the sample representing about 3-4% each.
	Forsyth (2006); Murphy et al (2011)	Measuring Social Value Orientation	Unclassifiable types complete the remainder of the sample representing about 3-4% each.

2.5 Social impact

There is no one definition of the term or concept, but when people talk about ‘social impact measurement’ they are talking about understanding the effects on various people that happen as a result of an action, activity, project, programme or policy. The ‘impact’ of this action or activity can be positive or negative, and can be intended or unintended, or a combination of all of these. Social impact definitions are summarized in table 5.

Table 5. Social impact of entrepreneurs

Scholars	Content of issue	Social impact	Industry
Lumpkin & Dess (1996)	According to firm's EO if firm have entrepreneurial activity and process, also if managers/owners are high entrepreneurial orientation, they can distribute entrepreneurial culture to society.	Entrepreneurial culture to society.	Any industrial firm
Lumpkin & Dess (1996); Matsuno et al., (2002)	In general, EO refers to firms' proclivity to explore new market opportunities and as such, it manifests itself through a firm's tendency to accept innovativeness, risk-taking, pro-activeness, competitive aggressiveness and autonomy.	new market opportunities	Any industrial firm
Wiklund & Shepherd (2003)	This paper suggested that future opportunities can be discovered by combining an EO with knowledge management. When this combination can be effectively maintained by organizations, the likelihood of underpinning innovation and developing new competences tends to be higher (Burstein et al., 2003)	Combining an EO with knowledge management.	Knowledge management
Kale, Singh & Perlmutter (2000)	EO contributes to the relational capital of the firms, which may be seen as an investment in a market position.	Investment in a market position	In all industry
O'Shea et al., (2005)	Especially in-service industries the main determinant of success is the autonomy, risk taking and pro-activeness of its employees. Using panel data from 1980 to 2001, econometric estimators reveal	university spinoff activity	Service industry-University

Scholars	Content of issue	Social impact	Industry
	evidence of history dependence for successful technology transfer to occur although faculty quality, size and orientation of science and engineering funding and commercial capability were also found to be predictors of university spinoff activity.		
Stam & Elfring (2008)	Aims to extend this line of work by examining how the social capital that is embedded in the intra- and extra industry ties of a new venture's founding team influences the relationship between the firm's entrepreneurial orientation and its performance.	Social capital	In all industry
Matsuo (2009)	Sales entrepreneurial orientation (SEO) is also expected to have a motivational effect on salespeople since autonomy and the job variation that results from engaging in new practices increase involvement and motivation and lead to better sales performance.	increase salespeople's selling skills and competence	Sales department
Gore, (1998); Mummert, (1995); Wang et al., (2010)	Interestingly, both access to co-ethnic products and access to co-ethnic suppliers of utilities and facilities have a significant impact on firms' EO, which in turn has a significant positive effect on employment growth.	A significant positive effect on employment growth.	ethnic minority small business
Scholars	Content of issue	Social impact	Industry
Pol & Ville (2009)	The paper defines social innovation as "any new idea with the potential to improve either the macro-quality of life or the quantity of life", where macro-quality of life refers to "the set of valuable options that a group of people has the opportunity to select" (Pol & Ville, 2008). There are two classes of innovation that overlap significantly, as "business innovations that generate consumer products often [but not always] bring improvements to human welfare by widening the range of goods and services available to us.	material wellbeing, education opportunities, health, job security	In all industry
Hubert, (2010); BEPA (2010)	Social innovations create new social relationships or collaborations. In other words, those innovations that are not only good for society but also enhance society's capacity to act (BEPA, 2010).	New social relationships or new social collaborations	In all industry

Scholars	Content of issue	Social impact	Industry
Borzaga & Bodini (2012)	The first is that social innovations can be not only a new product or service. Social innovation should be replicable and have the potential to scale up in order to have a significant impact.	A new process, or a new way of organizing production activities (such as, for instance, a new type of enterprise).	In all industry

3. Research methodology

Research questions will test by the statistical package for the social sciences (SPSS v26). As using of SPSS software, test on descriptive statistics are examined. reliability test and factor analysis will be used the data. In addition, regression analysis will be conducted in order to measure the effect of independent variables to dependent variable.

3.1 Research frame work and hypotheses

This study have been created five domains “entrepreneurial orientation (entrepreneurship)”, “social innovation”, “service innovation”, “social value orientation” and “social impact”. Each main factor include 4~7 sub-variables. Accordingly, the research hypothesis is constructed according to the literature

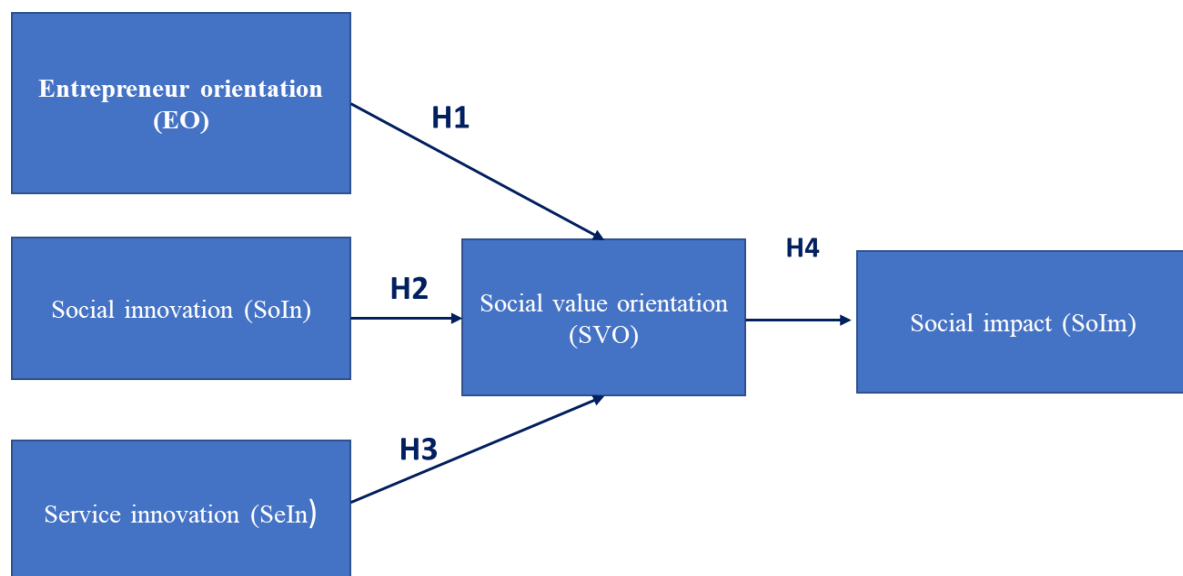


Figure 1. Research framework

review and, the proposed model of this study (Figure 1).

3.2 Research framework and hypotheses

Measures of goal concerns will be attained, firstly, by asking managers/owners, and CEO/vice CEO how important they select one and, secondly, by examination which item of independent variables will find most important by employees, managers/owners, and CEO/vice CEO of mining industry, health care, service industrial firm, government enterprise, heavy and not heavy industry (excluding mining), communication, post, telecom, education, and other in private sector. In order to measure research

purpose this research prepared a questionnaire depending on the scales used in previous studies in the literature. Miller (1983) modified the EO dimension's construct developed by Lumpkin and Dess (1996). This study used main constructs EO used by Lumpkin and Dess, 1996). This scale includes 7 items: 2 items for risk taking, 2 items for innovativeness, 1 item for pro-activeness, 1 item for competitive aggressiveness and 1 item for autonomy. Another independent variable is social innovation. Its scale includes 7 items: and adapted from these scholars as following: (Moulart et al, 2005; Mulgan, 2006, 2007, and 2012; Pol & Ville, 2009; Hubert, 2010); Caulier-Grice et al, 2012; Borzaga & Bodini, 2012). The mediator variable is social value orientation. This scale includes 4 dimension such as prosocial, individualistic, competitive and altruist; each dimension has one items and it adapted from Messick and McClintock (1968); Forsyth (2006). Next independent variable is service innovation. This scale includes 5 items: an item new service concept, an item new client interface, an item new service delivery and an item technological option. Therefore, they are adapted from De Hertog and Bilderbeek (1999). Service innovation will be selected mediator variable. Final variable is dependent variable of this research, and it collected well-defined social impact literature. This scale is 6 items and adapted several scholars. Totally, four hypotheses are tested as direct and indirect effect, and they are formulated in table 5.

Table 5. Research hypotheses

Hypotheses	Formulation of hypotheses
H1	Entrepreneurial orientation (WEO) positively influence to social impact (SoIm).
H2	Social innovation (SoIn) positively influence to social impact (SoIm).
H3	Service innovation (SeIn) positively influence to social impact (SoIm).
H4	EO, social innovation, and service innovation integrated with intermediary variable social value orientation positively influence to social impact (SoIm).

4. Research result

4.1 Descriptive statistics

The survey aimed to include citizens living in Ulaanbaatar and local areas. 88.2 percent of the participants in this study were women. 42.4% percent of the respondents evaluated wholesale and retail trade businesses. Respondents will rate the entrepreneur they know best who is running a business in their area of residence. 8 (9.4 %) respondents from the mining sector, 36 (42.4 %) from trade/wholesale and retail, 13 (15.3 %) from private hospitals and laboratories in the health sector, 14 (16.5 %) from tourism and hospitality, and 14 (16.5 %) from food industry business 16 (18.8%), post, communication, communication 1 (1.2%), transport /passenger and freight transport/ 4 (4.7%), art and art /production of works of art/ 6 (7.1%), others 13 (15.3 %) were evaluated respectively. **Table 6. Factor analysis and reliability test**

Variables	Item	Mean	SD	Variances	Factor loadings	Cronbach alpha
Entrepreneur orientation (EO)	EO1	3.60	1.136	56.220	0.684	0.802
	EO2	3.60	1.136		0.804	
	EO3	3.87	.997		0.787	
	EO4	3.55	1.180		0.766	
	EO5	3.15	1.170		0.699	

Service innovation	SeIn1	3.44	1.085	76.281	0.816	0.895
	SeIn 2	3.14	1.048		0.870	
	SeIn 3	3.00	1.244		0.889	
	SeIn 4	3.08	1.147		0.916	
Social innovation (SoIn)	SoIn1	3.45	1.075	68.188	0.810	0.883
	SoIn 2	3.65	1.077		0.832	
	SoIn 3	3.24	1.130		0.832	
	SoIn 4	3.86	.953		0.808	
	SoIn 5	3.44	1.128		0.847	
Social value orientation (SVO)	SVO1	3.62	1.023	52.990	0.756	0.694
	SVO 2	3.44	.981		0.657	
	SVO 3	3.48	.971		0.834	
	SVO 4	3.49	1.130		0.648	
Social impact of entrepreneurs (SIofE)	SIofE1	3.78	1.039	75.573	0.833	0.935
	SIofE 2	3.88	.956		0.854	
	SIofE 3	3.76	1.019		0.878	
	SIofE 4	3.80	1.067		0.873	
	SIofE 5	3.71	.961		0.905	
	SIofE 6	3.75	.975		0.872	
Total instrument	KMO P-value			0.954 .000		

Mean is at least 3.00m maximum is 3.88 and standard deviation shown .953 to1.244. In this research, initial solution, correlation matrix, KMO and Bartlett's test, communities are selected to see descriptive. For extraction method, it is principle component analysis, which means only one factor fixed number of factors extracted. Meanwhile, only one component was extracted as varimax method of rotation, so the solution could not rotate for variables such as the service innovation, social innovation, social value orientation and social impact. Accordingly, the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) must be greater than 0.6, communality values must be greater than 0.5, and eigenvalues must be greater than 1 (Tabachnick, B.G.; Fidell, L.S) Principal components and factor analysis.

Hypotheses test as regression analysis

In this used, linear regression analysis used in order to test four hypotheses. In conclusion, all the direct effects are positively significant. Therefore, the fours hypotheses are accepted. Table 5 recapitulates the results of hypotheses testing (Table 7).

Table 7. Hypotheses result

H	Path	Beta coefficient	Hypotheses formulation	Result
H1	EO<---SoIm	0.620	Entrepreneurial orientation (WEO) positively influence to social impact (SoIm).	Accepted
H2	SoIn <---SoIm	0.786	Social innovation (SoIn) positively influence to social impact (SoIm).	Accepted
H3	SeIn<--- SoIm	0.628	Service innovation (SeIn) positively influence to social impact (SoIm).	Accepted
H4	EO, SoIn, SoIn<--- SVO <--- SoIm	0.794	EO, social innovation, and service innovation integrated with intermediary variable social value orientation positively influence to social impact (SoIm).	Accepted

* $p < .05$, ** $p < .01$, *** $p < .001$

5. Conclusion and discussion

Big companies' entrepreneurship is contributing in economy and society development. For Mongolia, the sales revenue of the TOP 100 enterprises in 2021 increased by 2.8 trillion from the previous year and reached 35.4 trillion, which is equivalent to 82 percent of GDP, and the number of employees increased by 8.3 thousand to 99 thousand, which is equivalent to 8.8 percent of the total number of jobs. The total amount of taxes paid by TOP 100 enterprises increased by 26 percent from the previous year and reached 5.3 trillion MNT. In recent years, economic growth and dependence on mining have been increasing, but human and organizational development has been neglected. The quality of life of individuals and families is improving, but there is a need for more training and support in business education and entrepreneurial orientation of entrepreneurs, and to differentiate themselves with products, services, and management skills to compete in domestic and foreign markets.

The popular model of entrepreneurial orientation consists of 5 dimensions: autonomy, innovation, risk-taking, proactivity, and competitive aggressiveness. Articles such as "Innovate or Die" and "Enjoy Risk" in Forbes and other world-renowned business periodicals reflect this trend. Proactivity refers to how entrepreneurs engage with market opportunities by taking initiatives in the market. Competitive aggressiveness refers to how businesses react to the competitive trends and demands that already exist in the market. The research supported the hypothesis-1 that "Entrepreneurial orientation of entrepreneurs and the social impact of entrepreneurs are positively related" and it was estimated that consumers and customers will contribute to society and economy by acquiring and possessing entrepreneurial orientation.

Social innovation, on the other hand, refers to the development and implementation of new solutions involving changes in concepts, processes, products or organizations. It ultimately aims to improve individual and community well-being. In order to make good use of the potential of social innovation, there is a need for a policy framework that supports public and private sector actors to jointly create and implement innovative social solutions, thereby solving socio-economic problems and contributing to the strengthening and improvement of territorial stability. Over the past 30 years, business models have changed and innovation that serves everyone equally and involves the participation of members of society has been successful. In this sense, if any business owner can study the psychology, demands, and requirements of the society when making a solution to the problem, it will become a system or innovation to solve the problems faced by the society more effectively. Any society has problems. The

main issues of our society are health, education, governance and smooth and effective delivery of social services to vulnerable groups. This necessary condition determines the need for innovation.

A form of social innovation is the change in the public and private sectors through the influence of the knowledge, education, and research activities that are shared with others. If you don't do the right business for the welfare of society, there is a real danger of being pushed out of the market. Technological developments, social networks and infrastructure, and recent global trends show that businesses that create solutions that are not for society are increasingly unable to survive in the marketplace. Innovation is a link between two things: a problem and a solution. But social innovation refers to the value created by the public. On the other hand, it is based on public participation and activism. Business innovation is led by the person who initiated it and brings benefits to the users, while social innovation requires more participation and responsibility from the members of society. In this context, hypothesis 2 was put forward, and the participants of the study evaluated the value creation of entrepreneurs by creating innovative products and services in the society and economy. It has not been long since the start of service business development in Mongolia, but entrepreneurs in this field are learning innovation, technology knowledge, and the ability to use them. Online shopping, educational services, finance and banking businesses have taken steps to improve, modernize and develop their products using new service business concepts, interfaces, technology options and delivery services as dimensions of service innovation. From this point of view, the participants of the study evaluated the entrepreneurs, and hypothesis-3 was confirmed.

Hypothesis-4 was to predict the social impact of entrepreneurs through the mediating variable of "social value orientation" of the above independent variables, and entrepreneurs care about contributing to others, social well-being, and the quality of life of citizens while emphasizing the profit and return of their own business. it has been confirmed.

Small and medium-sized enterprises account for the majority of entrepreneurs in developing countries and make an important contribution to social and economic development by creating jobs. For example, according to the results of the World Bank's research, SMEs alone account for about 90% of business and more than 50% of employment. In the near term, Mongolia has set the goal of increasing access to financing for small and medium-sized businesses (SMEs) and improving good economic governance, accountability, and transparency.

Research findings give a new direction for policymakers to foster entrepreneurship culture and generate sustainable social impact. Managers and decision-makers can use the results to improve the progress of entrepreneurial activities. Entrepreneurial orientation leads to long-term social impact through the effective implementation of social innovation. Therefore, promoting characteristics such as autonomy, innovativeness, initiative, competitive capacity, and risk-taking in the organization in employees can elevate an entrepreneurial ecosystem that creates social impact. According to this, it is very important for business owners to increase their entrepreneurial orientation and to create economic value with their business while striving to contribute to the welfare of society. Using this research framework, it is possible to conduct further theoretical and empirical research and develop a theoretical research model.

6. References

Caulier-Grice, J., Davies, A., Patrick, R., Norman, W. (2012). Defining Social Innovation. Part One of Social Innovation Overview: A deliverable of the project: "The theoretical, empirical and policy foundations for building social innovation in Europe" (TEPSIE), European Commission – 7th Framework Programme. Brussels: European Commission, DG Research.

Christopherson, S., Kitson, M and Michie, J. (2008). Innovation, networks and knowledge exchange. *Cambridge Journal of Regions, Economy and Society*, Oxford University Press for Cambridge Political Economy Society, 1(2), 165-173.

De Hertog, P. and Bilderbeek, R. (1999). Conceptualising service innovation and service innovation patterns. European Commission sponsored 'SI4S' programme (services innovation, innovation for services) *hander book*.

Dess, G. G. and Lumpkin, G. T. (2005). The role of entrepreneurial orientation in stimulating effective corporate entrepreneurship, *The Academy of Management Executive*, 19(1), 147-156.

Forsyth, D. R. (2006). Conflict. *Group Dynamics (5th Ed.)* (Page: 378-407) Belmont: CA, Wadsworth, Cengage Learning.

Messick, D. M., and McClintock, C. G. (1968). Motivational basis for choice in experimental games. *Journal of Experimental Social Psychology*, 4(1), 1-25.

Miller, D. and Friesen, P. (1978). Archetypes of strategy formulation. *Management Science*, 24, (9), 921-933.

Mulgan, G. (2006). The process of social innovation, in innovations. *Technology, governance, globalizations, spring, MIT press, Boston*, 146(6), 145-162.

Mulgan, G. (2007). Social Innovation; what it is, why it matters and how can be accelerated. Skoll Centre for Social entrepreneurship: The Young Foundation.

Mulgan, G. (2012). The Theoretical Foundations of Social Innovations. In Social Innovation – Blurring Boundaries to Reconfigure Markets, ed. Alex Nicholls and Alex Murdock, 33-65. Basingstoke, et al.: Palgrave Macmillan.

Murphy, R. O, Ackermann, K. A, Handgraaf, M. J. J. (2011). Measuring social value orientation. *Journal of Judgment and Decision Making*, 6 (8), 771-781

Nauta, A., De Dreu, C. K. W., and Van Der Vaart, T. (2002). Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior. *Journal of Organizational Behavior*, 23(2), 199-213.

Tabachnick, B.G.; Fidell, L.S. Principal components and factor analysis. Using Multivar. Stat. 2001, 4, 582-633.

Wiklund, J., and Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, 24(13), 1307-1314.

Van Lange, P. and Visser, A. M. (1999). The pursuit of joint outcomes and equality in outcomes: An integrative model of social value orientation. *Journal of Personality and Social Psychology*, 77(2), 337-349.

Zahra, S., and Covin, J., (1995). Contextual influence on the corporate entrepreneurship-performance relationship: a longitudinal analysis. *Journal of Business Venturing*, 10(1), 43-58.

SSBA-57

Service quality at sunny dream Mongolia company

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Abstract: Tourism is one of the fastest growing industries not only in Mongolia, but also, in the world. Many developed countries are completely dependent on tourist arrivals. According to the study, the number of global tourists had tripled to 1.6 billion by 2019 compared to 1995, and the number of tourists visiting the Asia-Pacific region is growing faster than other regions of the world.

Managers in the tourism sector always strive to improve service quality and customer satisfaction. Qualified service in the travel industry is an essential part of business growth. Sunny Dream Mongolia Tour Company is one of the travel agents in Mongolia that considers high service quality as a business target.

After a long time working in tourism, I really understand the true importance of service quality whose key is the satisfaction of tourists. Therefore, it is urgent to be analyzed and observed more.

Keywords: Service Quality, Sunny Dream

NGOT-58

Effects of radial growth rate on juvenile wood properties of *Pinus sylvestris* planted in Mongolia

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Abstract: The establishment of forest plantations in boreal zones in Mongolia is important for wood production as well as carbon dioxide fixation. The present study aims to elucidate the juvenile wood properties (basic density, modulus of elasticity [MOE], modulus of rupture [MOR], and compressive strength parallel to grain) of plantation-grown *Pinus sylvestris* to promote the establishment of plantations. In addition, the effect of the radial growth rate on wood properties was also evaluated using a linear mixed-effects model. Sample *Pinus sylvestris* L. trees were collected from a plantation located in Selenge, Mongolia (50°05'–12°N, 106°14'–31°E). The plantation was established in 2003 using two-year-old seedlings with an initial spacing of 4.0 × 1.0 m. The experimental thinning treatment was conducted in 2016 in half of the area. In 2020, dominant, medium, and suppressed trees (three trees in each growth category) were selected from non-thinned and thinned sites (nine trees in each site). The logs (30 cm in length) were collected from 1.3 to 1.6 m above the ground's surface. The logs were processed into radial boards with a thickness of about 30 mm. The radial boards were used for the following experiments. Statistical analysis was conducted using R software environment, version 4.0.3 (R Core Team 2020). In the juvenile wood phase, wood properties were increased from the pith to bark side based on the results of model selections. Wood properties in plantation-grown *P. sylvestris* trees in Mongolia to promote the establishment of plantations of this species in Mongolia and boreal areas. Based on the results of the selection of mixed-effects models, the values of all wood properties tested in the present study increased from pith to bark in the juvenile wood phase. By using the best model for radial variation, mean values of juvenile wood properties (up to the 20th annual ring from pith) were estimated: annual ring width = 1.8 mm, basic density = 0.40 g/cm³, MOE = 5.35 GPa, MOR = 65.1 MPa, and compressive strength = 28.4 MPa. With a few exceptions, these values were similar to those obtained in the trees grown in natural forests in Mongolia, suggesting that plantation-grown trees in Mongolia do

not always exhibit a lower quality of wood compared to wood from trees grown in Mongolian natural forests.

Thus, if wood resources of *P. sylvestris* are mainly produced from plantations rather than natural forests in Mongolia, the quality of wood from plantations is almost identical to that from natural forests. In addition, the results of variance component analysis revealed that wood properties, except for basic density, were not affected by the radial growth rate in *P. sylvestris* trees planted in Mongolia. Even if the variance component ratio of the growth category reached 50%, differences in basic density between dominant trees and trees in two other growth categories were not substantial. Detailed information about the plantation was reported in a previous paper (Ganbaatar et al. 2021, Batsaikhan et al. 2023).

Keywords: annual ring width, basic density, compressive strength, modulus of elasticity, modulus of rupture

SSOT-60

The research on using interactive methods in teaching. to improve the result of the general entrance examination

(On case of the 12th grade social science subject in lyceum high school of Technology school in Darkhan)

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Abstract: In the current conditions of social development, due to the growing need for a creative person who can think outside of a single pattern, the researchers of education believe that it is appropriate to focus on the development of the human mind. Therefore, we believe that it is appropriate to use an interactive teaching method that supports the participation of students, stimulates their motivation to create knowledge, and leads to the acquisition of skills to prepare citizens who will live in this millennium with the multifaceted intellectual abilities required to live effectively in the new world. It is considered that the interactive method is useful for solving the problems faced by students, such as how to learn and apply theoretical knowledge to case studies, and how to effectively pass the general entrance examination. In this article, we compared and analyzed the results of the interactive method used in teaching since 2012 with the result from 2014 to 2022 year of general entrance examination. The result of the research shows that the success of the students is positive, so it is believed that the use of interactive methods in teaching is effective.

Keywords: interactive method, knowledge, ability

1. Introduction

In the field of education, the traditional system aimed at acquiring knowledge, skills, and practices is lagging behind modern requirements. It is becoming important to develop the skills of students to be creatively active, to think creatively, to evaluate, to value efficiency, and to be able to quickly adapt to the changing needs of the market.

Investigating and using interactive methods, which are considered innovative methods of teaching, analyzing the results achieved, and determining what should be focused on and improved in further training is important for effective organization of training.

The results of the general entrance examination of students using interactive methods in training the main purpose of this work is to find out the results of the example of the 12th-grade social studies course of DaTS Lyceum High School and to determine the ways of further implementation. Mathematical statistics, synthesis, and methods were used in the research.

2. Literature review

Various scientific studies in the field show that research on innovation in education is very active nowadays. Innovative approaches to education in modern scientific works should be comprehensive and

cover the entire range of educational work to prepare future specialists' special attention was paid to It is also necessary review the theoretical and practical basis of educational content, the preparation of teachers' professions, teaching methods, and the development of new teaching methods.[5]

Domestic and foreign researchers on this issue, such as J. Martin, I. Lerner, O., Pehota, G. Nemehjargal, Sh. Ichinkhorloo has actively studied. However, it is important to clarify the characteristics and differences of innovative learning methods, as well as to determine the advantages and perspectives of using different innovative learning methods.

The process of educational innovation and technology used in the teaching process is to create knowledge, skills, and practices, to fully determine the practical connections and interrelationships of knowledge to introduce students to a unified intellectual framework, to think freely or to challenge new ideas, to model, question, and challenge many theories. It is important to succeed in the general entrance examination by developing intellectual abilities through many intellectual activities such as experimenting, visualizing, imagining, debating, criticizing, questioning, eloquently presenting, and creating.

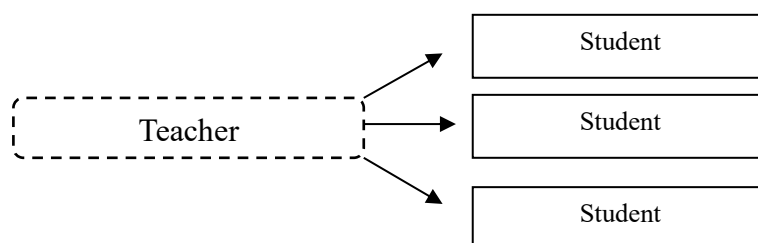
Training includes two main components: sending and receiving information. The main weakness of many teachers is that they teach the subject based on their own experience and beliefs, imparting knowledge from their understanding. Also, when evaluating knowledge, when a student answers in his own words instead of the words of the textbook or lecture, the teacher judges the answer as not understanding the lesson or as an inappropriate answer.

Innovative methods of teaching also take into account the creative approach to the subject and the assessment of the ability to solve standard decisions in non-standard ways. Education should be an interesting and attractive process that contributes to professional and personal growth, not just a procedure or method of obtaining a certificate. In classical education, the teacher is the sender of information, and the student is the receiver of information. In such situations, the "chalk and talk" method is often used. This method has been used as a teaching strategy by most educational institutions for decades. In this case, the learning was passive, and the learner played a very small role in the learning process.

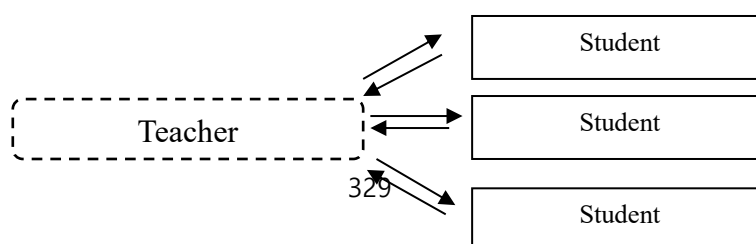
The main methodological innovation is also related to the use of interactive forms and methods of training. Lessons that actively involve students in the learning process provide an opportunity to fully understand and establish theoretical knowledge.[3]

In general, three forms of interaction between teachers and students can be distinguished.[5]

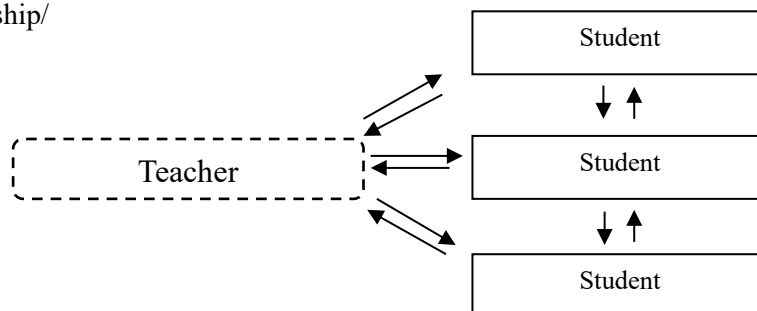
1. Passive mode: The teacher mainly works and directs the lesson process; the student is a passive listener. / Passive form of teacher-student communication /



2. Active mode: The student actively participates, and the teacher and student have equal rights. /Active form of the teacher-student relationship



3. Interactive mode: Students actively communicate not only with the teacher, but also with each other, and the activeness of students prevails in the learning process. /Interactive form of teacher-student relationship/



The goal of the interactive teaching method is to create favorable learning conditions for the student to feel his intellectual abilities and success, and to make the learning process effective. In other words, interactive learning is, first of all, conversational learning in which active interaction between teachers and students takes place.

The Role of interactive teaching methods [5]

- Stimulate interest in the subject and independent learning.
- Develop the ability to have your own opinion and defend it
- Creating social and professional practices
- Effective mastery of the taught material
- Learning to independently search for ways to solve given tasks and justify the decisions made.
- Active cooperation and teamwork training
- To create a level where students are aware of their rights and responsibilities.

The following interactive forms are used in the training:

- Round table method
- Discussion
- Brainstorming
- Business and role play
- Training, master class
- Case-study

Depending on the situation, the teacher will choose the most suitable form of training. In interactive lessons, the teacher should follow the following principles when providing teaching materials.

1. The lesson is not a monotonous lecture, but a public work in which students interact with each other and with the teacher.
2. All students have equal rights, regardless of social status, age, experience, or workplace.
3. Every student has the right to have his own opinion on any matter.
4. Under no circumstances should a person be criticized, only opinions can be criticized.
5. Everything discussed in the lesson is only information for thinking and not a guide for action.

By following these principles, both teachers and students will get the most result out of interactive lessons.

Lesson preparation:

- The teacher chooses the subject of the lesson and the context of the lesson.
- Define concepts and terms that all students will understand equally.
- Choose a specific form of interactive lesson that will be most effective for working on a given

topic and in a given group.

Beginning:

- Students will be informed about the subject of the lesson.
- Formulate the purpose of the lesson.

Main part:

- Depending on the type of interactive lesson, the characteristics of the lesson depend.

Conclusion:

As the feelings and emotions experienced by the students increase during the lesson, they begin to think critically. The next step in a reflective lesson is to evaluate. The evaluation will end with the teacher's general conclusion.[8]

Let's take interactive lessons as an example.

1. The feature of the main part of the lesson that is organized based on the round table method (Method kruglogo stola) is that it reinforces the previously learned knowledge, fills in the missing information, acquires the ability to solve problems, and learns the culture of arguing. In other words, a special feature of this method is that it combines topic discussion with group repetition. When organizing a round table lesson, one or two problematic conditions on a given topic should be discussed during the debate, and various viewing materials, such as diagrams and graphs, should be carefully prepared for the topic. (Not limited to one speech, stating your opinion, citing evidence, etc.).

2. Discussion (Discussion)-the based course is characterized by discussing specific issues together and comparing issues, information, and suggestions. Its main purpose is training, diagnosis or prediction, training, guidance, change of indications, creativity stimulation, etc. The outcome of the debate depends on the student's preparation, level of information, and ability, as well as the degree to which they have mastered terms, definitions, and concepts. Here, the behavior of the participants and the ability of the teacher to conduct a debate are no less important.

3. Debate (Opinions, criticisms, arguments). It is a form of round table method based on the exchange of ideas and free expression of opinions on a given topic. Students will be divided into two groups, male/female groups. Debate is characterized by giving yes and no answers to given questions. One group will be the positive, affirmative answer side, and the other will be the negative answer side. In the course of the critical dispute, the participating parties will provide examples to confirm, document, explain and provide various information. In this way, the debate will help students acquire the ability to create and defend their positions, strengthen the ability to communicate with the audience, team thinking, leadership, and communication culture, and practice public speaking. It is important to acquire the practice of researching sources of information and literature, as facts to be discussed in the course of the debate will require concrete examples. Also, as a result of the debate, students develop the ability to listen, write, and organize. [7]

4. One of the well-known methods that increase the creative activity of students is the method of brainstorming (method mozgogogo shurma), which is used to search for non-traditional solutions to various tasks. When discussing a problem, participants state as many decision options as possible. After that, choose the most suitable and correct version that can be used in practice. The brainstorming method allows you to generate the most ideas in the least amount of time by creating innovative approaches to problem-solving. This method facilitates creative development, unlimited dreaming, prognostication, and the satisfaction of finding new ideas. When organizing a brainstorming session, there should be no criticism that can negatively affect the creative atmosphere of the participants and lock their thinking into a certain framework. The result of brainstorming is to arrive at a quality solution to a given problem by linking, modifying, and evolving one's own or other ideas.

5. One form of interactive training is the real and is a business game approach based on creating

social content. During the business game, each participant performs a task corresponding to his role and role, and training takes place during the joint activities of the participants. In the business game, the relationship that develops during the joint acquisition of knowledge will create and simulate the relationship of people in the actual activity being studied, thereby developing the ability to work together and practice. By shipping method:

A. Business game of the month: The game takes place in a specially organized field, with strict rules and the results are recorded.

B. Role-play: Each participant performs a certain task or plays a role.

C. Group discussion: In the process of discussion, business advice and cooperation is acquired.

D. Imitation game method: It helps the students to develop a habit of behaving in certain situations.

6. Master class: This is the main tool for conveying new ideas about the educational system. Working in small groups, this approach allows for the exchange of experiences and ideas. During the master class, all students have the opportunity to actively participate in the activity. The main idea of this method is to be given a problem-solving role and come to a decision by playing different situations. In doing so, the learning process is more important and valuable than the knowledge itself.

Evaluation of the research: Judging from the above-mentioned materials:

- Interactive training provides an opportunity to simultaneously solve several goals aimed at developing communication skills and habits.
- The interactive method will help students establish emotional connections with each other, develop creativity, think innovatively, protect their interests, and develop teamwork skills. At the same time, it is a strong motivation for self-development learning, active living, and creativity.
- From a practical point of view, the use of interactive methods in training reduces the psychological pressure on students and allows students to focus on the main issues and topics of the lesson.

3. Results, Data Analysis

DaTS Lyceum High School graduating students in the general entrance exam Considering that one of the important factors affecting the successful results is the teaching method chosen by the teacher, the results were analyzed using the interactive method.

[Table 1] Exam result

Dimensional score 800		Examination year	Average score	Occupied place in province
№				
1	2015 OH	2015	501	VI II
2	2016 OH	2016	590	Y
3	2017 OH	2017	551	VI

4	2018	62 5,8	II
5	2020	536	VI
6	2021	577	III
7	2022	58 5,3	II

Comparing the results of the national entrance examinations in social studies from 2016 when the interactive method in training was introduced, it can be seen that the average of the previous year's dimensional score has increased. It was observed during the research that the average score of the national entrance examination increased little by using the interactive method in the training, and it is also related to the academic quality and active participation of the students in the given year. The results of the 2020 entrance exam show that the learning environment has a significant impact, although the results indicated a positive effect when using interactive methods in teaching. In 2020, due to the pandemic, the average score of the national entrance exam decreased due to the transition of the world-class educational environment to an electronic format. This is a major problem faced by all teachers due to the lack of experience in using online learning methods and the failure to consider the obstacles that may arise. It was observed from the results of the 2021 and 2022 national entrance examinations that the use of interactive methods in the e-learning environment from 2021 has a positive effect on teaching guidance. Therefore, it is effective for every teacher to use interactive teaching methods. This was observed from the results of the 2022 national entrance examination. Therefore, it is effective for every teacher to use interactive teaching methods.

4. Conclusion

The use of innovative methods that include interactive training continues to be important to meet modern demands.

Innovative methods not only help to develop personal qualities, actively acquire new knowledge, encourage social activity and creativity of students, help to bring the learning process closer to everyday practical life, but also strengthen the knowledge of each student, develop the ability to solve problems independently and affect the quality of education. To successfully introduce an effective form of education, teachers need to acquire comprehensive practical knowledge of using modern innovative methods of working with students.

It is believed that the introduction of interactive methods into training has the following significance. Firstly training is developed by both its main subjects, teachers and students the basic conditions to make a creative environment that matures and activates learning and teaching activities, ***secondly***, students' curiosity, wonder, and curiosity, to stimulate and direct aspirations, and to make people feel that many issues need to be pondered and pondered, and the key to the process of understanding, by inquiring, asking, learning, studying, and aspiring accordingly, ***thirdly***, knowledge of the problem to be considered as a decision, so that the history of mankind is the history of problems, and the study of them, in turn, becomes a means of self-identification, direction, and guidance for people to compare with current culture and problems, ***fourth***, teacher's professional reputation, teacher's ethics, teaching quality, etc. It is considered one of the important steps to solve today's important problems.

References

- [1] Гузеев В.В. (2011) “Планирование результатов образования и образовательная технология. М.народное образование”
- [2] Жуков.Г.Н.(2015), “Основой общей профессиональной педагогики:Учебное пособи.М.Гадарики”
Глоссарий современного образования (терминологический словарь)// Народное образование,1997, (3) pp.5-17
- [3] Ичинхорлоо.Ш.(2013)” Сургалтын арга зүйн шинэчлэл”. pp.17-21
- [4] Маликова.Н.Р. О. (2003)” некоторых инновационных методах преподавания социологии” (2)pp.178-194
- [5] Нэмэхжаргал.Г (2010).”Диалогийн философи утга ба боловсрол”. pp15-17
- [6] Сорокин.Н.Д.(2015)”Об инновационных методах в преподавании социологических курсов”//Социс,(8)
- [7] Педагогика и психология высшей школы: Учеб. Пособие для вузов (2005) /М.В.Буланова-Топоркова-Ростов-на-Дону: Феникс,
- [8] Черкасов.М.Н.(2008) “Инновационные методы обучения студентов //XIV Международная заочная научно-практическая конференция <<Инновации в науке>>” Новосибирск

CONCEPTUAL METAPHORS AND THEIR LINGUISTIC EXPRESSIONS

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Abstract : This study is motivated by the fact that there have been very few studies on the use of metaphors in Mongolian from a cognitive perspective, which is a relatively new idea for Mongolian linguistics. For this reason, this study attempts to propose a proper cultural model to treat emotion concepts in Mongolian and demonstrate how cultural aspects, figurative languages of emotions, and human physiology play active roles in this system of language and culture. Thus, adopting a cognitive linguistic perspective, this study investigates the metaphorical linguistic expressions of emotion concepts in relation to *anger*, *love*, *happiness*, and *sadness* in English and Mongolian. Specifically, it examines culture-specific and language-specific realizations of conceptual metaphors for emotions in the two languages within the CMT framework.

In order to perform this study, a total of 678 linguistic expressions describing the four basic emotions as the research materials were compiled from different sources in English and Mongolian. To compare the results of the study in both languages, the researcher selected the three parameters proposed by Barcelona (2001) and Kövecses (2001) including (1) the existence and nonexistence of language-specific mappings, (2) degrees of linguistic elaboration, (3) degrees of linguistic conventionalization. Parameter 1 concerns differences in the existence or non-existence of language-specific mappings in English and Mongolian. Parameter 2 pertains to differences in the degrees of linguistic elaboration of conceptual metaphors for emotions in the two languages. Parameter 3 concerns the degrees of linguistic conventionalization.

This study has found a number of metaphorical source domains having a wide application within the four basic emotions concepts in English and Mongolian. Based on the generalizations for emotions proposed by Kövecses (2000), the source domains are classified into four main groups in accordance with which target domains they occur in the two languages. The source domains chosen for the analysis are rooted in the most fundamental human experiences in sedentary and nomadic cultures.

This current study highlights the importance of culture in understanding the relationship between metaphor, culture, and cognition, and it provides comparative generalizations for the four basic emotion concepts and gives fundamental explanations in English and Mongolian. This systematic comparative analysis of emotional metaphors in English and Mongolian contributes importantly to the major claims of the Contemporary Metaphor Theory, which states that metaphors are grounded on both universal embodiment and social-cultural experiences. Even though English and Mongolian belong to very different language families representing totally different sedentary and nomadic cultures, they share some universal conceptual metaphors for particular emotions with each other. Emotion metaphors are closely related to certain physical aspects of the human body across cultures; however, the speakers of English and Mongolian differ in many ways: differential experiential basis, cognitive preferences, social and physical environments, and the histories of the two nations. Finally, this research summarizes by stating that universal human embodied experiences can be the basis for highly schematic conceptualizations of emotions across cultures. The culture-specific and language-specific mappings and their elaborations are grounded only on cultural embodiment at a specific level in cultures.

A STUDY ON THE IMPACT OF LIFE LONG EDUCATION PROGRAMM ON THE QUALITY OF LIFE FOR ELDERLY

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Abstract: 최근 노령인구가 증가하는 노년기사회에서 평균 수명의 연장으로 노년기가 점차 길어져 노인들은 은퇴 후 약 25-30년 정도의 긴 빈 둥지시기를 보내게 되었다. 길어진 노년기를 보다 효율적이고 유익하게 보내고, 질적 향상 된 노년의 삶을 보낼 수 있도록 해주기 위한 방안 중 하나가 노인교육이다. 노인교육은 빠르게 발전하는 현대 사회에 적응할 수 있는 능력을 향상시켜 주며 동년배 간의 친교와 사회참여 및 건전한 여가 시간을 보낼 수 있게 해 준다. 그러므로 노인의 노년기의 삶을 만족하게 보낼 수 있으며, 보다 효율적이고 유익한 노년의 생활을 보낼 수 있게 해 준다. 본 연구에서는 노인의 삶의 질에 영향을 미치는 요인들 중에서 노인 교육이 중요한 요인으로 작용할 것으로 보고 현재 노인교육에 참여하고 있는 노인들을 대상으로 노년기 삶의 질(만족도) 향상에 미치는 영향을 연구하였다. 그 결과 노인교육에 참여한 기간이 길수록 노인교육의 필요성에 공감할수록, 노인교육 프로그램에 만족할수록 삶의 질이 더 높은 것으로 높게 나타났으며, 이는 앞으로도 노인들의 삶의 질 향상을 위해서는 즉, 노인들이 보다 건강하고 행복한 노년기 생활을 보낼 수 있게 하기 위해 노인교육이 더욱 활성화 되어야 한다는 것을 시사하고 있다.

Keywords: 노년기, 노인교육, 노인 평생교육 프로그램, 삶의 질

Хураангуй: Сүүлийн үед өндөр хөгжилтэй орнуудын хүн ам зүйн байдал шинжлэх ухаан технологийн хөгжлөө дагаад дундаж наслалт уртасч, нийгэмд өндөр настнуудын оролцоо ихэсч, тэтгэвэрт гарсны дараа 25-30 орчим жил үргэлжилж байна. Иймд хөгжиж буй орнуудын судлаачид тэтгэврийн дараахи амьдралыг хэрхэн хувь хүн болон нийгэмд үр ашигтай өнгөрүүлэх талаар судалсаар шинэлэг арга замыг боловсруулсаар байна. Ахмад настнуудын тэтгэврийн дараахи амьдралыг үр ашигтай өнгөрүүлэх, өндөр настны амьдралын чанарыг сайжруулахад чиглэсэн арга хэмжээний нэг нь өндөр настны боловсрол юм. Өндөр настны боловсрол нь хурдацтай хөгжиж буй орчин үеийн нийгэмд дасан зохицох чадварыг нэмэгдүүлж, үе тэнгийнхэнтэйгээ нөхөрлөх, нийгмийн оролцоо, чөлөөт цагийг зөв боловсон өнгөрүүлэх боломжийг олгодог. Иймд ахмад настнууд өтөл насандаа сэтгэл хангалуун амьдрах, өндөр насан дээрээ илүү үр ашигтай, үр өгөөжтэй амьдрах боломжтой. Энэхүү судалгаанд ахмад настны амьдралын чанарт нөлөөлж буй хүчин зүйлсийн дотроос ахмад настны боловсрол чухал хүчин зүйл болно гэж үзэн, өндөр настнуудын амьдралын чанар (сэтгэл ханамж) дээшилэхэд ямар хүчин зүйл илүү нөлөөлж байгааг судалсан болно.

Үүний үр дүнд ахмад настны боловсролд хамрагдах хугацаа уртсах тусам ахмад настнуудын боловсролын хэрэгцээ нэмэгдэж, ахмад настны боловсролын хөтөлбөрт сэтгэл хангалуун байх

Түлхүүр үг: Өндөр настан, Насан туршын боловсрол, Амьдралын чанар,

본 연구에서는 고령사회 진입을 앞둔 시점에서 노인의 생활에 영향을 주는 여러 요인들 중에 노인 교육이 미치는 질적 영향이 어떠한지를 알아보고 문헌적 고찰과 실증적 연구를 토대로 현재 교육에 참여하고 있는 노인을 대상으로 고령사회에서 교육프로그램이 노인의 삶의 질 향상에 어떠한 영향을 미치며 노인교육의 필요성과 의미를 강조하기 위한 목적 있다. 연구문제로는 첫째, 조사대상자의 인구 사회학적인 특성, 개인적인 노화도, 평생교육 이용실태와 참여유형, 평생교육 만족도의 상관관계는 무엇인가? 둘째, 평생교육 프로그램 만족도, 개인적인 노화도, 삶의 질의 상관관계는 어떠한가? 셋째, 인구 사회학적 변인에 따른 평생교육 프로그램 참여도 및 참여유형의 만족도는 삶의 만족도와 어떠한 상관성을 가지는가? 넷째, 조사 대상 노인들의 삶의 질 변화를 예측하는 가장 중요한 요인은 무엇인가?

2. Survey research

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효과성과 만족도를 알아보기 위해 기관의 특성별로 조사한 결과 노인 교육 참여 후 노인의 자기 존중감 태도가 높아졌으며, 노인들의 가족관계, 사회생활 태도에도 좋은 결과를 보이며, 사회봉사 활동에도 참여하는 것으로 나타나 노인교육이 노인들의 사회 활동 태도에 매우 열정적인 향을 미치고 있는 것으로 시사되고 있음을 설명하고 있다. 이순희(2001)의“노인교육 프로그램 개발 및 효과분석”의 연구에서는 교육 효과 검정을 위해 교육 전·후 검사 도구를 사용해 연구한 결과 교육 전 지식의 평균은 교육 군과 비교육군간의 유의한 차가 없었으나, 교육 후 교육 군이 비교육군 보다 높게 나타난 결과로 보아 노년과 노후생활에 필요한 지식의 함양을 위해서는 노년기에도 교육이 효과가 있었으나 노인의 태도변화에는 한계가 있었다는 결과가 나타났다. 한편, 이 연구에서 노인교육강사의 전문성에 대해 노인의 심리적, 사회적 특성을 잘 아는 노인전문가가 아니었다는 점을 제한점으로 지적 했으며 노인 교육의 발전을 위해 다양한 분야의 노인 전문 인력의 확보와 다양한 교육방법의 연구를 제언하다.

<표 1-1> 선행연구 결과

정재임	o	o	o	o	o	x	x	o
정미영	o	o	x	o	x		o	o
고승덕	o	o		o	o	o	o	o
류용무	x	o	o	o	x	o	o	o
이경옥	x	o	o	o	o	o	o	o
김귀분			o	o	o			o

또한, 노인의 삶의 질에 향을 미치는 요인들에 관한 선행연구들을 살펴보면, 위 표에 먼저 정재임·차자·김정아(2005)의 연구에서 노인의 삶의 질 정도와 관련 변수간의 상관관계 및 삶의 질에 향을 미치는 요인에 대한 연구결과를 보면 일반적 특성에 따른 삶의 질의 차이에서 성별, 교육정도 별, 의료수혜형태, 거주형태에서 통계적으로 유의한 차이를 나타내고 있다. 또한 삶의 질과 지각된 사회적지지, 지각된 건강상태, 일상생활수행능력은 유의한 긍정적 상관관계를 나타내고 있다. 즉, 지각된 사회적지지 정도가 높을수록, 자신의 건강을 좋다고 지각할수록, 일상생활활동 능력 정도가 높을수록 삶의 질이 높은 것으로 나타났다. 정미·심미(2009)의 연구에서 이용시설 참여노인을 대상으로 삶의 질 요인을 분류하고, 노인특성에 따른 삶의 질의 차이를 분석하고, 노인의 삶의 질에 향을 미치는 이용시설 프로그램참여도 및 자아존중 감, 우울의 향을 분석해 연구한 결과 성별, 학력, 동거상태, 건강상태에서는 통계적으로 유의한 차이를 보였으나, 경제적 삶의 질을 분석한 결과 통계적으로 의미 있는 차이는 없는 것으로 나타났다. 류용무(2009)의 연구

에서 노인의 삶의 질에 향을 미치는 요인들을 분석한 결과 노인들의 연령, 학력수준, 한 달 용돈, 재혼 여부, 등은 건강 상태와 거주 지역, 주거형태, 학력, 한 달 용돈 등은 경제 수준과 또한, 노인들의 연령, 학력 수준, 한 달 용돈, 결혼상태 등은 주관적 노화도와 연령, 학력수준, 한 달 용돈 등은 자립 활동과 접한 관련이 있는 것으로 나타났고, 주거형태는 의사소통과 성별, 연령, 주거형태 등은 여가 및 사회활동과 접한 관련이 있는 것으로 나타났다. 즉, 학력이 높고, 부부가 함께 살고, 노인 스스로 경제적 역할을 감당 할 수 있을 때 노인의 삶의 질이 향상된다는 것을 강조하고 있다. 고승덕·조숙행(1995)의 연구에서는 삶의 질 향상을 위하여 삶의 질에 향을 미치는 주요 요소들을 분석하여 연구한 결과 성별, 연령, 종교, 학력, 배우자 유. 무, 동거상태, 여가활동 유. 무, 요실금 유. 무 등에서 유의한 차이를 보이고 있는 것으로 나타났다. 즉, 종교가 있고, 고학력일수록 배우자가 있으며, 노년기에 도 여가 활동을 하며, 직업이 있고 의사 결정권이 있는 노인이 자아존중감을 갖고 있어 삶의 질이 높다는 결과이다. 이경옥(2008)의 연구에서 동거할수록, 복지시설 이용이 편리할수록, 경제적으로 여유가 있을수록, 종교가 있을수록, 건강할수록, 사회적 지지를 받을수록 삶의 질이 높았다. 전체적으로 볼 때 삶의 질에 개인특성이 가장 큰 향을 미치지만 가족관계 특성과 지역사회 특성 또한 유의한 향을 미치는 것으로 나타났다.

김귀분 ·석소현(2008)의 연구에서도 노인의 삶의 질과 관련요인들 간의 관계를 분석한 결과 지각된 건강 상태, 생활만족도, 가족지지, 자아존중감, 경제적 상태와는 순상관관계가 있는 것으로 나타났으며, 지각된 건강상태가 높을수록, 생활만족도가 높을수록, 가족지지가 높을수록, 자아존중감이 높을수록, 경제적 상태가 높을수록 삶의 질 정도가 높게 나타났다. 또한 삶의 질 정도는 우울과 연령과는 역상관관계가 있는 것으로 나타나, 우울이 낮을수록, 그리고 연령이 적을수록 삶의 질 정도가 높게 나타났다. 배나래(2007)의 “노년기 삶의 질에 향을 미치는 생태체계적 요인에 관한 연구”의 연구에서 노인의 삶의 질 향상을 위한 생태학적 접근 결과 노인 자신 의 삶의 질 향상을 위한 의식변화를 노인 스스로의 노력과 동시에 가족·지역사회 등의 주변의 지지가 절실하므로 개인적 차원과 지역 사회적 차원의 통합적 방안 마련을 강조하다. 노인의 연령에 따른 삶의 질에 관한 선행 연구들의 연구 결과들을 살펴보면 먼저 정명숙(2005)의 “연령과 삶에 대한 만족도”의 연구에서 우리나라 중.고 · 대학생, 성인, 노인을 대상으로 삶 전반에 대해 느끼는 만족감을 조사하는 데, 전반적 만족도 점수는 노인이 가장 높았고, 중학생, 성인, 대학생이 차례로 그 뒤를 이었으며, 고등학생이 가장 낮았다. 즉, 연령이 높을수록 삶의 질에 대한 만족도가 높아진다고 나타났으며, 노인의 연령이 낮을수록 삶의 질이 높다는 연구(허준수, 2004:139)가 있는 반면, 연령이 높을수록 삶의 질이 높게 나타 난 연구 (이지연,2003:60)도 있다. 또한 연령과 삶의 만족도는 아무런 향을 미치지 않는다는 연구(류용무, 2009:30)도 있어 일관되고 단정적인 결과를 찾아보기는 어렵다. 김미령(2006)은 전기와 후기 여성노인의 삶의 질에 관한 연구에서 삶의 질에 긍정적인 향을 주는 요인이

배우자, 건강인지, 자긍심, 사회적 지지라고 보고 하다. 전기노인의 경우 역할수행은 삶의 질에 향을 미치지 않았고, 경제적 어려움은 삶의 질에 부정적 향을 주었으며, 사회참여는 긍정적인 영향을 주었다고 보고 있으며, 반면에 후기노인의 경우 역할수행은 삶의 질에 긍정적인 향을, 사회참여는 부정적인 향을 미쳐 전기와 후기노인의 삶의 질 향요인 에 차이점이 있음을 밝혔다. 유정이(2006)의 “노인의 연령에 따른 삶의 만족도에 향을 미치는 요인”의 연구 결과에서는 55-59세 노인의 삶의 만족도에 가장 큰 향을 미치는 요인은 배우자 요인이며, 60-64세 노인은 배우자와 건강요인, 70세 이상에서는 배우자 요인이 가장 큰 영향력을 가진 것으로 나타났다. 고보선(2003)이 “제주노인의 주관적 삶의 질에 관한 연구”에 서는 ‘65-69세’연령 군이 다른 연령보다 전반적인 삶에 대하여 만족하는 것으로 나타났으며, 특히 ‘80세 이상’연령 군 간에 통계적으로 유의미한 차이를 보았다. 이러한 선행연구를 종합해 볼 때 박숙(2003)은 노인교육에 참여하고 있는 노인과 비참여 노인의 생활 만족도에 대한 비교를, 박석돈(2001)은 교육 전· 후 노인교육의 효과성과 만족도를, 이순희(2001)는 교육효과 검정을 연구하다. 또한 정미·심미(2009)은 이용시설 참여노인을 대상으로 삶의 질 요인 을 분류하고, 고승덕·조숙행(1995)과 류용무(2009)는 삶의 질 향상을 위하여 삶의 질에 향을 미치는 주요 요소들을 분석하였으며, 김귀분·석소현 (2008)도 노인의 삶의 질과 관련된 요인들 간의 관계를 분석하다. 배나래 (2007)는 노년기 삶의 질에 향을 미치는 생태체계적 요인에 관한 연구를, 정명숙 (2005), 김미령(2006), 유정이(2006), 고보선(2003) 등은 연령에 따른 삶의 질에 관한 연구들을 했다. 하지만 노인교육을 받은 노인을 대상으로 삶의 질에 향을 미치는 요인에 대해 구체적인 연구가 미비하여 본 연구에서는 노인 교육을 받은 노인을 대상으로 인구사회학적 요인에 따른 삶의 질과 노인교육의 변인에 따른 삶의 질, 노인의 삶에 미치는 영향요인이 무엇인지를 알아보고자 한다. 또한 인구사회학적 특성변인에 따라, 노인교육 참여 변인에 따라, 전기노인과 후기 노인의 삶의 질에 차이가 있는지, 삶의 질에 유의한 향을 미치는 요인은 무엇인가에 대해 연구를 했다.

3. Methods

3.1 조사대상 및 자료수집방법

본 연구의 대상자는 노인복지관, 경로당 등을 중심으로 현재 노인교육 프로그램에 참여한 65세 이상의 노인들을 중에 Neugartion 1975 연령 분류를 따르고 연수노인, 중 고령노인, 고령노인 대상으로 조사를 실시하였으며 설문조사를 하기 위해 각 기관의 관장과 학장에게 연구목적과 취지를 설명하고 설문을 진행하였다. 총 250부의 설문지를 배부하여 240부를 회수하고, 그 중에 서도 설문의 응답자가 노년층임을 고려하여, 주요변인에 대해 미 응답 하거나 불성실하게 응답한 경우, 그리고 설문의 응답이 일관성이 결여된 부적절한 37부를 제외한 총 203부가 최종적으로 분석에 사용되었다. 또한 응답의 일관성을 검토하기 위해 동일 문항을 반복적으로 측정하다. 조사방법은 조사 대상자 스스로 기입할 수 있는 노인의 경우 자기 기입식으로 응답을 얻어내었다.

3.1.1 자료의 처리 및 분석방법

본 연구의 측정도구는 선행연구를 바탕으로 노인의 삶의 질에 영향을 줄 수 있는 인구학적 특성 변인과 노인교육 참여 변인을 구성하였다. 구체적인 측정도구는 다음의 <표 3-1>과 같다.

<표 3-1> 변수의 측정내용

변수구분	요인	측정변수	척도
종속변수	삶의 질	전반적 삶의 질	0~100 점
독립변수	인구학적 특성 변인	성별	더미(남 1, 여 0)
		연령	연령
		학력	6 점 척도
		배우자 유.무	더미(유 1, 무 0)
		자녀수	생존 자녀수
		종교 유.무	더미(유 1, 무 0)
	노인교육 참여 변인	주당 참여 횟수	횟수
		참여 기간	개월
		노인교육 필요도 리커트	리커트 5 점 척도
		프로그램 만족도	리커트 5 점 척도
		기관(시설) 만족도	리커트 5 점 척도

변수의 측정 내용을 보면 종속변수의 요인으로 삶의 질을 측정변수는 전반적인 삶의 질 및 척도는 100점을 하였다. 독립변수로는 인구학적 특성 변인 하였고 측정변수는 성별, 연령, 학력, 배우자 유무, 자녀 수, 종교 유 무, 항목으로 하였다. 노인교육 참여 변인으로는 주당 참여 횟수, 참여기간, 노인교육 필요도 리커트, 프로그램 만족도, 기관시설 만족도 등을 5점 척도로 측정을 하였다.

3.1.2 자료의 처리 및 분석방법

본 연구논문은 최종적으로 수집된 설문지를 부호화 작업(Coding)을 거쳐 SPSS 26.0을 이용하여 통계처리 및 분석하고 먼저 설문대상자들인 노인들의 일반적 특성을 살펴보기 위하여 빈도분석(Frequency analysis)과 (crosstabs)을 실시하였다. 그 다음으로

Coefficients ^a								
모델		비 표준화 계수		표준화 된 계수	t	Sig	공리 통계	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.223	.505		8.366	.000		
	성별	-.093	.066	-.102	-1.413	.159	.917	1.090
	연령	.032	.047	.049	.677	.499	.927	1.078
	학력	-.021	.036	-.043	-.587	.558	.906	1.104
	결혼 상태	-.043	.031	-.102	-1.377	.170	.872	1.147
	자녀 수	-.054	.026	-.150	-2.052	.042	.896	1.117
	종교	.058	.051	.082	1.127	.261	.913	1.095
	한 달 용돈	-.028	.037	-.055	-.755	.451	.906	1.104
	생활수준	.018	.042	.032	.437	.662	.916	1.091
	건강상태	-.142	.053	-.209	-2.671	.008	.777	1.287
	다니고 있는 기관에 대해 만족도	.111	.063	.138	1.776	.077	.789	1.267
	노인교육에 참여한 이유	.046	.032	.115	1.434	.153	.748	1.336

a. Dependent Variable: 만족도

Neugarten(1975)의 연령구분에 따라 연소노인(young-old)과 고령노인 (old-old) 간의 삶의 질의 차이가 있는지를 파악하기 위해 독립표본 T검정 (Independent Samples t-test)을 실시하다. 그리고 독립변수간의 유의한 상관관계가 있는지를 검토하기 위해 피어슨 상관관계수(Pearson's correlation analysis)을 구하고 그 유의성을 검정하였고 마지막으로 인구학적 특성 변인과 노인교육참여 변인이 노년의 삶의 질에 미치는 향을 파악하기 위하여 다중회귀분석(Multiple linear regression analysis)을 사용하여 통계를 내었다.

4. Results, data analysis

4.1 노인교육참여가 삶의 질에 미치는 영향

노인들의 인구학적 특성과 노인교육참여가 삶의 질에 어떤 영향을 미치는지 알아보기 위해서 다중회귀분석을 진행하였다. 인구학적 특성은 성별, 학력, 연령, 결혼 상태, 종교, 자녀의 수, 한 달 용돈 수준을 독립변수로 투입하였고, 노인교육참여는 노인교육 참여 횟수, 전체 참여 기간, 교육프로그램 필요성, 참여 기간, 교육 프로그램의 만족도, 노인교육 기관의 만족도를 투입하였다. 건강상태, 경제상태, 배우자와의 관계, 자녀와의 관계, 동년배와 자신 비교했을 때의 전반적인 삶의 질(행복감)을 종속변수로 투입하였다. 분석

결과는 R^2 가 0.121로 종속변수인 삶의 질을 약 12% 설명하고 있는 것으로 나타났다. 회귀모형의 유의성을 검정하기 위한 F검정 p값이 0.01보다 작아 회귀 모형이 통계적으로 유의하다고 볼 수 있다. 다중회귀모형의 다중공선성의 문제를 확인하고 VIF(variance inflation factor)값을 살펴보았다. 통계적으로 VIF값이 '5' 이상이면 문제가 있다고 판단하였다고 볼 수 있는데, 제 연구의 결과 VIF값이 '5' 이하 나타나 모두 다중공선성의 문제가 없다고 판단할 수 있다.

그리고 더빈-왓슨(Durbin-Watson) 값을 2.330로 나타나 잔차의 독립성 가정이 충족된다고 판단하였다.

<표 4-18> 노인교육참여가 삶의 질에 미치는 영향

모 델	R	R 스 퀘어	조정된		추정치의 표준 오 차	Change Statistics					Durbin- Watson
			R 스 퀘어	R 스 퀘어		R 스 퀘어	F	변 화	df1	df2	Sig. F 변 화
1	.347 ^a	.121	.049	.404	.121	1.683	15	184	.058		2.330

노인의 일반적 특성과 노인평생교육프로그램 참여 변인은 노인의 삶의 질에 어떤 영향이 미치는지 통계적으로 유의한 것으로 분석되었다. 성별의 경우가 남성보다 여성의 삶의 질이 높았는데 이는 허준수(2004), 이지연(2003)의 연구와 같았다. 또한 허준수(2004)의 연구와 같은 결과 나타났다. 이는 연령이 낮을수록 노인의 삶의 질이 높은 것으로 보인다. 그리고 노인은 교육프로그램에 참여하는 기간이 길수록 노인교육의 필요성에 공감하는 것이, 노인교육 프로그램에 만족하는 것이 삶의 질이 더 높은 것으로 분석되었다. 이와 같아 연령, 성별, 노인교육 참여하는 기간, 경제상태, 노인교육 프로그램 만족도, 노인교육의 필요성 등 변수는 노인의 삶의 질에 높은 영향을 미치는 것으로 나타났다.

5. Discussion, conclusion

평균 수명의 증가하고 노인들은 은퇴 후에 약 25-35년 정도 노년기 삶으로 보내게 되었다. 따라서 성공적인 노후생활이 보낼 수 있게 효율적이고 유익하게, 질적 향상 된 노년기의 삶을 설계하면 길어진 여가 시간이 생산적이고 효율적인 개념으로 변화되고 있다. 이에 노년기에게 노인교육이 필요하게 된 것이다. 노인교육은 노인들의 잠재 능력을 드러내고 그들이 지닌 다양한 기능과 지식을 후세대들에게 전달해 줄 수 있게, 동년배 간의 친교와 사회참여 및 건전한 여가시간을 보낼 수 있도록 해 준다. 그러므로 노인은 노년기를 건강하고 행복하게 보낼 수 있으며, 보다 효율적이고 유익한 고령의 생활을 제공함으로써 노인의 삶의 질이 향상되어 삶의 질을 높여 줄 수 있다. 본 연구에서는 노인의 삶의 질에 영향을 미치는 요인들 중에서 노인 교육이 중요한 요인으로 작용할 것으로 보고 현재 노인교육에 참여하고 있는 60세 이상의 노인들을 대상으로 노년기 삶의 질(만족

도) 향상에 미치는 영향을 연구하였다.

먼저 통계 분석결과를 살펴보면,

첫째, 조사대상자의 인구사회학적 특성요인 분석결과, 여성이 143명(70.4%)로 남성의 60명(29.6%) 보다 높은 비중을 차지하고 있었다. 일반적으로 여성의 기대수명이 남성보다 길게 보인다. 연령은 Neugarten(1975)의 연령구분에 따르면 연소노인이 45명(22.2%), 중고령노인이 121명(59.6%), 고령노인이 37명(18.2%)로 나타났으며 학력의 경우는 고등학교 8명(3.9%), 중학교 29명(14.3%), 초등학교 98명(48.3%), 서당 62명(30.5%), 무학 6명(3%)로 분석되었다. 결혼 상태를 확인한 결과, 유배우자가 119명(58.6%), 미혼 48명(23.6), 재혼 18명(9.4%), 사별 17명(8.4%)로 나타났다. 생존한 자녀수의 경우 2명이(66명32.5%), 1명이 (47명 23.2%), 3명이 (45명22.2%), 4명 이상이(27명, 13.3%), 현재 누구와 동거하는가를 살펴본 결과는 배우자와 함께 지내는 경우가 82명(40.4%)로 제일 높게 나타났고 그 다음에 미혼자녀 47명(23.2%)로 분석되었다. 종교는 개신교가 133명(65.5%), 은퇴 전의 직업은 자업 83명(40.9%)과 단순노무직 45(22.2%)로 나타났다, 한 달 용돈은 50만원-90만원 사이 167명(82.3%)로 가장 높게 나타났다.

둘째, 교육 참여 현황 분석 결과를 보면, 주2회 참여의 경우 95명 (47.3%)으로 가장 높은 빈도를 보였으며, 주3회 참여(12명, 5.9%)의 경우도 있었다. 노인교육을 받으신 전체 기간을 월 단위로 살펴본 결과, ‘3개월~6개월’이 96명(47.3%)로 가장 많았으며, 노인교육 참여 이유를 분석한 결과, 친구들을 만날 수 있어서가 110명(54.2%)로 가장 높게 나타났으며, 대부분의 노인들은 자발적으로 교육에 참여하는 것으로 보인다. 또한 노인교육에 참여하는데 가장 방해가 되는 것은 ‘없음’의 응답을 제외하고 건강은 (17명)을 가장 방해 요소로 나타나고 있는 것으로 판단하고 노인들이 건강에 대한 자신감이 부족하다고 분석되었다. 셋째, 연소노인, 중 고령노인과 고령노인의 삶의 질 차이를 살펴본 결과, 건강상태, 경제상태, 배우자와의 관계, 자녀와의 관계 만족도 평균에서 비교 보면 연소노인의 삶의 질이 높은 것으로 분석되었다. 다음으로 다중회귀분석을 통한 삶의 질에 미치는 영향 요인을 분석한 결과, 연령이 낮은 것, 노인교육에 참여한 기간이 길어진 것, 노인교육의 필요성에 공감하는 것, 노인교육 프로그램에 만족하는 것은 삶의 질이 더 높은 것으로 높게 분석되었다. 이는 앞으로도 노인들의 삶의 질 향상을 위해 노인들이 보다 건강하고 행복하게 노후 생활을 보낼 수 있도록 하기 위해서 노인교육이 더욱더 활성화 되어야 한다고 시사하고 있다. 특히 미래에는 현재의 노인들 보다 교육수준이 높고, 경제적으로 안정되고, 건강상태가 양호하고, 왕성한 활동력을 유지하고 있는 노인들이 늘어날 것으로 예상된다. 이러한 노인들을 위한 전문화된 교육도 고려될 수 있을 것이다. 이와 관련하여 퇴직 전 노후 준비 교육의 실시를 통하여 퇴직을 앞둔 고령자들이 미리 퇴직 후에 겪게 될 역할 상실과 그 밖의 경제적, 신체적, 정신적 변화를 극복하고 원숙한 노년기를 맞을 수 있게 해야 할 것이다. 그리하여 노인교육이 과거의 경험을 바탕으로 현재를 지혜롭게 살고 사회에 적응하여 보람을 찾으려는 노인들로 하여금 생애를 통한 인격형성이라는 차원 높은 교육 효과를 낼 수 있다고 판단한다. 이것은 바로 노인들의 삶의 질 향상으로 연결되는 것이다. 이를 위해 무엇 보다 필요한 것은 노인교육을 활성화하여 삶의 질을 향상시키기 위한 과제들을 살펴보아야

된다고 판단한다.

References

I. 국내 서적

(1) 단행본

권인택 2015. 평생학습사회와 평생교육방법. 서울: 교육과학사.

김한별, 2019, 평생교육론, 서울 : 학지사.

김동위, 2000, 평생교육개론 서울 : 교육과학사.

박성희, 2019, 평생교육방법론, 서울: 학지사.

신용주 2016, 평생교육방법론, 서울 : 학지사.

권인택, 2016, 평생교육경영론, 서울: 학지사,

임구원, 2020, 노인교육론, 서울 : 지식공동체.

이성균, 2019, 4차 산업혁명시대에 평생교육의 이해, 서울: 양서원

이훈구, 1997, 행복의 심리학 : 주관적 안녕. 서울: 법문사.

최운실 외4, 2018, 평생교육론, 경기 : 공동체

한상길, 2009, 평생교육론, 경기 공동체.

한상길, 2019, 평생교육론, 경기 공동체.

한정란 외, 2006, 세계의 노인교육, 서울, 학지사.

한정란, 2007, 노인교육의 이해, 서울, 학지사.

홍기형. 이화정. 변종임., 2001, 평생교육의 이해. 서울 : 교육과학사.

(2) 학위논문

고영화, 2007). 평생교육 프로그램개발 현상의 참여관찰 연구. 석사학위논문. 동의대학교 대학원.

고영화, 김진화 , 2007, 참여관찰 연구방법을 통한 프로그램개발 현상의 특성 분석. 평생교육학연구. 13(1),

고승덕, 1996, “노인의 삶의 질을 결정하는 요인 추출에 관한 연구”, 이화여자대학교 박사학위논문.

권영보, 2005, “노인일자리 창출사업의 개선방안에 관한 연구”, 대구대학교 석사학위 논문.

이정훈, 2013, 노인자원봉사활동 만족도가 심리적 안녕감에 미치는 영향. 성결대학교 석사학위논문.

이종호, 2016, 노인의 생활체육이 심리적 안녕감과 삶의 질에 미치는 영향 연구. 호서대학교 석사학위논문.

이묘숙, 2012, 노인의 경제 상태가 성공적 노화에 미치는 영향. 전북대학교 박사학

위 논문.

이상덕, 2004, 노년기 여가활동과 스트레스·삶의 질에 관한 연구. 고려대학교 박사학위 논문.

이선아, 2008, 취업노인의 생활만족에 영향을 미치는 직업만족 구성요인에 관한 연구. 성균관대학교 석사학위논문.

허선애, (2004), 「우리나라 노인교육과 개선방향의 모색」, 인하대학교 행정대학원 석사학위 논문,

한정란 외, 2008, ‘노인교육 체계화 및 활성화 방안연구’, 연구 보고서.

황영희, 2010, ‘고령사회에 대비한 대학개방을 통한 노인교육 연구’, 서울 기독교대 교대학원 박사학위 논문.

(3)인터넷사이트

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통계청 (<http://www.kostat.go.kr/>)

한국국립대학 평생교육원협의회 (<http://www.kula.or.kr>)

한국교육개발원 (<http://lifelong.kedi.re.kr/>)

OECD (<http://www.oecd.org/>)

대전시 유성구노인복지관 (<http://www.yesilver.or.kr/>)

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A Study on the Influential Factors of Internet of Things (IoT) to Realize Smart Home

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Abstract: Nowadays, Internet of things (IoT) technology is having an increasing impact on our daily lives, and it offers interesting and advantageous experiences to users. In addition, the researches in this field tends to focus on IoT design, architecture and implementation from the organizational point of view. little researches are having been conducted from the users' perspective. Considering the importance of attracting and retaining IoT users, therefore, it is necessary to identify the factors affecting consumers' IoT acceptance. Accordingly, this research aims to investigate the critical factor affecting attitude formation toward IoT and intention to use IoT. To achieve the goal of the study, the constructs including social, technical and individual context including social influence, ease of use, perceived risk, perceived enjoyment, and perceived convenience have been hired for better understanding and explanations on consumers' attitude formation toward IoT. For the empirical study, a survey was conducted from February 7 to 26, 2016 in Korea. A total of 358 questionnaires were collected over 20 days, and 322 questionnaires were used in the final analysis after statistical screening.

Key Words : Internet of Things, Smart Home, Social Influence, Ease of Use, Perceived Enjoyment, Perceived Convenience, Perceived Risk

A Study on the Effect of the Technology Commercialization Intelligence on the Productization Competence and Business Capacity

-Focusing on the Moderating Effects of Innovation Capability -

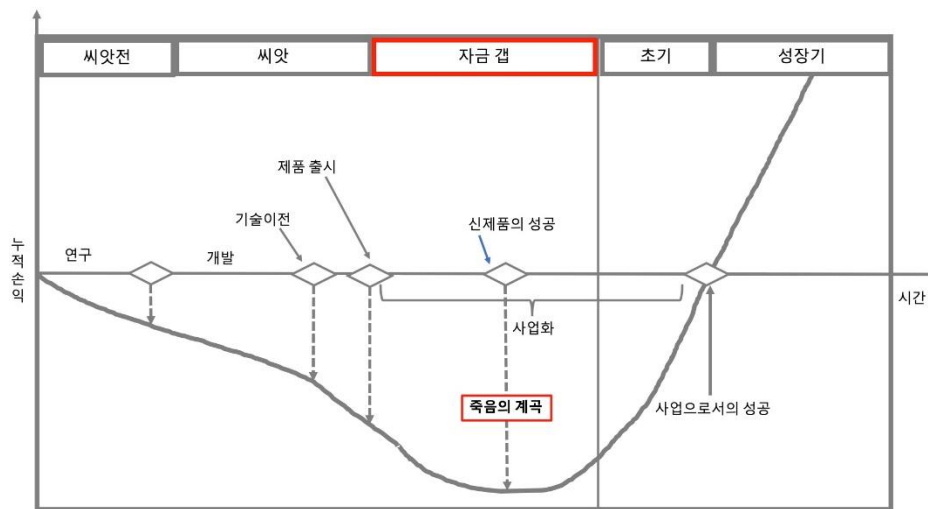
Ha Jang Su

Professor for industry collaboration purpose, Gyeongsang national university leaders in Industry-University Cooperation 3.0

I. 서 론

1. 연구의 배경

기술사업화(Technology Commercialization)에 대한 개념은 다양하게 정의하고 있지만 사전적 의미로는 “기술을 가지고 사업을 만들어 간다.”는 의미로, 활용하는 분야에 따라서 나타내는 내용이 통합된 방식으로, 포괄하는 영역적 의미에서 차이가 있다. 법률적 측면에서 보면 「기술의 이전 및 사업화 촉진에 관한 법률」제 2 조에서는 ‘기술을 이용하여 제품의 개발·생산 및 판매를 하거나 그 과정의 관련 기술을 향상 시키는 것을 말한다.’고 정의하고 있다(윤요한, 2015).



출처 :Kararm, S.(2014), Bridging the Valley of death. Sofia, Bulgaria

기술사업화는 무형자산형태를 가지고 있는 기술을 이용하여 유형의 상품으로 제품화하는 것과 관련된다. 보통은 아이디어 도출, 연구개발, 시제품제작, 시제품 검증 성능시험, 제품생산, 마케팅 및 이익창출 등의 프로세스를 거치게 된다. 기업들은 <그림 1-1>과

같이 기술사업화를 진행하는 과정에서 기술의 불확실성과 정보의 비대칭성 등으로 인해 ‘죽음의 계곡(Death Valley)’을 경험하게 된다.

기존 선행연구들을 기반으로 기술사업화 역량, 제품화 역량, 혁신역량, 사업화 성과에 대한 개념을 정의하고, 각 변수간 관계를 분석하고자 연구모형을 도출하였으며, 검증된 설문항목을 바탕으로 연구목적에 맞게 수정 보완한 설문을 통해 가설을 검정하기 위해 인터넷 서베이를 통한 조사를 통해 연구모형을 분석하고자 한다.

본 연구의 주요 구성내용은 기술사업화 연구 목적 달성하기 위해 다음과 같이 총 5장으로 구성하여 연구의 기본 방향성을 제시하였다.

제 1 장은 서론으로서 연구의 배경 및 목적, 연구 방법과 논문의 구성을 제시하여 본 연구의 기본방향을 정리한다.

제 2 장에서는 연구에 대한 이론적 고찰로 제조기업의 기술사업화능력, 기업성과, 제품화 역량, 혁신역량의 개념과 유형 및 선행연구 등을 설명하였다.

제 3 장에서는 연구모형 및 가설 설정, 조사 설계를 기술하였다.

제 4 장에서는 가설검증을 위한 연구의 기초자료 분석, 측정 변수의 신뢰도분석 및 탐색적 요인분석, 그리고 상관관계 분석, 연구가설 검증 등을 통해 연구 가설의 검증을 기술하였다.

제 5 장은 본 연구의 결론을 도출하기 위해 연구의 결과를 요약·정리하고, 연구의 한계점 및 향후 연구방향을 제시한다.

II. 이론적 배경

1. 기술사업화

1) 기술사업화 개념

기술사업화는 여러 학문 분야에서 논의되어 온 까닭에 다양하게 정의되고 있으며, 사업화 대상이 되는 기술을 창출하는 주제와 창출 단계 및 사업화를 주제에 따라 구분하여 규정할 수 있기 때문에 정형화된 범위로 정의하는 것이 가능하다. 일반적으로 기술사업화의 의미는 ‘기술을 이용하여 사용화 과정을 거쳐 부가가치를 창출하는 일련의 활동’을 의미한다(No et al., 2016).

우리나라의「기술의 이전 및 사업화 촉진에 관한 법률」에서는 기술이전 및 사업화에 대해 언급하고 있다. 기술이전은 양도, 실시권 허락, 기술지도, 공동연구, 합작투자 또는 인수·합병 등의 방법으로 기술이 기술보유자(해당 기술을 처분할 권한이 있는 자를 포함)로부터 그 외의 자에게 이전되는 것으로 정의하며(제 2 조), 사업화는 기술을 이용하여 제품을 개발·생산 또는 판매하거나 그 과정의 관련 기술을 향상시키는 것으로 ‘보유기술의 잠재적 가치를 실현하기 위해 기술을 이전하거나 생산과정에 적용함으로써 제품 및 서비스를 생산·판매하거나 그 과정에 필요한 관련기술의 향상에 적용하는

것'으로 포괄적인 의미로서 정의하였다(한국과학기술기획평가원, 2019; 구본철, 2014; 김헌수, 2015; 윤요한, 2015; 주완호, 2017; 성웅현, 2015).

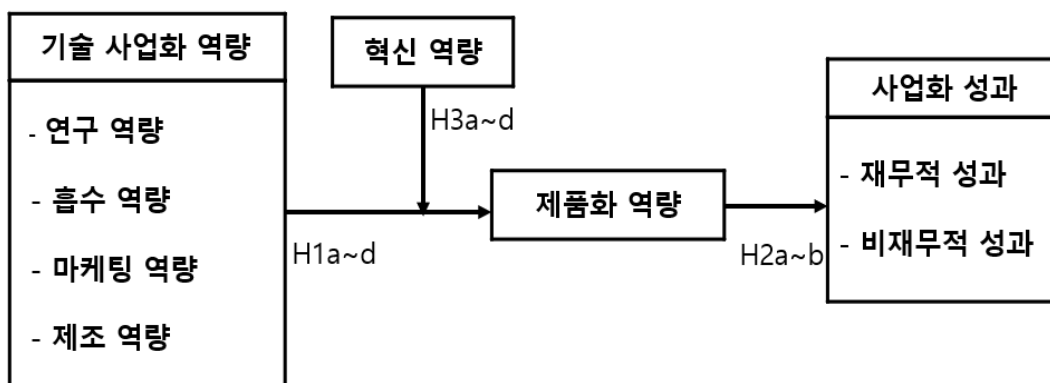
따라서 협의적 개념으로 '기술이전으로부터 일반적으로는 기술을 이용하여 제품을 개발, 생산 또는 판매하거나 그 과정의 관련 기술을 향상시키는 것'으로 정의된다(박웅, 2014; 손승우, 2012). 협의적 개념의 기술사업화 대상 기술범위는 특허, 실용신안, 소프트웨어 등의 지식재산은 물론 이들 기술이 집적된 자본재 및 관련 정보에 이르기까지 다양한 기술과 지식요소를 포함되며, 보다 넓은 개념의 기술사업화는 기술을 사업적인 목적으로, 즉 생산과 영리를 위한 경제활동에 활용하는 일련의 활동이라고 할 수 있다(박웅, 2014).

III. 연구모형 및 가설설정

1. 연구 모형

본 연구는 기업을 대상으로 기술사업화 역량(연구 역량, 흡수 역량, 마케팅 역량, 제조 역량)과 제품화 역량 및 사업화 성과의 영향 관계를 분석 하였다. 그리고 혁신 역량이 기술 사업화 역량과 제품화 역량에서 조절효과가 있는지 구분하여 분석 하였다. 본 연구 모형은 연구 목적을 달성하기 위해 독립변수인 기술사업화 역량을 연구 역량, 흡수 역량, 마케팅 역량, 제조 역량으로, 매개변수를 제품화 역량, 종속변수는 사업화 성과를 재무적 성과, 비재무적 성과를 구분하였으며, 조절변수는 혁신 역량으로 구분하였다.

기술사업화 역량과 관련한 선행연구들을 살펴보면 '기술의 이전 및 사업화 촉진에 관한 법률' 제 2 조에 의하면, 기술사업화는 기술을 이용하여 제품을 개발·생산 및 판매하거나 그 과정의 관련 기술을 향상시키는 것으로 정의된다(선승우, 2012; 임성희, 2021).



2. 연구가설 및 변수의 조작적 정의

본 연구의 목적과 주요내용은 기술 사업화 역량이 제품화 역량과 사업화 성과에 미치는 영향관계와 요인들을 분석하는 것이다. 또한 독립변수인 기술사업화 역량과 매개 변수인 제품화 역량 간의 관계에 있어 혁신역량의 조절 효과에 대하여 분석하는 것이다. 또한 독립변수인 기술사업화 역량과 매개변수인 제품화 역량 간의 관계에 있어 혁신역량의 조절효과에 대하여 분석하는 것이다.

이상의 선행연구를 기반으로 설정된 연구 모형을 중심으로 다음과 같이 영향관계 및 조절 효과를 검정하기 위해 선행연구를 기반으로 가설을 설정하였다. 추상적인 개념을 실증적, 경험으로 측정 가능하도록 구체화한 정의이다. 이 과정에서 본래의 의미를 모두 반영하지 못할 수 있으므로 조작적 정의(Operational Definition)는 개념적 정의(Conceptual Definition)를 벗어나지 않는 범위에서 측정 가능하도록 재 정의하는 것이어야 한다. 본 연구에서는 선행 연구에서 제시한 여러 개의 조작적 정의를 참고하고, 본 연구의 목적에 가장 적합한 것을 선택하여 사용하였다.

1) 기술 사업화 역량

기술사업화(Technology Commercialization)에 대한 개념은 다양하게 정의하고 있지만 사전적 의미로는 기술을 가지고 사업을 만들어 간다는 의미로, 활용하는 분야에 따라서 나타내는 내용이 통합된 방식으로 포괄하는 영역적 의미에서 차이가 있다. 법률적 측면에서 보면 「기술의 이전 및 사업화촉진에관한법률」 제 2 조에서는 ‘기술을 이용하여 제품의 개발·생산 및 판매를 하거나 그 과정의 관련 기술을 향상시키는 것을 말한다.’고 정의하고 있다(윤요한, 2015; 김정탁, 2020; 성웅현, 2015; 추완호, 2017). 기술의 사업화는 무형 자산형태를 가지고 있는 기술을 이용하여 유형의 상품으로 제품화 하는 것과 관련된다. 보통은 아이디어, 연구개발, 시제품 제작, 제품생산, 마케팅 및 이익 창출 등의 프로세스를 거치게 된다.

(1) 연구 역량

R&D 역량은 직접적으로도 간접적으로도 다른 역량에 영향을 주어 기업의 가치를 창출하게 된다. 동일한 자원을 투입하더라도 이를 운용 하고 적용할 수 있는 기술적 지식의 정도가 높다면 더 높은 기업가치 창출의 가능성이 있을 것이다. R&D 투자는 불확실성을 가지고 있으며, 긴 회수기간을 지니 고 있다. R&D 는 성공할 경우 기업의 높은 경영 성과를 확보할 수 있지만 실패할 경우 기업의 경영성과가 급격히 낮아지는 성향을 보인다. 이와 같은 불확실성과 투자 수익 회수의 장기성이 R&D 에 대한 집중적 투자를 어렵게 한다.

R&D 투자를 통하여 기업 내부 및 외부의 지식을 확보하거나 창출하여 혁신적인 제품이나 서비스를 도출하고 시장의 반응을 통하여 시장점유율을 제고하고 기업의 성과를 높이기 위하여 R&D 역량뿐만 아니라 기업의 다른 부문의 혁신역량도 고른 강화가 필요하다. 그러므로 기업 혁신역량이 성과에 미치는 영향뿐만 아니라 혁신 역량들 사이의 영향, 혁신 역량과 성과 사이의 타 혁신역량의 역할 등에 대한 분석을 통하여 한정된 자원의 효율적 배분 방안 마련이 필요하다.

기업의 R&D 는 혁신 창출을 위한 중요한 원천이며 기업의 장기적인 생존과 경쟁우위를 확보하기 위한 중요한 기업 활동이다.

(2) 흡수 역량

Cohen & Levinthal(1990)은 흡수역량을 "새로운 외부의 지식을 받아들이는 역량뿐만 아니라 사업화로도 활용할 수 있는 역량"으로 보았다. 따라서 흡수역량이 높은 기업은 외부의 지식을 받아들이고 활용함으로써 환경의 급격한 변화에서도 소기의 성과를 창출시키고, 향상시키며 생존할 수 있다고 언급하였다(Teece et al., 1997; Teece, 2007; 구철모 et al., 2008; Tzokas et al., 2015; 김수연, 2016).

흡수역량 개념을 처음으로 도입한 Cohen and Levinthal(1990)은 기업의 R&D 투자와 흡수역량 간의 관계에 관한 연구에서 흡수역량의 측정치로 R&D 집중도를 사용하여 흡수역량이 성과에 긍정적인 영향을 미치는 것으로 분석하였다.

(3) 마케팅 역량

마케팅 역량이란 경쟁기업에 비해 그 기업이 잘할 수 있는 상대적인 경쟁능력을 말한다(Prahalad and Hamel, 1990; 장세진, 2002; 박주영, 2011; 이홍균, 2014; 박해욱, 2015; 전인호, 2017). 이와 같은 정의를 준용하여 마케팅역량을 정의하면 “경쟁기업에 비해 그 기업이 잘할 수 있는 상대적인 마케팅 경쟁 능력”이라고 할 수 있다(박주영, 2011; 전인호, 2017; 이홍균, 2014; 박해욱, 2015).

이러한 마케팅역량을 파악하고 잘 활용함으로써 기업은 경쟁우위를 확보하고 지속적인 경영성과를 도출할 수 있게 된다(박주영, 2011; 박해욱, 2015). 그러나, 마케팅 역량은 무엇을 말하고, 그것이 기업의 경쟁우위와 경영성과에 어떠한 영향을 미치는지에 대한 개념적 정의와실증적 연구는 아직 활발하게 이루어지지 못하고 있다(박주영, 2011). 즉, 마케팅역량(Marketing Capability)의 개념에 대한 조작적 정의가 이루어지고 실제 연구에 활용된 것은 근래의 일이다(Vorhies and Harker, 2000; Vorhies and Morgan, 2005; 박주영, 2011). 마케팅 역량에 대한 구체적인 정의는 Day(1994)에 의해 최초로 이루어졌는데, 그는 마케팅 역량을 “기업의 집합적 지식, 기술, 자원을 사업의 시장친화적 요구에 적용하기 위하여 기업의 상품, 서비스에 가치를 부가하고 경쟁적 수요를 충족시키는 통합적 과정”이라고 정의하였다.

(4) 제조 역량

생산화능력은 생산설비를 구축하여, 고객이 요구하는 품질의 제품을 최소의 비용으로 적기에 공급하기 위해 합리적인 생산설비를 구축하여 제조설비를 운영하는 목적이다. 기업의 생산역량은 효율적인 제조와 물류체계의 확보 관계 측면에서 생산 활동을 효율적이며 자원 낭비를 최소화하는 기업의 운영역량으로 정의 할 수 있다(Krasnikov and Jayachandran, 2008; 이호택, 2018; 유정림, 2021; 박주영, 2011).

2) 제품화 역량

신제품이라는 용어에 대한 정의는 매우 다양하며 아직도 논의의 대상이 되고 있다. 일반적으로 좁은 의미의 신제품은 다른 제품이 아직까지 수행할 수 없었던 기능을 수행하는 제품을 의미한다

이상의 선행연구를 기반으로 기술사업화 역량과 제품화 역량간의 관계에 대한 가설을 다음과 같이 설정하였다.

3) 사업화 성과

구분	주요 측정척도	관련 선행연구
재무적 성과	매출액 증가, 영업이익 증가, 수익성 증가, 수익률 향상, 영업이익 증가율	최주윤(2014), 조영은 et al.(2018), 노재욱(2019), 정부일(2019), 성필석(2019), 강성천(2020) 등
비재무적 성과	신제품 출시, 제품 경쟁력 향상, 불량률 감소, 제품 개선과 성능 향상, 신제품 개발 건수	최주윤(2014), 황경연 et al.(2014), 정부일(2019), 성필석(2019) 등

4) 혁신 역량

혁신이라는 용어를 처음 사용했던 Schumpeter(1934)는 혁신을·신규의 혹은 기존의 지식, 자원, 설비 등의 새로운 결합'으로 정의하고, 그 내용을 ① 아직 소비자에게 알려지지 않은 새로운 제품과 새로운 품질의 개발, ② 새로운 제조방법의 도입, ③ 새로운 시장의 개척, ④ 원료 및 반제품 공급원의 확보, ⑤ 새로운 조직의 실현 등으로 구분한 바 있다. 가설 H3. 기술 사업화 역량은 제품화 역량간의 영향관계에서 혁신 역량의 조절 효과가 있을 것이다.

IV. 실증분석

구분		빈도	백분율(%)
성별	남자	208	66.0
	여자	107	34.0
나이	20~29 세	17	5.4
	30~39 세	81	25.7
	40~49 세	122	38.7
	50~59 세	82	26.0
	60 이상	13	4.1
학력	고졸	49	15.6
	전문학사	31	9.8
	학사	188	59.7
	석사	43	13.7
	박사	2	.6
	기타	2	.6
창업경험	없음	226	71.9
	준비 단계	31	9.8
	1 회	35	11.1
	2 회 ~ 4 회	20	6.3

	5 회	2	.6
	6 회 이상	1	.3
현 사업장 직위	대표	4	1.3
	임원급	11	3.5
	부장급	51	16.2
	차장/과장급	103	32.7
	대리/사원급	139	44.1
	기타	7	2.2
지역별	서울	112	36.6
	경기/인천	77	25.2
	충남/충북/대전/세종	26	8.5
	전남/전북/광주	28	8.9
	경북/대구	32	10.2
	경남/부산/울산	31	9.8
	강원	9	2.9
	제주	0	0

1. 상관관계분석

	독립변인				매개변인	종속변인		조절변인
	연구역량	흡수역량	마케팅역량	제조역량	제품역량	재무적성과	비재무적성과	혁신성역량
연구역량	-							
흡수역량	.686***	-						
마케팅역량	.780***	.697***	-					
제조역량	.770***	.707***	.844***	-				
제품역량	.727***	.655***	.775***	.849***	-			
재무적성과	.746***	.608***	.716***	.746***	.742***	-		
비재무적성과	.645***	.639***	.735***	.770***	.731***	.758***	-	
혁신성역량	.745***	.643***	.722***	.755***	.739***	.800***	.766***	-

Pearson's Linear Correlation Coefficient(r), ***p<.001

2. 가설검정결과

1) 기술사업화 역량과 제품화 역량간의 관계 가설검정 결과

가설 1 인 “기술 사업화 역량은 제품화 역량에 유의한 영향을 미칠 것이다.”에 대한 가설 검정을 위하여 독립변인으로 기술 사업화의 하위요인인 연구역량, 흡수역량, 마케팅 역량, 제조역량을 투입하고 종속변인에 제품화 역량을 포함하여 다중회귀분석을 실시하였다. 가설 1의 하위가설은 다음과 같다.

독립변수	종속변수	비표준화 계수		표준화 계수	t	p	결과	공선성 통계량	
		B	표준오차	베타					
	(상수)	.326	.116		2.804**	.005		공차	VIF
연구역량	제품역량	.106	.045	.120	2.366*	.019	채택	.327	3.059
흡수역량		.061	.054	.054	1.123	.262	기각	.368	2.716
마케팅역량		.126	.058	.130	2.182*	.030	채택	.235	4.258
제조역량		.611	.060	.606	10.212***	.000	채택	.239	4.190
R2=.740, F=220.141***									

*p<.05 **p<.01 ***p<.001

2) 제품화 역량과 사업화 성과간의 관계에 대한 가설검정 결과

독립변수	종속변수	비표준화 계수		표준화 계수	t	p	결과
		B	표준오차	베타			
제품역량	(상수)#	.411	.139		2.953	.003	
	재무적성과	.835	.041	.758	20.530	.000	채택
제품역량	(상수)##	.915	.119		7.686	.000	
	비재무적성과	.728	.035	.764	20.941	.000	채택
모형 1#: R ² =.547, F=421.465, 모형 2##: R ² =.584, F=438.523							

*p<.05 **p<.01 ***p<.001

3) 기술사업화 역량과 제품화 역량간의 관계에서의 혁신역량의 조절효과에 대한 가설검정 결과

	Model1		Model2		Model3	
	B	β	B	β	B	β
(상수)	.326		.246		.967	
연구역량(A)	.106	.120*	.056	.063*	.707	.798**

흡수역량(B)	.061	.054	.035	.031	.055	.049
마케팅역량(C)	.126	.130*	.110	.114	-1.027	-1.066***
제조역량(D)	.611	.606***	.554	.549***	.788	.781**
혁신역량(E)			.174	.174***	-.063	-.063
A*E					-.201	-1.272**
B*E					.002	.009
C*E					.349	2.116***
D*E					-.076	-.480
R ²	.740		.750		.774	
F(p)	220.141***(.000)		.185.697***(.000)		116.379***(.000)	

*p<.05 **p<.01 ***p<.001

V. 결 론

1. 연구의 결과 요약

본 연구에서는 기업의 기술사업화 역량과 기술사업화 경영성과간의 관계를 알아보기 위하여 제품화 역량을 통한 기술사업화 성과와 기술사업화 역량의 제품화 역량에 대한 혁신역량의 조절효과를 확인함으로써 제품화 역량과 혁신역량의 중요성 및 그 필요성을 입증하기 위하여 그 연구목적이 있다.

선행연구를 바탕으로 기술사업화역량을 연구역량, 흡수역량, 마케팅역량 및 제조역량으로 구분하여 독립변수로 투입하였고, 기술사업화 성과(재무적성과, 비재무적성과)를 종속변인으로 설정하였으며, 매개변인으로 제품화 역량을, 기술사업화 역량과 제품화 역량간의 조절효과로 혁신역량을 투입하여 최종연구모형을 설정하였다.

연구결과를 종합하면 다음과 같다. 첫째, 기업의 제품화 역량은 연구역량, 마케팅역량, 제조역량이 제품화역량을 주요한 영향요인임을 알 수 있으며, 특히 제조역량이 다른 기술사업화 역량보다 제품화 역량 향상에 두드러진 효과가 있음을 확인하였다. 둘째, 제품화 역량은 재무적 성과와 비재무적성과에 모두 주요한 영향을 부여되며, 비재무적 성과에 영향이 비재무적성과보다 조금 더 높은 수준이었다. 셋째, 혁신역량의 기술사업화 역량과 제품화 역량간의 조절효과를 살펴본 결과, 혁신역량은 매우 제품화 역량에 주요요인으로 작용하며, 특히 연구역량의 경우는 혁신역량과 반비례적인 역할을 하여 연구역량을 강화할수록 제품화 역량을 강화할 수 있지만 혁신역량이 강한 기업인 경우는 도리어 제품화 역량을 도태시킬 수 있는 역량임이 나타났다. 그러나 마케팅역량의 경우는 기업의 혁신이 기업의 제품화 역량을 강화시키는 요인으로 작용함을 알 수 있다. 넷째, 흡수역량은 제품화 역량에 주요요인이 되지 못하며, 혁신역량에 의한 조절효과도 없는 요인으로 나타났다.

Taking into account the psychology of digital generation in learning process

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Хураангуй: Хил хязгааргүй харилцаа холбооны эринд суралцаж буй Z үеийнхнийг сургах үйл явц нь өөрийн гэсэн онцлогтой. Багшийн өнөө үеийн сургалтын арга зүй, багшлах ажлын ажлын сэтгэл зүйн мөн чанар болон дижитал үеийнхний сэтгэл зүйг сургалтын явцад хэрхэн хөгжүүлэх мэдлэгт төдийгүй хандлагыг илүү тооцон ажиллахын ач холбогдлыг чухалчлан авч үзлээ. Z үеийнхний хувьд технологи амьдралынх нь ердийн хэв маяг.

Түлхүүр үг : дижитал орчин, Z үеийнхэн, багшлахуй, суралцахуй

1. Оршил

Монгол Улсын төрөөс боловсролын талаар баримтлах бодлого багц хуульд: Суралцагч бүрийг өөртөө итгэлтэй, бүтээлч иргэн болгон төлөвшүүлж мэдлэгт суурилсан нийгмийг бүтээн байгуулах дэлхийд өрсөлдөх МОНГОЛ ХҮН-ий төлөө хэмээн тодорхойлсон. Монгол Улсын Хөгжлийн үзэл баримтлалд: (Алсын хараа 2050) ... боловсролыг хувь хүний хөгжил, гэр бүлийн амьдралын баталгаа, улс орны хөгжлийн суурь болгон насан туршдаа суралцахуйн тогтолцоог бэхжүүлнэ гэж заасан.

Иймд Суралцах чадвар: мэдлэг ойлголт, чадварын гүйцэтгэл (амжилт) –ыг голчлох уу?

Сургалтад хандлага (сонирхол, идэвх, оролцоог) хамтад нь авч үзэх үү?

Сургууль бол суралцагчдад зөвхөн мэдлэг эзэмшүүлдэг газар биш бүх талын боловсролыг цогцоор олгодог. Багш суралцагчдынхаа сэтгэцийн хөгжлийн зүй тогтол болон зан үйл төлөвшилд нөлөөлөгч хүчин зүйлийн талаар мэддэг байх

Дэлхий ертөнцийг харах сэтгэлгээний шинэ хэв маяг, зан үйл, хандлага. Тэдгээрийг өөрийн болгож чадах, үгүйн асуудлыг чухалчилж байна.

Дижитал эриний суралцагчид нь Туршлагаас илүү чадварыг чухалчлан үздэг. Зоримог, өөдрөг шинж чанартай. Тэдний анхаарлын төв нь хиймэл оюун ухаан. Ур чадвар, өөртөө болон ирээдүйдээ итгэх итгэл өөдрөг зантай. Хараат бусаар, бие дааж ажиллахыг эрмэлздэг. Өрсөлдөөнд дуртай Шинийг эрэлхийлдэг Цалин сайтай ажлын байрыг чухалчилдаг зэрэг онцлогтой.

Сурах нь өөрөө суралцахуйг шаарддаг. Өөрөөр хэлбэл, Хүн яаж сурах вэ? Багш заахаасаа илүү яаж сурах вэ? гэдгийг л зааж сургах асуудал бидний анхаарлын төвд байна.

Хүн юмыг ухамсартайгаар, зорилготойгоор сурдаг гэж боддог.

Хүн ухамсартай болон ухамсаргүйгээр байнга сурч, суралцдаг.

Зөв зүйлийг сурч байна уу? Буруу зүйлд суралцаад байна уу? гэдгээ үнэлж сурахад сургах нь энэ эринийхний эзэмшлэл зохих зайлшгүй хандлага мөн.

Иймд багш та нас насны хүмүүсийг удирдан, хамтран ажиллах, санаа нэгдэн ажиллахын ашиг тусыг хүртэх, залуусын эрч хүч, төлөвшсөн хүмүүсийн мэргэн арга ухааныг хослуулан мэргэжлийн харилцааг бий болгох шинэчлэлийн ач холбогдлыг хүлээн зөвшөөрч, дасан зохицож, тасралтгүй хөгжих нь зүйтэй.

2. Дүгнэлт

1. Багш суралцагчдынхаа гадна талд илэрч байгаа ялимгүй өөрчлөлтөөр тэдний дотоод сэтгэлийг ойлгодог, насны болон сэтгэл зүйн хувийн онцлогийг харгалзан тэдэнтэй хамтран ажилладаг байх. Тэдний хөгжлийг ямар түвшинд байгааг мэдсэнээр сурах/сургах үйл ажиллагаа оновчтой, үр дүнтэй болно.
2. XXI зуун бол сэтгэлийн зуун. Суралцахуй нь чадвар болон хүмүүнлэг харилцааг төлөвшүүлнэ. Мэдлэг, чадвараа нийгэм, бодит амьдралд хэрэглэх болно.
3. Сэтгэн бодох, шийдвэр гаргах, илэрхийлэх, урьдчилан төлөвлөж, өөрийн удирдлага зохицуулалттай суралцахуйг дэмжин хөгжүүлэхэд анхаарах нь зүйтэй.

Misheel Institute for Young Research 5TH International Conference MIYR – 2023

2023.05.25 Print

Editor1: Gantumur Khongorzul

Editor2: Batmunkh Shurentsetseg

Printing Agency: Green Book

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