

**The feasibility study for introducing green economic concept into curriculum of
selected universities**

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Study proposal and work plan

The overall objective of this study is to identify gaps, assess training needs and explore options relating to the inclusion of Green Growth knowledge and tools in universities in Mongolia. The results will help with the design and delivery of training and education materials, capacity building for lecturers and researchers, and the implementation of a Green Growth curriculum in universities.

Specific objectives:

- 1) Assess the status of Green Growth education in selected Mongolia universities by undertaking a gap analysis, which will evaluate the extent and manner in which selected Green Growth and green finance concepts, issues and tools are incorporated into university curricula, and which will refer to international examples;
- 2) Conduct a needs-assessment of lecturers, researchers and students with respect to the selected Green Growth concepts, knowledge and tools;
- 3) Building on the gap analysis and training need assessment, propose and analyse options for improving Green Growth education in the selected universities, including: mainstreaming concepts into existing courses and programs; the creation of new courses; and explore potential cost-recovery and financing of the Green Growth education options listed.

Scope of Work

The study is composed of three phases: an Inception Phase during which the scope is decided and the questionnaires and research activities are finalized; a Survey Phase where information and feedback is collected; and an Analysis Phase, which completes the analysis

of data, complemented by desk research, and finalizes all deliverables. However, it is expected that desk research and analysis will begin from the start of the project.

The study has three main components, which are all contained in the Final Report on the Green Growth Education Baseline and Options in Mongolia.

The first is the Baseline Component, complemented by a Gap Analysis. This sets out a range of potential Green Growth topics, and evaluates to the extent to which they are reflected in Mongolian university curricula.

The second are the Needs Assessments. These will assess the needs of professionals the universities and the capacity building needs of lecturers, as well as the needs of students. These needs assessments taken together will help inform the prioritization of topics for Green Growth education and training over the short-, medium- and long-term, as well as the capacity needs of trainers/lecturers.

The third, Options Analysis will investigate how certain Green Growth topics can be delivered (via courses, degrees, mainstreaming topics into existing programmes, etc.) and will acquire feedback from university faculties and students, as well as refer to international examples where applicable, and evaluate the feasibility of the various options.

Research Design

The curricula under review are based in the four universities of the Mongolia, namely the National University of Mongolia, University of Finance and Economics, University of Life Science and the Mongolian University of Science and Technology.

These Universities play a critical role in developing and transferring skills and knowledge through education, training and research.

The research process was designed around key steps in a gap and content analysis. The first phase dealt with data collection on the four universities in the Mongolia. This involved identification of the curriculum and programmes in the four universities related to green economic concept and green finance. The assessment framework involved analyzing programmes through their faculty handbooks and online course descriptions. The second phase involved a thorough literature review of both local and international documents related to aspects of a green economy and green finance, then focusing particularly on needs assessment.

Educational Design

Bachelor degree programs at selected four universities are delivered in accordance with the Law on Education, Law on Higher Education, by-laws, rules and procedures issued by the Ministry of Education, Science, Culture and Sports in compliance with the above mentioned national laws. The Academic Affairs Office on Bachelor degree programs - with support and input from relevant professional departments - develops, approves and implements curricula, syllabuses and standards on undergraduate degree programs.

Curriculum Design

Curriculums have at least 120-130 contact hours of instructions in selected four universities consisting of general education, professional and specialized courses. It includes sessions on theory as well as seminars/practicums. One credit hour equals to 48 hours for 16 weeks term.

General education courses have at least 28-36 contact hours of instructions, both for compulsory and elected courses in each university. Professional core courses have 9-36 contact hours of instructions, and all courses are compulsory. Specialization courses have at least 39-66 contact hours of instructions, and consist from compulsory and elected courses in selected universities.

Table 1. Credit hours

	NUM	MLSU	UEF	MUST
General education course	36	33	28	36
Professional core course	9	30	36	36
Specialization course	60	63	66	39
Elective course	15			
Practice				6
Thesis defense	3			5
Total	120	126	130	122

Sessions are organized in 3 or 2 credit hours of instruction. A 3 contact hours' session consists of 64 hours of lectures and seminars in one term. All major courses, majority of specialized courses, all general education compulsory courses and elected courses are taught in 3 contact hours..

The curriculum includes compulsory and elected general education courses aimed to provide the students with the fundamentals of scientific knowledge required for degree studies, to teach speaking and writing skills, skills necessary for analysis of both quantitative and qualitative information, cognitive skills, effective communication and cooperation skills, and the ability to learn from other's experiences. Content of the general education courses is defined in line with the procedure approved by the Minister for Education and Science and some subjects that may be included in relevant professional courses can be added.

The majority of the above mentioned general education courses are aimed to teach communication and critical thinking skills.

Professional core courses are designed to provide the students with basic scientific knowledge on core subjects of study, to learn problem solving skills and creative thinking, as well as professional ethics and basic exposure to relevant sector laws.

Specialization courses are intended to give specific scientific knowledge, skills and competencies through compulsory and elected subjects.

Thesis defense: This is not required for all students. If a student has more than a 3.0 GPA scores during his/her study duration, she/he may write a diploma thesis and defend it at the end of their program. Student scores are calculated into the student's GPA or considered part of the student's academic degree program. She/he also gets 3 credit hours. This thesis defense assesses the student's abilities (at doing research, analyzing and interpreting data and information, etc.) and knowledge (concepts and principles of the main field) on specific topics within the major field of study.

The procedure of including new course and changing syllabuses into program curricula

Relevant professional departments propose amendments and changes based on requests from partner organizations and stakeholders as well as the analysis of teaching activities. In some cases amendments and changes can be made by the decision of the Ministry of Education and Science, Vice President of the NUM, the NUM Academic Affairs Office on Bachelor Degree Programs, etc.

The procedure specifies steps that should be followed to make changes to program curricula and syllabuses. According to this procedure, the Academic Affairs Office on Bachelor Degree Programs develops the first draft of program curricula and syllabuses. Program curricula, syllabuses and requirements are developed in consultation with professional departments, academic staff, graduates and employers and in compliance with relevant professional standards. And then these are reviewed by Academic Affairs Offices

of universities. In case of NUM, curricula and syllabuses are reviewed by Program Committee. And then The Academic Council then issues its conclusion, and the draft is later approved by the President of NUM with the consent of the Ministry of Education and Science.

In the case of changes to curricula - professional departments submit their proposal to the Academic Council, and the Academic Affairs Office on Bachelor Degree Programs makes a final decision based on its opinion. Changes to curricula content and other major changes can be made once in four years, while changes that do not have significant impact on students' learning process (such as changes in course name, index, and/or course coherence) can be made once in two years.

Gap and content analysis for economics program

In case of Economics program of NUM and Agricultural and applied economics of MULS offering Environmental economics and Resource economics for undergraduate students by elective courses. In case of Business economics program of UEF, department offers only one course which is named by Environmental and natural resource economics. Currently Humanity and Business school of MUST does not have economics program for undergraduate level. So gap and content analysis are done for comparing related courses of three universities.

In case of textbooks, there are not any general criteria or requirements for the selection of textbooks and handouts, each department makes its selection of texts and reading materials based on its own approach and experiences. Lists of core and supplementary texts and reading materials included in the training package, are discussed and approved by the department and are introduced to lecturers. Lecturers teaching the same course agree on texts and reading materials for inclusion in the training package. Because of the text books and reading materials are not written in Mongolian language, lecturers use texts widely used in international universities in foreign languages. For instance, "Environmental and natural resource economics" 9th edition by Tom Tietenberg and Lynne Lewis is used in

the environmental economics course, "Resource economics" 2th edition by Jon M. Conrad in the core course on Resource economics and so on.

Box 1. Course description : Environmental economics

By the this course students will obtain an understanding for historical background of environmental economics and interrelationship between environment and economy and sustainable development and theoretical views on sustainability. And also students will obtain knowledge about how to do economic activities optimally which are less environmental pollution and degradation on environment, how to allocate resources optimally. Under the lecture of environmental valuation methodologies, students will learn main tools and methodologies such as environmental valuation methods and impact assessment. Final several lectures of this course will be devoted to explain intertemporal and intra-countries resource's optimal allocation, utilization and how to define renewable and nonrenewable resource's optimal extraction level.

The goal of this course is to orient students with topics in Environmental Economics, the analytical techniques that policy makers adopt and the general problem solving skills. Student will be able to analyze basic environmental issues with economic methods and tools while strengthening team working and research skills at the end of the course.

The content relating to green economy topics and themes as identified in Table 1 and these are compared with the outline of selected courses of universities.

Once a summary of all the themes relating to green economy content, which were present in course outlines are classified by "completely", "partially" or "insufficiently" represented. Complete representation required that the theoretical framework topics were

fully reflected in course syllabuses. Partial content representation entailed content only being added as extra information and briefly discussed. Insufficient representation meant that the content was lacking in its entirety. Also, the representation of the data was only classified as complete representation if the theoretical inclusive green economic issue were fully reflected in syllabuses of selected courses.

Table 1

	Economics program, NUM	Business economics program, MULS	Agricultural and applied economics program, UFE
Related concepts to Green Growth: Sustainable development, Green development, Green economy, Low-carbon Development, Inclusive Green Growth	Partially	Partially	partially
Main economic sectors and greening the national economies	Partially	insufficient	partially
Indicators to measure green growth progress	partially	partially	partially
Challenges and opportunities for greening key economic sectors	insufficient	partially	partially
Resource mobilization and financing for Green growth investments and programmes	insufficient	insufficient	insufficient
Economic instruments and policies for the environment and sustainable investments	completely	completely	completely
Mainstreaming environment into development planning	partially	partially	partially
Climate change mitigation and adaption	partially	partially	partially
Fiscal Instruments: Green/Carbon/Environmental Taxes	partially	partially	insufficiet

Integrated economic modelling	insufficient	insufficient	insufficient
Environmental Harmful Incentives	Insufficient	insufficient	partially
Budget reform and mobilization for Green growth	insufficient	insufficient	insufficient
Source of Green House Gases (GHG) Emissions	completely	competely	completely
Measures to reduce energy consumption	partially	partially	partially
Renewable energy	partially	partially	insufficient

The analysis results revealed the majority of inclusive green economic topics to be partially represented in the course outline, while a few were completely represented (Table1). For example, green growth concept, financing green growth, integrated economic modelling, environmental harmful incentives, green budget reform and renewable energy topics are not reflected in current course outlines of selected universities.

The interviews of lecturers

The following section will address the second phase of data analysis, i.e. the inductive analysis of the interview transcripts .

The interviews were used to explore and clarify the syllabuses’ gap and content analysis results. The following questoins are used to clarify and reveal the opinions of lecturers.

- To what extent does the your schoool’s curriculum integrate green economy content?;
- To what extent do your school’slecturers understand green economy and its implementation?;
- What are your school’s lecturers opinions regarding toreflecting green growth concept and green finance into curriculum?

Questionnaires were given to 8 lecturers of selected universities to capture their opinions on the extent to which green economy content topics are present in the curriculum as well as their understanding of green economy and its implementation.

The results of the lecturers' views will be addressed according to the five green economy areas identified in the theoretical framework: inclusive green growth concept, green economic sectors, energy and recycling and integrated green economic modelling.

The analysis of the questions related to inclusive green growth concept revealed that most of the lecturers agreed that the syllabuses include content on green growth concept partially. Sixty percent (6 out of 8) of the lecturers agreed that the course syllabuses do not include content on green economic sectors, while 40% (2 out of 8) agreed that some economic sectors such as tourism, water and energy were prescribed.

On energy and recycling, 25% (2 out of 8) of the lecturers agreed that the curriculum prescribes content on recycling, while 75% (6 out of 8) participants indicated that course syllabuses do not prescribe content on the necessity of recycling and energy efficiency and renewable energy issues.

All of the participants indicated that the syllabuses do not include content on integrated green economic modelling and indicators.

Also, none of the lecturers (8 out of 8) said that green economy content is completely represented in the syllabuses. One lecturer summarised it as follows:

Lecturer: "Partially to incompletely. Either nothing is prescribed, or when it is prescribed it's mentioned briefly, maybe an assignment for research is given, nothing beyond that."

Sustainability of natural resources, resource management, pollution and policy instruments were content areas mostly mentioned by lecturers. Also, two of the eight lecturers commented that although content on environmental problems was prescribed, students

were being taught how to solve numerical problems, but not were being taught by real discussion and critical thinking.

In accordance with the interviews revealed that lecturers thought green economic issues to be incompletely reflected into the syllabuses.

The lecturers of selected universities who participated in the interviews often revealed great similarities in gap and content analysis of syllabuses and curriculums.

Some of the lecturers mentioned that their school's prescribed textbook contains no content on green economy, while another mentioned that their prescribed textbook discusses it quite extensively. A further implication is that, as there are various different textbooks, a large variety of versions of the green economic content is being taught.

The questionnaire and interview revealed that although the lecturers indicated that they would feel comfortable teaching about green economy, they are not yet fully cognisant of what a green economy entails, especially in terms of inclusive green economic growth, green economic modelling and green jobs. Topics which relate to green economy, such as green economic indicators, integrated economic modelling, energy efficiency and minimizing ecological and carbon footprint and the like, are not being taught by lecturers in the classroom.

Most of the lecturers mentioned that it is better way to introduce and design new course for green economic concept rather than introducing green economic concept into the existing courses.

Gap and content analysis for Financial curriculum and syllabuses

The content relating to green loan and sustainable finance' topics and themes as identified in Table 2 and these are compared with the outline of selected courses of universities.

Table 2

	Economics program, NUM	Business economics program, MULS	Agricultural and applied economics program, UFE	
Related concepts to Green Growth: Sustainable development, Green development, Green economy, Low-carbon Development, Inclusive Green Growth	insufficient	insufficient	insufficient	insufficient
Green loan	insufficient	insufficient	insufficient	insufficient
Green business	insufficient	insufficient	insufficient	Insufficient
Green tax	insufficient	insufficient	insufficient	Insufficient
Green investment	insufficient	insufficient	insufficient	Insufficient
Green finance	insufficient	insufficient	insufficient	Insufficient
Global and national green finance market	insufficient	insufficient	insufficient	Insufficient
Foreign and national green fund for mitigating climate change and degradation of environmental quality	insufficient	insufficient	insufficient	Insufficient
Government green procurement and purchasing	insufficient	insufficient	insufficient	insufficient

The analysis results revealed the majority of green loan and sustainable finance topics to be insufficiently represented in the course outline. It means that most of the topics are not reflected in current course outlines of selected universities. But when I was doing interview with some lecturers, some of them mentioned that few of topics are just briefly mentioned in lecture time.

Survey result among the students

This questionnaire has involved 60 students from the third course by the specialty of Economics and 40 students by the specialty of Finance. The objective of the present survey

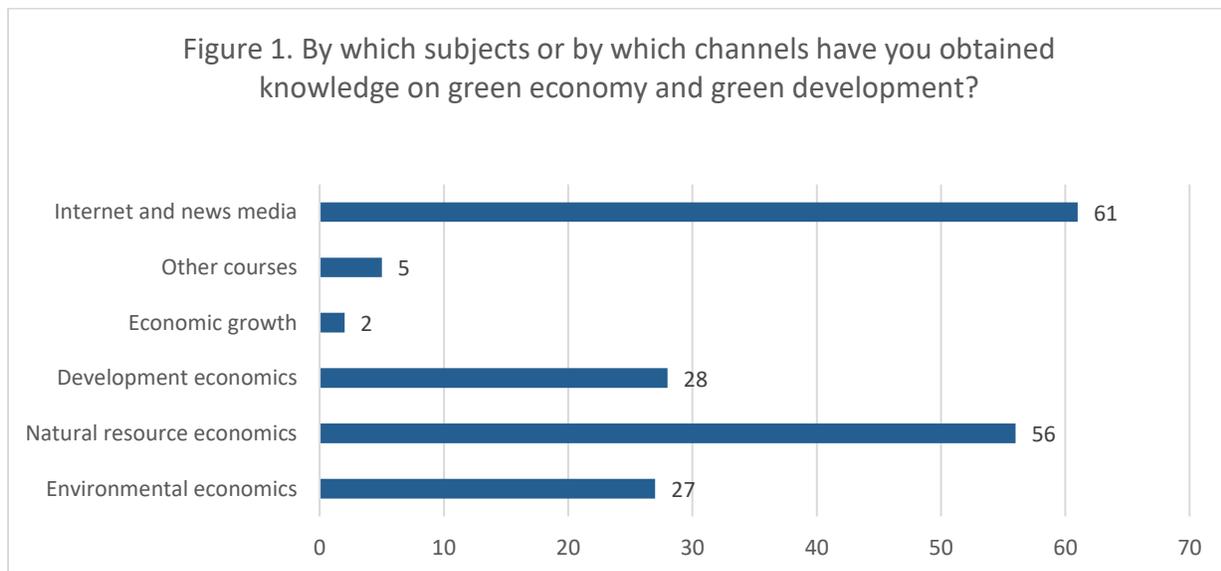
is to research knowledge of students on green economics, green loan, and sustainable finance and to find out their ideas to involve these topics into the training programs and curricula.

Every questionnaire has 5 questions. We have chosen students from the third course (level) because we had to clarify 1) if they had certain knowledge on these topics during their other subjects in the first and second courses; 2) whether they want to research these subjects in furthers if they do not have knowledge in these fields.

First, I would like to introduce results of the questionnaire among students by the specialty of economics.

Figure 1 shows the results of the first question “How/ through which subjects or channels have you obtained knowledge on green economy and green development?”

From the bar chart, it can be seen that 61% of the students surveyed answered they



gained knowledge from internet and information channels while 56% - from natural resource economics classes, 28% - from Development economics classes, and the rest 27% - from Natural resource economics classes, respectively.

However, a question “How do you estimate the obtained knowledge?” was answered as follows:

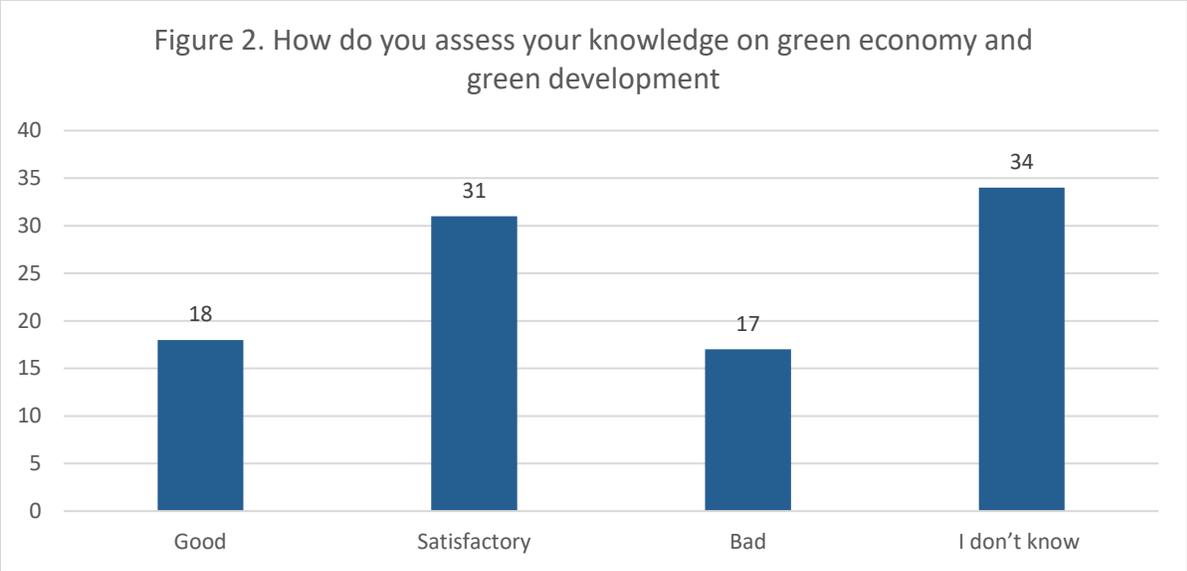


Figure 2 compares the percentage of self-assessment of the students for their knowledge on green economy and green development. Just over a third of the students answered “I don’t know”, 31% chose an answer “Sufficient”, 18% gave “Good”, and 17% provided “Bad” assessments, respectively. The cumulative percentage of “I don’t know” and “Bad” answers makes up 51%. This result might show that lecturers do not use the terms of green economy and green development in during their classes sufficiently.

Figure 3 shows the percentage of students defining which topics were discussed in their classes/units.

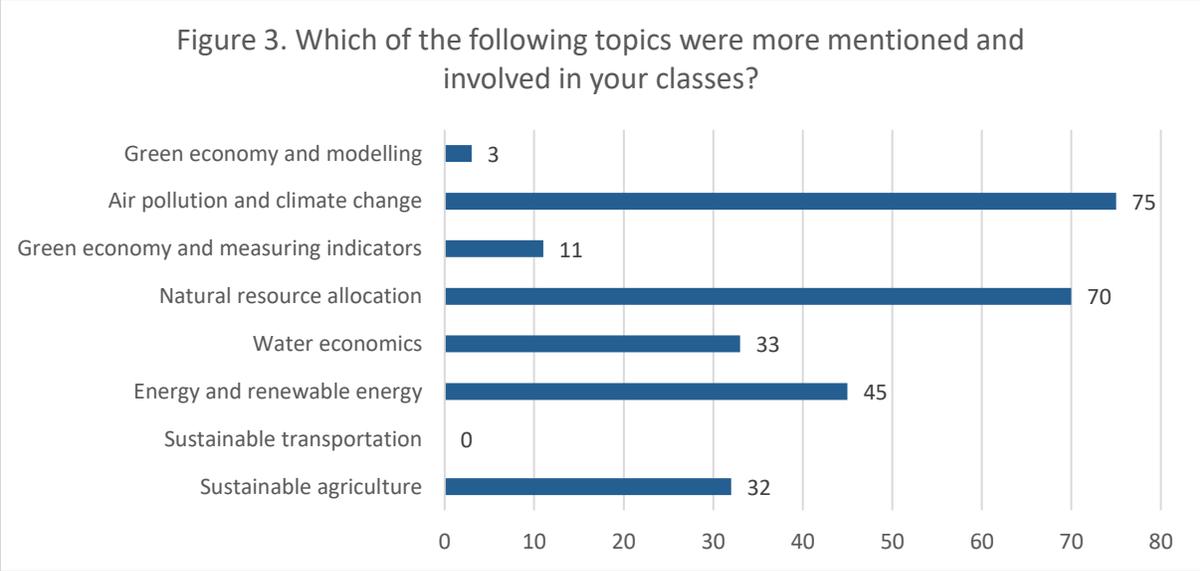
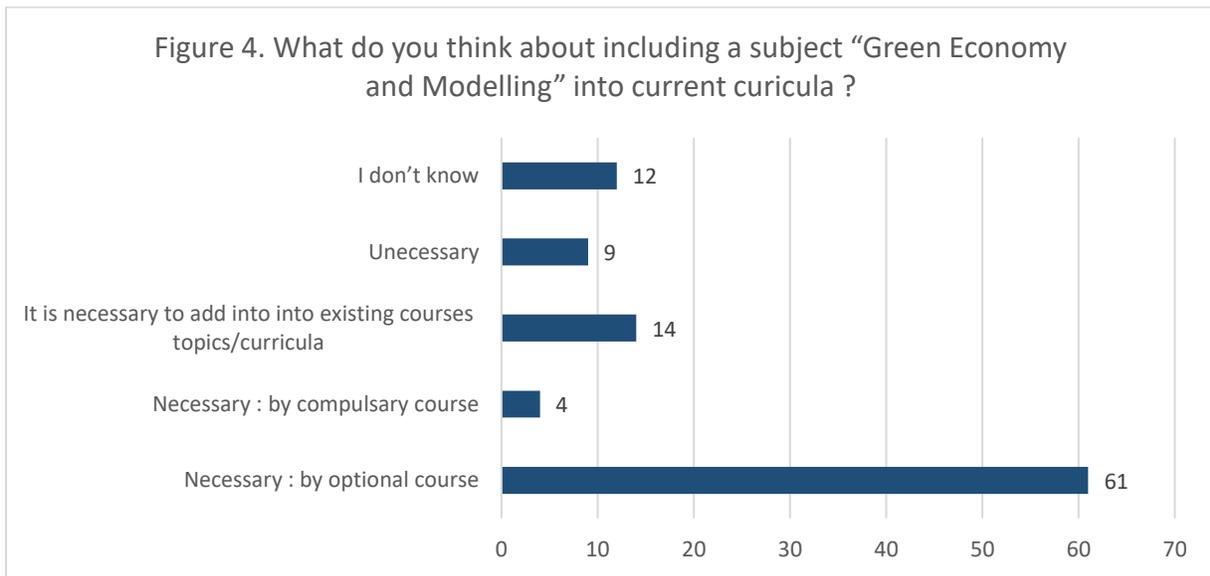
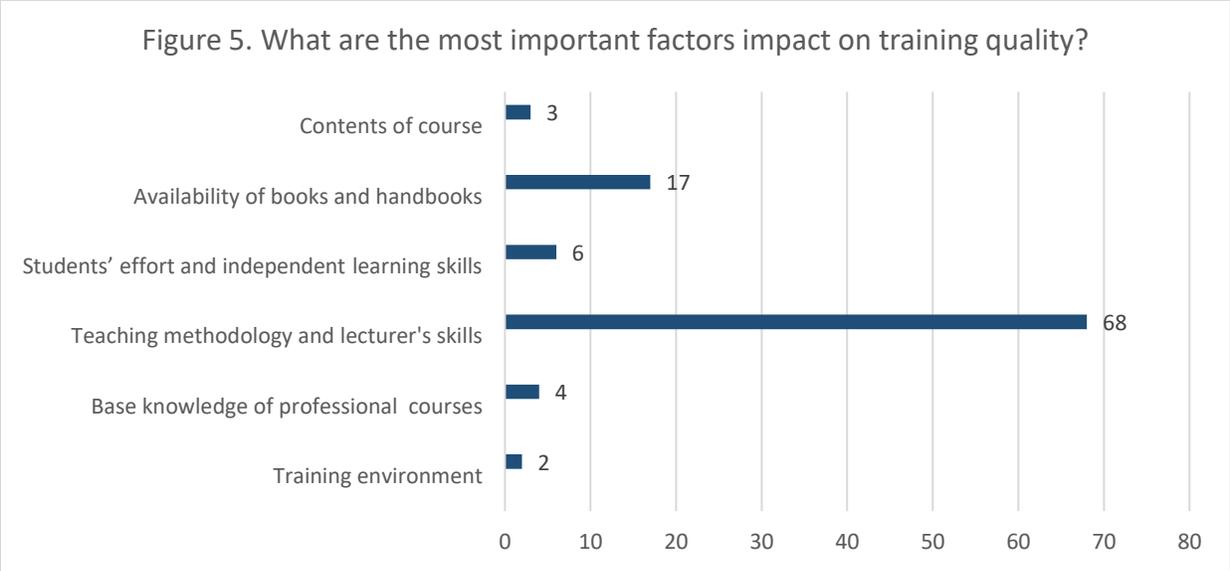


Figure 3, we can see that three quarters of the students indicate that air pollution and

climate changes were most discussed topic, followed by natural resource allocation. However, 11% of them considered that green economy and its measuring indicators were most discussed topic while only 3% chose a topic of green economy and modelling as the topics. No students (0%) had an exposure to sustainable transportation topic. Similar distribution is found from interview results with lecturers. Thus, green economy and modelling and sustainable transportation topics should be included and reflected into the contents of curricula.



Answers to the question “What do you think about including a subject “Green Economy and Modeling” into training program?” are shown in Figure 4. From the Figure, you can see that 65% of total students are interested in learning this subject.



From Figure 5, you can see that the most important factor that may influence on the students' training quality is teacher's teaching methodology and skills. Then, 17% of the students in the questionnaire list the adequacy and availability of books and handbooks as the second most important factor. Thus, it is necessary to improve teaching methodology and skills of teachers and to develop necessary books and handbooks before including these subjects into the curricula and training programs.

Secondly, I would like to introduce results of the questionnaire among students by the specialty of finance.

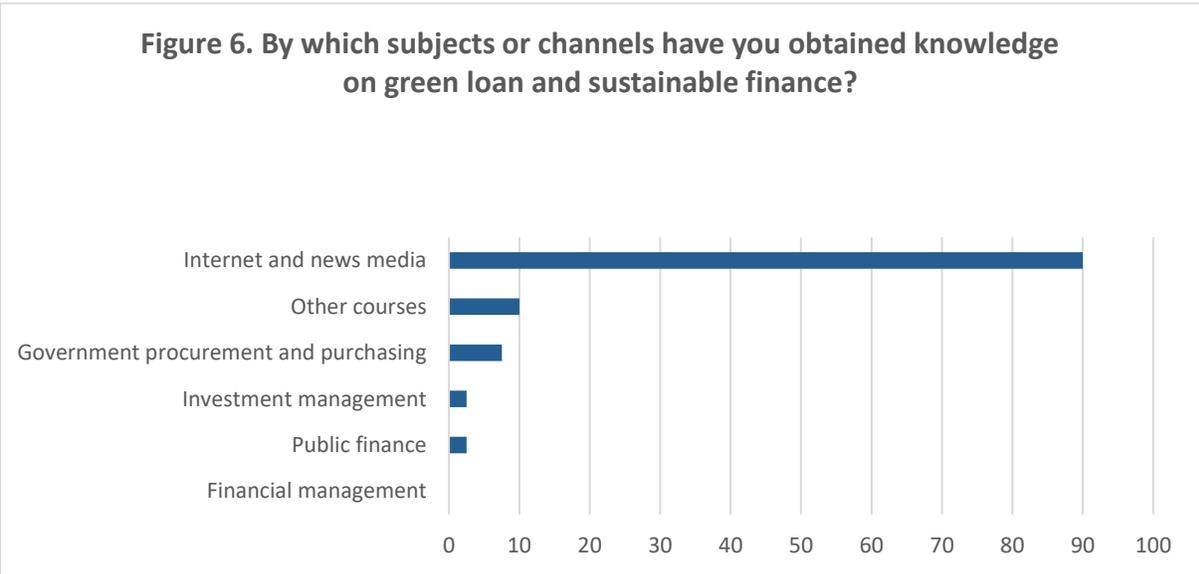


Figure 6 shows the results of the first question “How/ through which subjects or channels have you obtained knowledge on green loan and sustainable finance?”

From the bar chart, it can be seen that 90% of the students surveyed answered they gained knowledge from internet and information channels while 10% - from financial classes, 8% - from government procurement and purchasing classes, and the rest 3% - from Public finance and Investment management classes, respectively.

However, a question “How do you estimate the obtained knowledge?” was answered as follows:

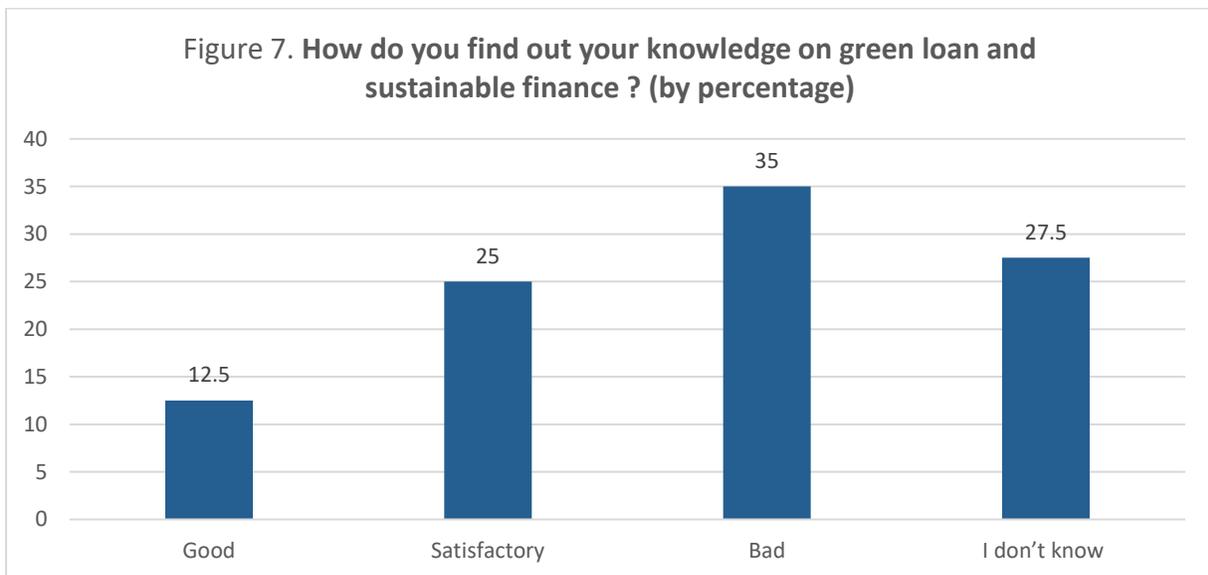


Figure 7 compares the percentage of self-assessment of the students for their knowledge on green loan and sustainable finance. Just 27.5% of the students answered “I don’t know”, 25% chose an answer “Sufficient”, 12.5% gave “Good”, and 25% provided “Bad” assessments, respectively. The cumulative percentage of “I don’t know” and “Bad” answers makes up 62.5%. This result might show that financial lecturers do not teach the terms of green loan and sustainable finance in during their classes sufficiently.

Figure 8 shows the percentage of students defining which topics were discussed in their classes/units.

Figure 8. Which of the following topics were more mentioned and involved into your classes?

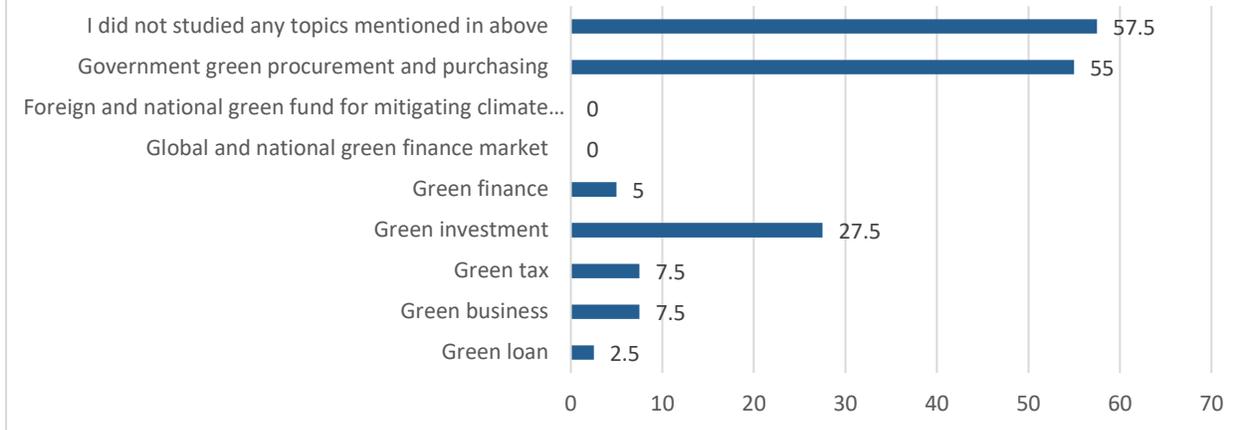
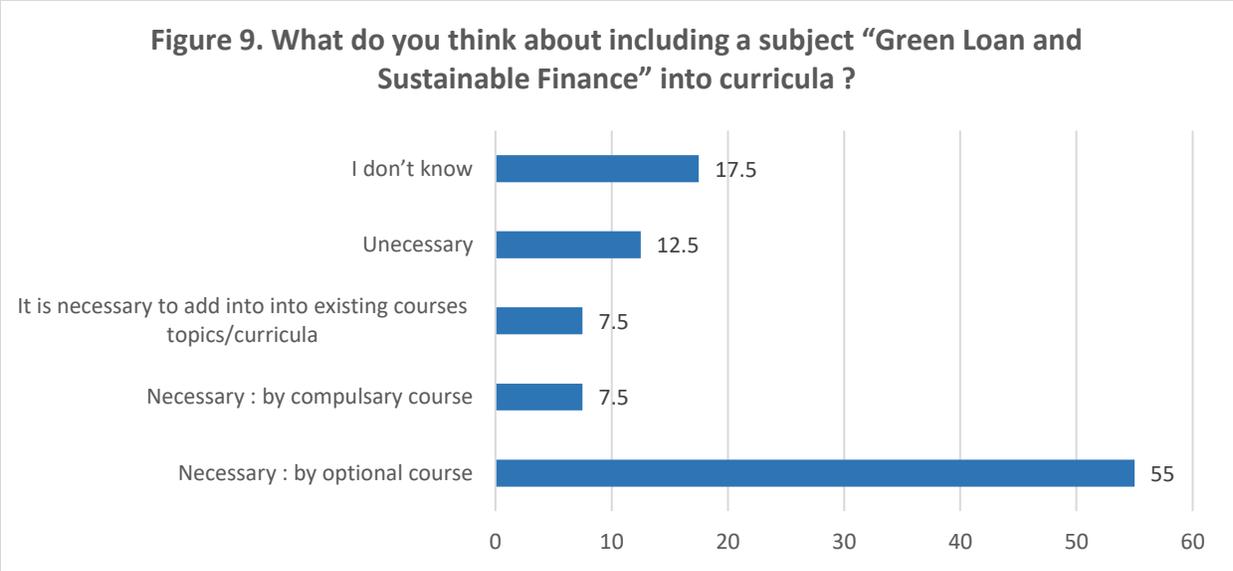
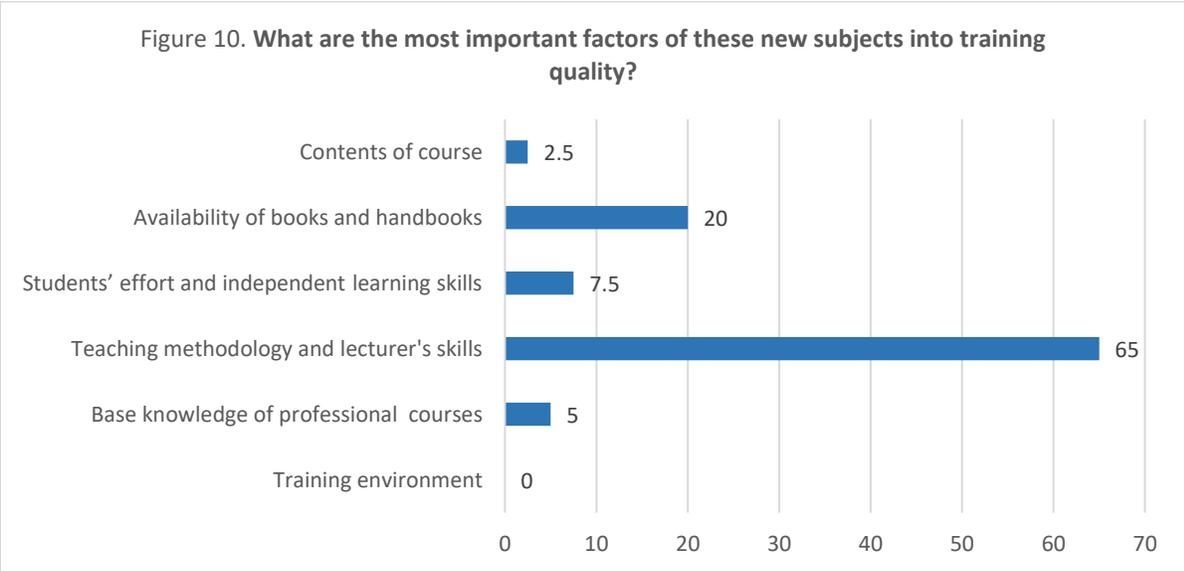


Figure 8, we can see that 57.5% of the students indicate that “I did not studied any topics mentioned in above” Government green procurement and purchasing were most discussed topic, followed by green investment . However, 7.5% of them considered that green tax and green business were most discussed topic while only 5% chose a topic of green finance as the topics. No students (0%) had an exposure to “foreign and national green fund for mitigating climate change and degradation of environmental quality” and Global and national green market finance topics.

Thus, green loan and green finance market topics should be included and reflected into the contents of curricula.



Answers to the question “What do you think about including a subject “Green loan and sustainable finance” into training program?” are shown in Figure 9. From the Figure, you can see that 70% of total students are interested in learning this subject.



From Figure 10, you can see that the most important factor that may influence on the students’ training quality is teacher’s teaching methodology and skills. Then, 20% of the students in the questionnaire list the adequacy and availability of books and handbooks as the second most important factor. Thus, it is necessary to improve teaching methodology

and skills of teachers and to develop necessary books and handbooks before including these subjects into the curricula and training programs.

Action plans and activities in the future

Availability and adequacy of handbooks that meet contents of curricula and teaching methodology: It is necessary to make a list of books and handbooks reflected into the curricula and lesson descriptions in order to supply into micro library of the department, students' independent work center, and libraries of branch schools. Some of these books and handbooks could also be in software so that it could be more useful to students than the printed forms. Project initiators should also solve the issue to subscribe the latest versions of these handbooks in English.

Opportunities and possibilities: even the demands on professional handbooks are high with fewer adequacy and supply of these books; there are sufficient human resources to translate these professional handbooks into Mongolian or to compose at national level handbooks.

Obstacles and issues to resolve: There are many necessary handbooks and books at national level; however, the market to compose and sell these books and handbooks at domestic market. In this accordance, scientists and specialists shall not write many books or their authored books will be on a very lower level of sale at the market; thus, it is necessary to organize the handbooks composition, authoring, and sales activities in new ways. If we support these activities, it will be fully possible to have handbooks necessary and adequate to students.

Secondly, it is necessary to create conditions and learning environment to use freely necessary software and statistics data of training in the school computer labs.

Thirdly, it is necessary to provide with the possibilities to get connected into the worldwide research and analysis magazine database in order to receive different information related to the subject and classes.

These additional materials, handbooks, and software obtained from different sources may help to improve training quality level, and students' learning opportunities in the modern era of open globalization if we could solve the financial and copyright issues.

Fourthly, To have information database on the Mongolian green academy

Lecturers and professors should create information database on national level creatures and research works in their relevant professional fields and to collect files and soft versions of their research work reports and scientific work results and creatures to register into the information database for further usage of students.

In addition, inter-universities annual teaching methodology workshops should be organized in order to provide lecturers and professors with the opportunities to improve their teaching methodology and to exchange with their experiences.

Moreover, it is necessary to involve lecturers and professors into short-term professional trainings permanently. In addition to the enhancement of their professional and teaching methodology, we should also grant them with the chances and opportunities to report with their creatures and works at the international conferences and workshops and to exchange with experiences.

We should also have a new mechanism, where lecturers should also be stimulated for their foreign and domestic professional qualification, reports and participation at research conferences, publications of their creatures at international level.

In order to encourage students with the research work activities, it is necessary to establish clubs of research conferences and meetings in order to grant students with the motivations to conduct independent research works and to run independent activities of these clubs by the initiatives of the students.

Discussion and conclusion

The curriculum analysis and interview findings revealed that currently, the curriculum does not provide exact guidelines for lecturers on how to educate students in such a manner that they will be able to participate in a green economy.

This phenomenon of diverse taught curricula has been further complicated by the lack of exact instructions on what content must be taught as found in the current study. The findings revealed that lecturers therefore rely on textbooks to prescribe which content they will teach and in what manner. Thus, the supported curriculum or syllabus resources become the main source of content instruction.

Curriculum designers completely integrate green economy content into the curriculums and syllabuses, including not only content for discussion purposes but also investigations and activities which will lead to skills development, compelling students to modify their behaviour and seek solutions to the urgent problems faced by humanity in terms of environmental degradation and economic collapse.

The economics and business school curriculum has the foundations in place, to fully integrate green economy content to the extent that it will provide students with actionable knowledge and skills required for monitoring, implementing, assessing, modelling and evaluating for green economic activities.

The lecturers however, will also need to be educated on green economy concepts and its implementation in Mongolia

To conclude, the findings have revealed that green economy content is incompletely reflected into the selected universities curriculum and syllabuses as most areas are addressed as extra content

The mapping of university curricula and interview related to the Mongolia's move toward a green economy presented a few interesting points for discussion. Key points are as follows:

- In order for the skills to be relevant, there is a need for the Universities to align their programmes and courses with the skills needs of the stakeholders such as

commercial banks and government agencies. This requires constant dialogue between universities and stakeholders, and possibly the co-design of curricula for green economic growth and green finance.

- Most of lecturers are not satisfied with sufficiency of textbooks and instructional materials in mongolian language and stress the need to pay more attention on sufficiency and availability of textbooks.
- To train on teaching methodology and pedagogy for young lecturers and support the faculty members to attend long and short term trainings with foreign tertiary education organizations and international organizations
- To introduce and design new modules for green economic courses rather than introducing green economic concept into the existing courses
- To introduce and design new modules for green loan and sustainable finance courses rather than introducing into the existing courses.