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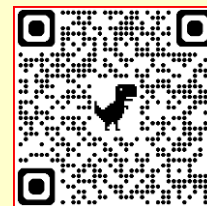
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The Situation of Primary Education Teacher Curriculum

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ABSTRACT

The purpose of the study is to make a comparative analysis of the ICT curriculum of Mongolian and International universities that train primary education teachers. The study is a document study, cluster and probability analysis methods (expertise) were used to perform the study, and a Microsoft Excel file-tool was prepared using VBA code to integrate and process the research results. Three Mongolian universities and 8 foreign universities participated in the research. A total of 14 curriculum documents were studied and an excel file with 3+11=14 columns and 46 rows of criteria for research results was created for quantitative and qualitative analysis. A total of 687 research units (cells in the excel file) were evaluated from the database and classified. The research was limited to the content of ICT in primary education teaching curriculum. Referring to the results of the research, our national universities have included more computer software issues in their teacher training curriculum, while foreign schools have incorporated continuous teacher development, evaluation, and planning skills into their ICT teacher curriculum. The importance of this content analysis is to identify the desired competencies that will be reflected in the reform of ICT curriculum in primary education for future teachers.

KEY WORDS: teacher, education, digital, curriculum, development

I. INTRODUCTION

Due to the pandemic of Covid-19, there is a need to introduce and digitize the latest ICT technologies all over the world. In all this, the Government of Mongolia is working diligently to make a digital transition. There is a need to understand and overcome the nature and factors of challenges and difficulties, and to use new decision-making methods and tools for planning that meets the needs of society. There are different strategies how to continue digital transformation in education. The education sector is continuously evolving, and digital transformation is enhancing pedagogy, providing new learning experiences for students [1]. Researchers agree that one of the main

factors that positively affect the quality of the education sector is the supply of professionally competent teachers. One of the important concepts included in the Delor report in 1996, the idea of a holistic approach to education, which is reflected in the four pillars of learning, has had a significant impact on the discussions in many countries of the world on issues such as education policy, teacher training, and curriculum development [2].

"The participants of the World Education Conference held in Incheon, South Korea in May 2015, when setting the framework of the priorities of the general education program within the framework of

the Sustainable Development Goals, unanimously agreed that "Teachers and teaching play a particularly important role in effective learning at all levels of education". If teaching personnel policy can be aligned with all levels of education and evolving priorities, it will ensure a close relationship between the pressing needs of education and increase the chances of successful implementation [3]. In addition, the "Skillful Teacher" program included in the Government's 2020-2024 action program is unique in that it focuses on teacher training, continuous professional development of teachers, improving teachers' working conditions and salaries, skills, competencies, and teacher development. In the plan, the objectives of "to bring the teacher training university program to the same level, to officially confirm and accredit its quality and conformity, and to raise the reputation of the teacher's profession, to have a unified standard" [4]. Within the framework of these objectives and planning, there is still a need to analyze the professional curriculum that prepares teachers in our country. In this way, it is important to study the good practices of ICT curriculum for primary education teachers in comparison with other countries.

II. LITERATURE REVIEW

Digital technologies now extend into all areas of a teacher's work including teaching and learning, assessment, communicating and collaborating with colleagues and parents, and creating and sharing digital content and resources [5]. Teachers thus need to develop both general digital skills (as everyday users of digital technologies) and teaching-specific digital competences that can support them as educators and professionals in digital environments. Several international frameworks describe the different components of teachers' digital competences with the aim of assisting national governments to embed relevant digital competences into teacher education [6]. According to Article 12 of the General Education Law of our country [7], "Higher education institutions shall train teachers through accredited programs. A citizen with a profession other than a teacher can work as a teacher by participating in the teacher training program.

Furthermore, according to criteria 2.2.b of the National Council for Accreditation of Higher Education (the digital environment of the program), it is stated that the environment and technological conditions for organizing digital learning are created, and the equipment and materials are improved. Based on these, we continue to build long-term policy documents and policies to support digital-skilled human resources within the legal framework. Moreover, the government institutions in charge of education have been reforming the program, conducting regular trainings for the development of teachers' digital skills, and defining trends. However, according to the study of undergraduate teacher training curriculum in primary education, many universities in our country are not nationally accredited, and the differences between schools lead to the creation of teaching staff trained in programs that are not compatible with each other, and the professional quality, which may further affect equal opportunities.

Therefore, there is a need to compare national and foreign programs in the same direction in order to redevelop the bachelor's program that prepares primary education teachers. In addition, the module reflected in the digital skills standard issued by the ICDL foundation that sets out knowledge and skills relating to the pedagogically effective use of ICT to support and enhance teaching, learning and assessment in the classroom [8]. Moreover, the organization is working internationally to develop curriculum, assessments and criteria necessary to improve all aspects of digital skills for students to be successful in their studies. Also, in the recommendations of the

information and communication technology competence framework for teachers issued by UNESCO, 3 stages of teacher development related to teaching (technology education, knowledge deepening process, and knowledge creation process) are included [9]. Each of these 3 levels has 6 modules, which are included in the curriculum to determine the criteria for evaluating the teacher's ability and include in the program, emphasizing the importance of the role of information and communication technology in education reform.

III. RESEARCH METHOD

A. Research purpose and objectives

The purpose of the study is to make a comparative analysis of the ICT curriculum of Mongolian and international universities that train primary education teachers.

Within the scope of this study, the following objectives were placed. It includes:

- Creation of a database that integrates the content of ICT lessons within the framework of the primary teacher education program
- To analyze the objectives of the education sector reflected in the development policy and planning documents of the Mongolia
- Developing and evaluating criteria based on international educational standards
- Analyze research results

B. Research methodology

This research belongs to the type of documentary research. Cluster analysis and Probability analysis methods (Expertise) were used to perform the research, and a Microsoft Excel file-tool was prepared using VBA code for the integration and processing of research results.

C. Research object, scope and limitations

The analysis of 4 long-term and medium-term development policy and planning documents approved by the Great Khural of Mongolia for the digital development of the education sector was discussed in the introductory part of the study. When selecting the foreign universities included in the study, the countries that lead in the index of the quality of primary education were considered. The research was limited to the content of ICT in primary education teaching curriculum.

IV. RESEARCH RESULTS

Three Mongolian universities and 8 foreign universities participated in the research [10,11,12]. A total of 14 curriculum documents were studied and an Excel file with 3+11=14 columns and 46 rows of criteria for research results was created for quantitative and qualitative analysis. A total of 687 research units (cells in the Excel file) were evaluated from the database and classified into 3 types: "directly related", "indirectly related", and "irrelevant" according to their relevance to the content of ICT included in the primary education teacher's curriculum. According to these categories, 23.7 percent (163) of the total unit objects were defined as "directly related", 34.9 percent (240) were "indirectly related", and 41.3 percent (284) were defined as "irrelevant" (Table 2). The criteria for evaluating the data in the table are pre-prepared based on the International Standards for Education, adjusted to the specifics of our country. In addition, in order to verify the authenticity of the information in each Sheet, the source from which the information was obtained is attached as a link to the relevant site, and in case it is not possible, the relevant part of the printed material is attached as an "Object" [13,14,15].

TABLE I. CURRICULUM NAME AND CONTENT CAPACITY (PER DOCUMENT)

Country	Name of the University	Subject Name	Content capacity /credit, unit /
Mongolia	Khovd Universtiy	Information and communication technology	2 cr
Mongolia	Khovd Universtiy	Application of ICT in education	2 cr
Mongolia	Dornod Universtiy	Methods of preparation of digital materials	2 cr
Mongolia	Dornod Universtiy	Information Technology, Information System	2 cr
Mongolia	Mongolian St.Unv. of Education	Information and communication technology	2 cr
USA	Montclair State University	Computer Science (MS)	2 cr
USA	Georgia State University	ECE 3602 - Writing and Composing in the Digital Age	3cr
Australia	University of the Sunshine Coast	Teaching with Technology	12 unit
Australia	University of the Sunshine Coast	Using Data for Learning	12 unit
Finland	University of Turku	Introduction to Information Technology	3 ECTS
Finland	University of Turku	Digital Learning and Teaching and Media Education	3 ECTS
Australia	University of Tasman	Digital Technologies	1.5 cr
Ireland	Dublin city university	Designing, Learning with Digital Technologies	5 cr
Australia	The university of Newcastle	Knowledge and communication Technologies	10 units
Australia	The university of Newcastle	Media Arts Learning in Primary School: An integrated Approach	10 units
Malta	Institute for Education	Citizenship: Enriching Learning through Web-based Applications	3 ECTS

Referring to the results of the research, when foreign universities consider the scope of digital competence in primary education teacher curriculum, it is important to understand the possibilities and limits of media education and digital learning, and to have practical skills to use digital learning platforms and computer programs in various learning environments of basic education. On the other hand, Mongolian universities have formulated the content framework from

the point of view of ICT use and software. Regarding the content capacity unit (table 1), each country has its own measurement. For example, most schools calculate by credit hours, while countries like Finland, Malta, and Australia have different units. In Australia, ICT content is studied for 6-8 credit hours, while 3 ECTS (European Credit Transfer System) package hours are equivalent to 2 credits.

TABLE II. RESULTS OF THE RESEARCH (BY SUB-CRITERIA)

№	Criteria	Number of research units			
		Directly related	Indirectly related	Irrelevant	Total
1	Benefits	19	22	19	60
2	Pedagogy and ICT	15	17	13	45
3	Lesson Planning Considerations	17	34	24	75
4	Safety, Security and Well-Being	20	19	50	89
5	ICT Resources for Teaching and Learning	16	19	39	74
6	ICT Resources for Assessment	18	26	31	75
7	Sourcing, Evaluating ICT Resources	18	43	43	104
8	Classroom Technologies	21	25	44	90
9	Learning platforms	19	35	21	75
	Total	163	240	284	687

As mentioned above, the evaluation criteria were considered by the ICDL Syllabus document, and the contents that are not relevant to the analysis of the total 687 indicators are safety, security and well-being, indirectly related sourcing, evaluating ICT resources, and directly related classroom technologies. According to the overall analysis, Sourcing, evaluating ICT resources, classroom technologies, safety,

security and well-being criteria are heavily reflected in the content of the curriculum. These criteria belong to the category of selecting ICT resources, managing the learning environment, and more specifically, they depend on content skills such as recognize some methods for protecting data on computers and devices, be aware of the importance for teachers and learners of critically evaluating digital content.

TABLE III. RESEARCH RESULTS (BY CURRICULUM)

Criterion	National				Foreign										
	Curriculum 1	Curriculum 2	Curriculum 3	Curriculum 4	Montclair State University	Georgia State University	University of the Sunshine Coast	University of the Sunshine Coast	University of Turku	University of Turku	University of Tasman	Dublin city university	The university of Newcastle	The university of Newcastle	Malta Institute for Education
irrelevant	22	10	32	10	6	16	15	32	26	22	24	20	13	28	8
indirectly related	19	19	13	17	21	16	16	9	16	15	12	19	16	17	15
directly related	4	16	1	19	19	14	14	5	4	9	10	7	17	1	23

Furthermore, according to the results of the document research, primary education teacher curriculum should educate students and parents about the safe and responsible use of the internet, make students aware of some of the potential risks of using the internet, and teach them how to reduce risks. Also, the results of the analysis show that the countries have given importance to the content and skills corresponding to the criterion indicator, such as identifying the tools that help to use digital portfolio and knowing their main features.

TABLE IV. QUANTITATIVE MEASUREMENTS AND THEIR INDICATIONS

Measurements		Numbers
Number of documents		14
The total number of "Unit Objects"		687
From these	Directly related	163
	Indirectly related	240
	Irrelevant	284
Criterion	General criteria	4
	Sub criteria	9
	Indicator	46

The above results (table 4) represent the number of correlations and criteria for each indicator studied. Of these, 23.7% are programs with overlapping content that is directly relevant.

V. DISCUSSION

Despite the analysis of a small number of domestic and foreign schools within the framework of this research, there is a need to focus on providing continuous development of ICT teachers in the curriculum of primary education universities in our country, and to include assessment and planning skills rather than just computers and software. Therefore, relevant institutions need to reform the curriculum in ICT skills of students who are studying to be teachers.

VI. CONCLUSION

1. To discover how the problems of digital development of teaching are reflected in the long- and medium-term policies and planning documents of the development of the education sector, and to solve the problems that should be considered in the future, the issue of the cluster method approach, which is relatively new in education management, is discussed for the first time in the field, "Teaching Cluster System"- developed a version and used it as criteria and indicators for analysis.
2. In the quantitative analysis of this study, the main parameters such as the number of documents, the number of Excel sheets, the "unit object" of the study, the content included in the ICT curriculum of primary education teachers, criteria, indicators, and content results were selected, and a total of 687 indicators were developed by measuring them (Table 4). These indicators, which are the results of quantitative analysis, can be used as evidence for recommendations and conclusions given at any level of this research, as well as for other issues related to the content of this research.

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