ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 06, pp. 4671-4678, June, 2019

DOI: https://doi.org/10.24941/ijcr.35116.06.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

AN ASSESSMENT OF ESD MAINSTREAMING INTO STANDARDS AND CURRICULA OF BASIC AND COMPLETE SECONDARY EDUCATION OF MONGOLIA

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ARTICLE INFO

Article History:
Received 16th March, 2019
Received in revised form
26th April, 2019
Accepted 13th May, 2019
Published online 30th June, 2019

Key Words:

Education for Sustainable Development mainstreaming, primary and secondary education standard, curriculum assessment, policy documents.

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ABSTRACT

The paper intends to present a case study report on how the ideas of Education for Sustainable Development were mainstreamed and integrated into national standards and curricula of basic and complete secondary education in Mongolia. First, we tried to give a proper definition of the terms such as 'Sustainable Development', 'Education for Sustainable Development' from Mongolian nomadic perspectives. The term 'Sustainable Development' in Mongolian context is, on the one hand, the integration of nature and quality of a matter (content and form), and on the other hand, it is the integration of '*arga'* and '*bilig*' (intelligence and practice). To live in one world, it is absolutely essential to stabilize the socio-ecological inequality for dealing with the urgent ecological crisis (Jadamba and Tungalag, 2015). Secondly, based on the Mongolian context, the studydefined the most important elements covering the three pillars of sustainable development that were to be used as the main indicators for the assessment of ESD mainstreaming into standards and curricula of basic and complete secondary education in Mongolia. With the help of clearly defined elements, we revisedthe education policy documents, the existing standards and curricula for basic and secondary education in Mongolia; carried out an assessment of ESD mainstreaming into standards, and curricula of basic and complete secondary education of Mongolia; prepared recommendations on how to improve the mainstreaming of ESD in standards and curricula.

Citation: Tungalag Baljir, Jadamba Badrakh, Bolortuya Baljir and Ganzorig Banzragch. **2019.** "An assessment of ESD mainstreaming into standards and curricula of basic and complete secondary education of Mongolia", *International Journal of Current Research*, 11, (06), 4671-4678.

INTRODUCTION

Due to the research on the ecological, socio-cultural and economic crises, the UN Conference on the Preservation and Enhancement of the Human Environment in 1972 introduced the idea of ESD to transform the development. The urgent need of implementation of the idea of sustainable development and building an awareness on education for sustainable development, UN, World Unions as well as all the countries have paid much attention to reorient all types of education for Sustainable Development through their national policies and actions. The Government of Mongolia has started to support the promotion and integration of the different ESD innovations within the context of basic and complete secondary education in Mongolia since 2007. As the largest teacher education center for all educational and science sectors of the country, Mongolian National University of Education has provided the multi-dimensional and community-based researches which encourage every single individuals as well as society to make actions happen and interact with the different stakeholders including government officials to make changes.

The researches mainly aimed at re-orienting basic and complete secondary education to address sustainability for the improvement of the quality of teaching and learning as well as to provide teachers new opportunities to incorporate ESD into education reform efforts. The current research has been done to assess and monitor the ESD mainstreaming into standards, curricula, and textbooks of basic and complete secondary education of Mongolia that has been supported by Ministry of Education, Culture, and Science of Mongolia (MECS).Since 2013, MECS has revised the current national existing standards, curricula and textbooks for primary and secondary education twice. As it is in line with project objectives of ESD promotion, there is need of assessment of the ESD mainstreaming quality and its implementation in real life.This assessment not only includes assessment of primary and secondary education standard and curriculum, but also recommendation for improvement. Assessment results will be used as baseline data for further ESD projects.

Defining ESD from Mongolian perspectives: In accordance with the basic principle of the Mongolian world view, all the

things and phenomena in the world are solely interconnected while forming one world or vital unit and interacting one another (Jadamba, 2012). On the other hand, universe is the one world where things and their forms and movement are interconnected as a unit within "space and time". As soon as things are interconnected they exist containing much energy and "Light" ("information") which transmits the interconnection and integration (unity). Based on this basic principle, the sense of recognizing all the things and interconnectedness of ideas about those things is called the Mongolian World View (Tungalag *et al.,* 2015).

Mongolian world view: With respect of Jadamba and Tungalag's point of view of one world approach (2010), 'world' is one object (so it is called one world). First one object, only one object exists. That object is the integration of two opposites or a pair of objects and its essence. The unmovable, image, nature, content, place-time, space-time ("emptiness and place") of the opposite pairs are called *"bilig",* while the movable, character, feature, form, quantity-quality, mass-energy of those objects are *"arga"*. When one object is integrated with the two opposites, it creates another object which has the triangle structure. Lots of objects in the world consist of these three (or seven out of six). One consists of the two opposites, and reversely, the two opposites consist of another two opposites and in this way, the world consists of many other countless pairs of opposites. On this regard, world is the integration of *"arga"* (character, feature (quality), form and place) which is reality, and *'bilig"* (image, essence, content, space-time) which means "emptiness" and their "*ur*– result/effect" or one life. Existence in this world is individual world which is the energy character of one world. On the other hand, the image of existence or nature is one world. The features of existence (those are one world and individual world), their forms and movement are the phenomena occurring in one world. To make it more precise, the image and nature of existence and individual world or "emptiness" is identical in those on the one world. However, the manifestation (unity of all things) and its forms and movement (changes and reforms) are different from one another.

Objective: The ESD core team of Mongolian National University of Education was charged with the dual task of (1) carrying out an assessment of ESD mainstreaming; and (2) preparing recommendations on how to improve the mainstreaming of ESD in standards and curricula. The findings from this study serve as baseline for (1) engaging all the stakeholders in reorienting education programs to address sustainability; (2) improving the skills of educators on designing and developing ESD curriculum and courses; and (3) unfolding new approaches on how to incorporate ESD related objectives into teaching and learning of subject matters.

MATERIALS AND METHODS

The study was carried out in 2017 – 2018. The team was divided in 8 sub-teams: seven teams represented subject team, grouped in seven subject clusters, and one team focused on the general education standards (see Table 1).

Methodological Approach: Multi-Level Analysis: In line with international comparative studies conducted by the International Association for the Evaluation of Educational Achievement (TIMSS, PIRLS, Civic Education Study, etc.), a *multi-level analysis* was carried out.

That is, a distinction was made between intended curriculum and implemented curriculum. These terms tend to be misleading in Mongolia due to the narrow definition of the term "curriculum" in Mongolian. Therefore, the research team analyzed the intended curriculum which represents the ways in which students are expected to engage with ESD as defined in national-level standards, curriculum documents. This study did not evaluate learning outcomes of students in terms of ESD and therefore only focused on a document analysis (analysis of official standards, curricula).

Data Collection Instruments: The following instruments were developed to obtain standardized baseline data on the mainstreaming of ESD:

Intended Curriculum (document analysis)

- Socio-cultural elements/topics: 22 items
- Environmental elements/topics: 16 items
- Economy elements/topics: 12 items
- ESD-related attitudes and values: 6 items
- ESD-related behaviors: 10 items
- ESD-related skills: 22 items

The instruments for the analysis of standards and curricula comprise both items from international ESD standards and curricular frameworks as well as national items. Most of the international items in these research instruments are built upon the following well-known studies and frameworks of ESD:

- UNESCO's Education for Sustainable Development Toolkit (McKeown, Hopkins, Rizi, and Chrystalbridge, 2002)
- Comparative study of ESD curriculum in nine European countries, conducted by the Network of Education Policy Centers (Domazet, Dumitru, Jurko, and Peterson, 2012)
- Recent academic studies on the content of social studies textbooks from 69 countries for the time period 1970-2008 (Meyer, Bromley, and Ramirez, 2010:1119134;Bromley, Meyer, and Ramirez 2011:517-545)
- International Civic Education Study, conducted by the International Association for the Evaluation of Educational Achievement (IEA; Torney-Purta, Lehmann, Oswald, and Schulz 2011)
- World Values Survey (WVS 2014)

The reliance on previous studies and surveys provides continuity with established measures commonly used in this area of research. Importantly, all elements or topics were adapted and appropriated to the Mongolian context. The list of international elements or topics was supplemented with Mongolian concepts that are related to the socio-cultural, economic, and environmental dimensions of ESD.

The initial list of Mongolian elements or topics included the following:

- Socio-cultural dimension: conflict between nomadic and sedentary culture, party politics and parochialism, political deals and negotiations, cultural values and heritage, violence, cultural reform, cultural criticism, quality and access to service, system of religion and

Table 1. Clusters and subjects

Cluster	
Humanities	Preschool/preparatory Civic education Mongolian language Literature History
Mathematics and Informatics	Mathematics Informatics
Arts and esthetics	Physical education Music Health Drawings Fine art Technology
Foreign language	English Russian
Social science	People and Society People and Environment Legal education Social studies
Natural science	People and Nature Chemistry Physics Biology Geography

Table 2. Multi-Level Analysis of ESD Mainstreaming

	Quantitative Data	Qualitative Data
Educational Standards	33 standards evaluations and ratings	25 expert reviews: 1 on general education standards, 24 on subject standards
National Curriculum	146 curriculum evaluations and ratings	Curriculum analysis of 3 select subjects: Mongolian language, biology, English

Table 3. Educational standards, by subject cluster

Cluster	Total number of documents
Humanities	4
Mathematics and Informatics	2
Arts and esthetics	9
Foreign language	1
Social science	4
Natural science	10
Multiple subjects	3
Total	33

Table 4. Curriculum documents, by subject cluster and grade level

Cluster	Grade level			Total number of documents
	Primary	Basic	Secondary	
Humanities	11	15	10	36
Mathematics and Informatics	5	7	6	18
Arts and esthetics	17	16	12	45
Foreign language	1	7	3	11
Social science	0	1	3	4
Natural science	5	13	14	32
Total	39	59	48	146

Table 5. Provision of definitions of key concepts, by document type

Definition of concepts is provided	Educational standards	Curriculum documents
	n=33	n=146
“eco-system”	48%	20%
“sustainable development”	36%	22%

- beliefs, social freedom, ethics and national standards, rights of future generations, social depression, information and media dictatorship
- Environmental dimension: rehabilitation, indigenous knowledge of nature, man, flora, and fauna, rural development
- Economic dimension: limited resources of Mother Earth, production and consumption, sustainability and development, excessive consumption

Based on a pilot-test, the Mongolian elements or topics were revised. Topics that were considered repetitive, ambiguous, or irrelevant during the pilot-test were eliminated from the study.

Overview of Quantitative and Qualitative Data: Table 2 provides an overview of the data collection instruments that were used to obtain quantitative and qualitative data on ESD mainstreaming in standards, curricula on paper (in documents).

Analysis of Educational Documents: Over the course of the past ten years, a major school reform took place in Mongolia, first extending schooling from ten years to eleven years, and then from eleven to twelve years. Unsurprisingly, all standards and curricula were revised over the period 2004 – 2018. As a result, the research team was in a position to examine numerous educational documents that were all developed over the past decade. The following tables provide a summary of the documents analyzed for the two types of documents, that is, for standards and curricula.

Findings

This section of the report is grouped into five parts:

- Qualitative policy analysis of relevant education policy documents (point 5.1)
- Qualitative curriculum and content analysis (point 5.2)
- Findings of the quantitative assessment (point 5.3)
- Recommendations of experts on ESD mainstreaming (point 5.4)

Given the relevance of this study for establishing baseline indicators on ESD mainstreaming, the greatest part of the findings deals with the quantitative assessment.

Policy Analysis: The research team identified 37 major policy documents produced over the period 1997-2014. The policy documents included:

- 6 laws passed by Government (5 education laws, 1 science law)
- 5 programs approved by MES (e.g., Improve the Quality of Teacher Professional Development, etc.)
- 26 National Action Plans(represent 4-year plans and are launched at the beginning of a new administration) including National Programs of the Government (multi-year programs, last 3-10 years and endure changes in government)

In a second step, the research team examined whether ESD was addressed, how extensively it was addressed, and how it was defined. The content analysis of policy documents yielded the following first finding.

5.1 From the entire 37 major policy document that MES and the Government of Mongolia issues over the period 1997 – 2014, 7 policy documents (19 percent) were directly related to sustainable development and 19 additional ones addressed somewhat ESD related issues. Furthermore, there were two ESD related National Programs launched but neither enforced nor implemented: "Ecological Education for All" (1997) and "Education for Sustainable Development for All" (2009 – 2019).

The seven documents that are directly related to ESD are the following:

- National Program "Ecological Education for All" (established in 1997)
- National Program "Education for Sustainable Development for All" (2009-2019)
- National Program "Ensuring Gender Equality" (2002 – 2015)
- National Program "Violence Prevention" (established in 2009)
- Government Policy towards Ecology (1997)
- Regulation on Disaster and Risk Assessment (2006)
- Non-Formal Education Curriculum on Life Skills (2010)

In the remaining 30 policy documents, ESD or ESD related issues were either not mentioned at all (11 documents) or only marginally addressed. Clearly, the two key ESD policy documents are the two national programs "Ecological Education for All" (1997) and "Education for Sustainable Development for All" (2009 – 2019). Both national programs attempted to combine international conceptualizations of ESD with Mongolian cultural values.

The National Program 1997 "Ecological Education for All" (1997) defined ESD as:

- Living in harmony with the nature
- Improving the natural environment
- Learning to live healthy
- Learning to use natural resources responsibly
- Respecting and valuing the natural beauties

The National Program "ESD for All" (2009 – 2019) deals both with formal and non-formal education. Objective 3 of "ESD for All" describes formal education and identifies the following goals (see ESD for All, page 3):

"Objective3

Reflect and implement the content of education for sustainable development in all formal and non- formal levels of learning curriculums;

Activities to be implemented

- Develop and implement curriculum standard, content, form, methodology for sustainable development, environment and ecology education for formal and non-formal education;
- Organize preparation work and implement in stages the training of teacher training and retraining formally and

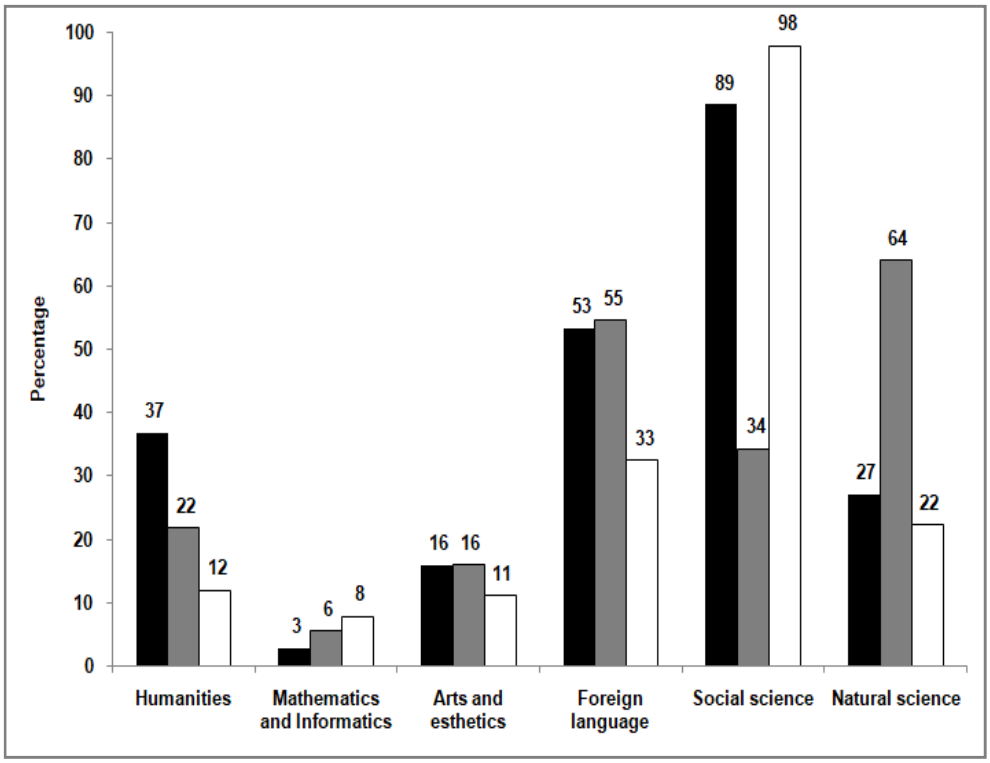

Figure 4. Coverage of ESD content in curriculum documents, by cluster

Table 6. ESD-related behaviors in intended curriculum (percent of documents mentioning each behavior)

Behavior	Educational standards	National curriculum
Helping friends in need	69	48
Helping the poor	28	11
Promoting human rights	72	37
Protecting the local environment	78	58
Protecting the Earth	75	45
Collecting money for a social cause	16	6
Collecting signatures on a petition	69	49
Recycle materials	58	27
Reuse materials	61	38
Reduce consumption	66	36

Table 7. ESD-related skills and competencies in intended curriculum (percent of documents mentioning each skill)

Skill / competency	Educational standards	National curriculum
1.Identifying and clarify values	72	52
2.Ability to separate facts from opinion	78	67
3.Applying systemic thinking	97	82
4.Classifying	94	80
5.Comparing	97	90
6.Critical reading	88	83
7.Critical thinking	97	90
8.Critical writing	81	81
9.Data collection and data analysis	91	82
10.Decision-making	91	71
11.Futures thinking	69	47
12.Identifying stakeholders and their interests	59	40
13.Inferring-based on observation	91	83
14.Measuring - quantitative	84	79
15.Negotiating and consensus building	69	45
16.Observing - qualitative	78	86
17.Participating in democratic decision-making	94	84
18.Self-assessment and regulation	78	76
19.Working with others	91	84
20.Understanding complexity	78	71
21.Understanding graphs and symbols	69	77
22.Understanding interrelationships across disciplines	88	77

Table 8. Priority Areas for Improving ESD Mainstreaming (Recommendation of 25 experts)

Area	Points
1.Teacher development and upgrading towards ESD	41
2.Education policy	23
3.School leadership, management awareness of and support to ESD	11
4.Public participation and involvement	10
5.Textbook improvement	9
6.Monitoring of ESD implementation by developing indicators	7
7.Media involvement and information dissemination	7
8.Teaching and learning resources	6
9.Local, regional and school curriculum development	6
10.Student led organizations to contribute attitude change	4

- Non-formally on sustainable development, nature, environment, and ecology education;
- Reflect and implement the sustainable development, nature, environment, ecology education programs in the content of curriculums of all universities, colleges regardless of the ownership type depending on the professional orientation;
- Reflect and organize in contents of training curriculums of professional training centers, secondary schools ecological education programs;
- Develop, approve, implement the curriculum, methodology, methods of ecological education for formal and non- formal trainings of citizens, family."

Qualitative Curriculum Analysis: The ratings of experts on the level of ESD mainstreaming in standards and curricula revealed great differences among the various subjects. The qualitative analyses of standards and curricula confirmed the general assessment of the experts:

ESD is relatively well integrated in biology and English language, but under-developed in other subject matters. In addition, the mainstreaming of ESD focuses mainly on the teaching of knowledge/content and neglects in great part the transmission of ESD relevant skills, and applications.

Major Findings from the Quantitative Assessment

Relation between standards, curricula, textbooks: (i) In general, there is little match between standards, curriculum and textbooks, (ii) key concepts of ESD are relatively better explained in standards but they are – possibly because of a lack of capacity – not translated into concrete curricula and textbooks, (iii) textbooks and curricula are more progressive with regard to ESD than standards simply because of the timing (standards were developed before ESD Decade).

•Most of the educational standards (30 out of 33) were published in 2004, whereas most of the curriculum documents and textbooks were published after 2007 (with half of the documents and textbooks published after 2011; supported by ADB).

•In other words, the educational standards were developed before the launch of the UN Decade of ESD, whereas curriculum documents were revised and developed during the Decade. As a result, there is more on the conceptual framework of ESD in curricula than in the standards.

Natural sciences (biology) and foreign languages (English) define ESD better than other subject areas.

•Definitions of key-concepts are important when introducing a new curricular innovation such as ESD. Nevertheless, the analysis suggests that definitions are missing in most materials. The following Table 6 shows the extent to which key concepts of ESD, in particular the concepts of "eco-system" and "sustainable development," are explained.

- Curriculum documents for natural science subjects are more likely than other documents to include these definitions. More than half of the natural science curriculum documents include a definition for the concept "eco-system" or "sustainable development" (59 and 53 percent). This pattern is statistically significant ($p<0.01$).[1]

From the three pillars of ESD (environment, social-cultural, economic), the economic dimension is most neglected except in the social science curricula.

- In educational standards: about half of the environmental topics (54 percent) and the socio-cultural topics (47 percent) are mentioned, whereas only one-third of the economic topics (34 percent) are mentioned.
- In curriculum documents: less than one third of the environmental topics (30 percent) and the socio-cultural topics (27 percent) are mentioned, whereas one-sixth of the economic topics (17 percent) are mentioned.

- Moreover, the coverage of the three ESD content elements varies across subject clusters. This pattern is illustrated in Figure4that refers to curriculum documents
- Socio-cultural topics are well covered in the social science curriculum (with 89 percent of topics mentioned).
- Environmental topics are integrated in the natural science curriculum and in foreign language curriculum (with 64 percent and 55 percent of topics mentioned).
- Economics topics are well integrated in the social science curriculum (with 98 percent of the topics mentioned).

There is more emphasis on skills and competencies than values and knowledge in ESD in all three types of documents (standards, curricula, textbooks)

[1]A statistically significant difference is likely to indicate that the differences are not due to chance alone.

- Most ESD-related skills and competencies are covered in standards and curriculum (see Table 7). For example, 17 out of 22 skills are mentioned in more than three-quarters of the educational standards and 15 out of 22 skills are mentioned in more than three-quarters of the curriculum documents.
- Closer look on these patterns, however, suggests that core ESD skills – future thinking, identifying stakeholders and their interests, and negotiating and consensus building – are the least emphasized in the intended curriculum. For example, the skill of "future thinking", which stands in the center of the definition of sustainable development (commitment to equity with future generations), is mentioned in 69 percent of the standards and 47 percent of the curriculum documents. These figures are relatively low.

Recommendations of Experts in Mongolia on ESD Mainstreaming

The assessment of 25 experts reflects their own professional preoccupations and priorities, that is, the need for more teacher education and policy work in ESD.

Upon completion of the data collection, the expert teams were asked to make recommendations on how to improve the mainstreaming of ESD in standards and curricula. To facilitate this process, we used Open Space methodology, which is designed to elicit open, creative, and thoughtful collaboration in a constructive atmosphere. After a short overview of research project and introduction to Open Space methodology, expert teams set the agenda, proposing specific recommendations for further mainstreaming of ESD in the curriculum. Following small group discussion and elimination of duplicate proposals, expert teams ranked priority areas for ESD reform. As illustrated in Table 11, teacher education was seen as the highest priority, followed by the need to develop a suitable legal framework (educational policy) for the teaching of ESD. The priorities reflect to a great extent the composition of the expert or research team: 52 of them were faculty members of MNUE.

Conclusion

Based on a thorough analysis of policies, educational documents (standards, curriculum), the study finds that ESD is not sufficiently integrated in the official education program of schools (standards, curriculum). The following findings were presented in the previous section and supported with data. They are grouped by the methods and instruments used for the assessment of ESD mainstreaming.

Policy Analysis

From the 37 major policy documents that MES and the Government of Mongolia issued over the period 1997 – 2014, 7 policy documents (19 percent) were directly related to sustainable development and 19 additional ones addressed somewhat ESD related issues. Furthermore, two ESD related National Programs were launched but neither enforced nor implemented: "Ecological Education for All" (1997) and "Education for Sustainable Development for All" (2009 – 2019).

Curriculum Analysis: ESD is relatively well integrated in biology and English language, but under-developed in other subject matters. Appendices 7 and 8 (volume 2) provide a glimpse into mainstreaming ESD in curricula in three selected subjects. Extreme case sampling was used to select the three subjects: biology and English language are examples of subjects where ESD mainstreaming was, based on the rating by experts, considered high. In contrast, Mongolian language curricula analysis was carried out because it reflected a low level of mainstreaming. In addition, the mainstreaming of ESD focuses mainly on the teaching of knowledge/content and neglects in great part the transmission of ESD relevant skills, and applications.

Major Findings of Quantitative Assessments: Relation between standards and curricula: (i) In general, there is little match between standards and curriculum, (ii) key concepts of ESD are relatively better explained in standards but they are – possibly because of a lack of capacity – not translated into concrete curricula, (iii) curricula are more progressive with regard to ESD than standards simply because of the timing (standards were developed before ESD Decade). Natural sciences (biology) and foreign languages (English) define ESD better than other subject areas.

- From the three pillars of ESD (environment, social-cultural, economic), the economic dimension is most neglected except in the social science curricula.
- Student and community participation focus very much on values that are taught anyways in schools of Mongolia (helping friends in need, protecting the local environment) because they reflect Mongolian cultural values.
- There is more emphasis on skills and competencies than values and knowledge in ESD in all two types of documents (standards, curricula).

Recommendations

Based on the empirical study on ESD in Mongolia, presented in the previous sections of this report, the team of experts at the Mongolian National University of Mongolia (MNUE) proposes the following recommendations:

- ***Policy:*** The Ministry of Education and Science (MES) and the Ministry of Environment and Green Development (MEGD) need to join forces to collaboratively update the National Program "Education for Sustainable Development for All," submit it to the Government of Mongolia for approval, and use the policy document as a foundation for developing and implementing an ESD reform over the period 2015 – 2020.
- ***Action programs:*** The two ministries should establish an Inter-Ministerial Coordination Group "ESD for All" (2015-2020) with a mandate to better align and complement the two ministries' policies and action programs.
- ***ESD mainstreaming in standards and curricula:*** The standards related to ESD are outdated and need to be updated to reflect the new curricula. ESD *mainstreaming* in standards and curricula needs to be improved by using "best practices" from eco-schools, green schools and other innovative schools as well by drawing on experiences from other educational systems.

- ***Knowledge, skills, application:*** Currently, the focus is on ESD knowledge. The scope of ESD needs to be expanded to also include a focus on skills and applications. Pre-service and in-service training should focus on preparing teacher educators and teachers on how to use ESD concepts to strengthen specific competencies (e.g., learning through action, inquiry-based learning, distinguishing between facts and opinions) and applications (e.g., ecological awareness, civic engagement, advocacy for sustainable development, engagement for social justice, sensitivity for inequity and poverty).
- ***ESD as a concept:*** Currently, ESD in schools is not taught as a concept that links environmental, socio-cultural, and economic aspects of development. There is a need to teach ESD holistically as a concept with consequences for thinking, acting and living responsibly.
- ***Adaptation of ESD into Mongolian cultural beliefs:*** Concepts on the eco-system and sustainable development resonate with traditional Mongolian beliefs on man and nature. The link between international ESD concepts and cultural beliefs in Mongolia needs to be elaborated and conceptualized in order to teach ESD more effectively to students in Mongolia.
- ***Global ESD movement and global ESD literacy:*** There is no awareness in schools of Mongolia about the broader debates and international agreements on sustainable development. There is a need to share the broader context on sustainable development and instill a sense of a global responsibility for sustainable development in all countries including in Mongolia.

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