



Current Situation of The Digital Transformation of The Mongolian Education Sector

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Abstract-- Digital learning is a comprehensive, innovative approach to the provision and management of education. In order to incorporate this approach into our education system, there is a need for the capacity building of human resources, incorporate distance education resources, adapt curricula and teaching methodologies to distance education, enhance students' and instructors' digital capacities, plan and develop a comprehensive open University system and diligently research the potential risks that are posed to our students' and instructors' wellbeing, privacy and security as a result of the digital transformation.

Policies and programs such as Mongolia's "Sustainable Development Goals", "Vision 2050 – Mongolia's long-term development policy", "Digital Society medium-term program 2022-2027", "2020 – 2024 Mongolian Government operational program". "Medium-term Education Sector Development Plan" have established the legal environment for the incorporation of digital technologies into the education sector.

As a result of the Covid-19 pandemic that has ravaged the world since 2019 a dire need to transform the development strategies, plans and education arose in countries across the world. Attempts to prevent and minimize the spread of Covid-19 further necessitated the development and conduct of online and hybrid classes and we have been using digital technologies to maximize the effectiveness of education in the New Normal.

The purpose of this paper is to determine the issues facing the digital transformation of education in terms of management, organization, curriculum, content, methodology, digital competencies of specialists, infrastructure, online resources, as well as education financing and propose solutions to some of the key issues.

Keywords--Distance learning, digital transformation, Information Systems, digital competencies, ICT, Information Technology, digital resources, resources, data.

I. INTRODUCTION

Key issues in digital education curricula are directly related to Delors' Four Pillars of Education. Areas such as digital education, digital literacy education, and digital citizenship tied to each other and will develop alongside each other in the long-term [25].

As a result of the Covid-19 pandemic that has ravaged the world since 2019 a dire need to transform the development strategies, plans and education arose in countries across the world. Attempts to prevent and minimize the spread of Covid-19 further necessitated the development and conduct of online and hybrid classes and we have been using digital technologies to maximize the effectiveness of education in the New Normal.

Digital technology not only builds the capacities of individuals but also reinforces the ability of individuals and society to learn and operate in an offline and online environment. Within this framework, international organizations recommended that we reflect the following considerations in policy:

- Education sector specialists (instructors, administrators etc.) need to be provided with comprehensive digital transformation regulations and standards consistent with technological advancements
- The education sector plan, national digital transformation strategy, and the overall ICT strategy needs to be interlinked and digital participation needs to become a guiding principle with an emphasis on a policy for the incorporation of technologies into education
- Provide a directive for the procurement of education resources, technologies and equipment for educational institutions.
- Financing for Information Communication Technology implementation, and student assessment development and monitoring systems (such as LMS and EMIS) needs to be reinforced
- An enabling environment for the effective use, sharing, and management of data needs to be established.
- Digital education and learning frameworks need to be reinforced and domestic and foreign standards need to be introduced in a phased manner.
- Open, online, digital, and distance education enabling environments need to be reinforced along with that of an online school.

II. CURRENT DIGITAL EDUCATION ENVIRONMENT

In order to successfully pursue digital transformation, distance education and learning frameworks need to be appropriately established with effective mechanisms for its management, regulation, and the provision of methodological support. As such, units for the digital transformation of education have been established at all levels of the government agencies. These units were tasked with supporting digital transformation in terms of policy, implementation, and infrastructure with an overall goal of enhancing the digital capacity of the country.

Issues related to the monitoring and sustainable operation education sector information system, online educational resources, management system, information database, and data center are being pursued in a comprehensive and diligent manner. Currently, 73.5% of public general education schools and 33% of higher education institutions within the single network are equipped with high-speed optic cables but Technical and Vocational Training and Education institutions and Early Childhood Education institutions are not connected to the network.

While the intricacies of Mongolian geography allow for the country to be connected to networks that encompass 56 satellites and other technologies, the highest speed available to the end-user is 4mbps and there is a dire need to increase this speed.

In response to the Covid-19 pandemic in 2020, the Mongolian government held high-level consultations with relevant stakeholders of the education sector and approved the "Covid-19 pandemic prevention, readiness, and response plan". This plan called for the implementation of distance and online learning initiatives in order to minimize the learning loss that would result from the closure of schools and these measures were successfully implemented.

Studies prior to the onset of the Covid-19 pandemic demonstrated clear deficiencies in the digital capacities of instructors with 73.3% of respondents lacking prior experience in distance education initiatives and 20% of respondents not possessing the capacity to utilize digital technologies. However, the Covid-19 pandemic forced instructors to develop their digital capacities and become acquainted with distance education methodologies within a very short period. They were also able to gain significant experience in distance education and adapt to this new format of education within their means. Moreover, the instructor ICT comprehensive capacity requirements were set by the Minister of Education and Science directive A/67 of May 2nd, 2020.

The "Online school" was established to allow high school seniors to pursue their elective classes without interruptions and to allow Mongolian children abroad to pursue the "Mongolian Language and Tradition" curriculum in order to provide them with a High School Diploma. The Online School continues to operate into the 2022-2023 academic year and has gained a significant amount of experience and expertise.

Beginning in 2021, the most preeminent educators across all of Mongolia developed distance education courses available to students regardless of time or location, thereby retaining the instructor-student relationship, creating the opportunity for instructors and students to learn from each

other, and creating a unified online content database. These developments led to the development of the MEDLE.MN platform.

This system allows instructors to participate in the creation and selection educational content according to curricula with the content with the best reviews becoming public goods through the platform. The content is also incorporated into secondary education operations. The platform currently encompasses 16,411 pieces of educational content and 520 classes.

Educational institutions are beginning to pursue digital transformation and are dedicating regional funding, other funding, and project resources to acquire computers and equipment. Currently, there are 28,356 computers in secondary educational institutions, 15,390 of which are laptops. There is a need to equip the 54,000 instructors with laptops that meet their technical requirements, and this issue is being considered by international organizations, public-private initiatives, and regional administrations. The creation of an adequate online education environment is just as important to the establishment of an online education framework as the provision of laptops and programs.

Digital education environments are being established under a number of names such as "Information Technology classroom" or "Online/smart classrooms", and "Online/smart classrooms". For example, as of 2022, there are 389 information technology cabinets, 66 multimedia studios for education content preparations, and 22 online/smart classrooms in secondary education institutions in 21 provinces and 9 districts.

Digitization of Early Childhood Education is also taking place with kindergartens and pre-schools being connected to the internet, providing instructors access to computers, and equipping premises with cameras, thereby increasing parental monitoring.

The Ministry of Education and Science funding for digital transformation has also increased to 0.5% Ministry of Education and Science funding for the general education operating budget through new funding structures.

Some universities and schools have also established working groups on resolving the issues around the financing and challenges of procuring programs, licenses, and other technological requirements for instructors and students. Moreover, in order to enhance the social security of instructors, agreements have reached with 6 banks to establish the "Instructor" banking service.

General education institution, and Higher Education Institution references are now available through the "Government Service Digital Machine" and documents such as general education certificates, higher education diplomas, final examination and entrance exam results are now available through the "Government Service Digital Machine" and E-Mongolia platform. Moreover, early childhood education and first grade admission request, registration, and responses are also available on the E-Mongolia system.

III. CHALLENGES AND POTENTIAL AVENUES FOR SOLUTION

As a result of the COVID-19 pandemic, 172,300 students in 330 provincial schools as well as 6,277 students in 46 district schools for a total of 178,577 students were not able

to be encompassed in online education initiatives due to challenges such as lack of infrastructure, access to internet, lack of electricity or other technology (Ministry of Education and Science, Mongolian National Institute for Education Research). Discussions with provincial and district education agencies, educational institutions and early childhood education administrators demonstrated that approximately 4-6% of students were not able to take part in tele-classes with the disparity resulting from regional intricacies and did not have access to working information technologies. The majority of those students were from the provinces and were children of herders far from population centers. As a result of their nomadic lifestyle according to the seasons, these students rarely have the time for studies and the situation is confounded by wind and storms contributing to power outages. It is also not infrequent for internet access to be unstable as a result of an inability to pay for the internet. Some other students simply lack adequate technical equipment and the culmination of these factors lead to a lack of tele-class access to students. Therefore, the provision of smart equipment to these children is an issue of the highest importance. Moreover, the main challenge facing instructors when preparing their classes is the lack of equipment and studios for the development of content. The World Competitiveness Yearbook demonstrates that while Mongolia's digital competitiveness ranking has improved to 96th among 146 countries, it also leaves significant room for improvement. [21].

The education sector information and communication technology infrastructure is also lacking. While public and regional secondary education have been incorporated into a single education sector network, schools, dormitories and early childhood education institutions lack full access to the internet. Moreover, the environment for internal networks is not currently established, there are no positions for network specialists at many educational institutions, and where the position does exist, a lack of adequate compensation leads to an inability to attract qualified specialists. This leads to a significant challenge in human resources [2].

Open educational resources (digital educational resources, tele-classes, audio, video, online classes, content, interactive, independent activity workbooks etc.)-are being developed but there is a lack of engagement from students and there is no single database for students at all levels.

Data, information security and usage is still weak. Education technology development M&E, and assessment data is incomplete and inadequate.

Although education sector digitization policy and plans are being implemented, the need to strengthen them was reflected in the "Comprehensive education sector information communication technology".

Digital learning offers equality and flexibility in education and has established itself as the mechanism through which to impart XXI century competencies. Therefore, an increase in funding for digital transformation, innovating educational methodologies, and the digitization of educational services are integral initiatives at the national level. The following are a set of requirements that would be essential in those pursuits:

- Development of a digital education policy and enabling environment, digital transformation long-

and medium-term plans, and provision of required funding and resources;

- Development of complete Education Management Information Systems (EMIS) at all levels of education, ensuring access and security of data to drive policy development, planning, monitoring, analysis, and assessment initiatives;
- Systematic digital capacity building of instructors, teachers, and administrators at all levels of educational institutions. Development and incorporation of instructor a professional development "Instructor platform";
- Development and incorporation of open educational resources, a unified database, an education platform and creation of an opportunity for their free, equal, and open access;
- Establishment and development of infrastructure to erase digital divide and information safety concerns while also ensuring flexibility and a reliable network;
- Digital citizenship education needs to be provided. This would encompass education on the safe, ethical, and appropriate use of technology.

IV. CONCLUSION

Mongolia's long- and medium-term development policy and planning documents encompass the provisions for the education digital transformation. "Vision 2050", "Education Sector Medium-term Plan 2021-2030", "Digital Society Medium-term Program", "2020 - 2024 Mongolian Government Operational Program", "Cyber Security Legislation", "Information Security Legislation", "Child Protection Within an Online Environment" are just some of these regulations and legislations.

Moreover, the following activities have been undertaken in order to establish the basis of a digital education framework with them already delivering tangible results:

- Education sector digital transformation policy implementation and infrastructure enhancement frameworks have been set in place;
- Education Management Information System (EMIS) are being introduced at all levels of education and education services are being digitized in a phased manner;
- The MEDLE.MN platform has been developed and introduced to offer lifelong opportunities for students and instructors regardless of time and place;
- A comprehensive education network was established and the information technology infrastructure capable of handling information flow and content usage flows has been established;
- Instructors are enhancing their digital competencies, undertaking short-term distance education trainings, organizing distance and online education initiatives within their capacity, and have acquired a certain level of experience;
- "Online school" has been established to provide high school seniors without the possibility to pursue elective studies within a classroom format to still take

the class online in order to ensure there is no learning gap;

- Budget and financing reforms now allow for 0.5% of operating costs of education sector funding to be dedicated to digital transformation.

REFERENCES

- [1] UNICEF, "Feasibility study into the incorporation of digital platforms in Early Childhood Education and general education curriculum" Ulaanbaatar, 2020.
- [2] UNESCO. Ministry of Education and Science, "Comprehensive assessment of the implementation of Goal-4 of the Mongolian Sustainable Development Goals (2016-2021)," Ulaanbaatar, 2022.
- [3] Ministry of Education and Science, "General Education Learning Gap Impact Minimization Plan (2021-2023)," Ulaanbaatar, 2021.
- [4] Mongolian National Institute for Education Research. Ministry of Education and Science, "Research report on determining out-of-school children" Ulaanbaatar, 2021.
- [5] UNICEF. IRIM. Ministry of Education and Science, "The results and effectiveness of tele-classes implemented during extraordinary circumstances", Ulaanbaatar, 2020.
- [6] Ministry of Education and Science, "Report on the minimizing the impact of Covid-19 on the education sector" Ulaanbaatar, 2021.
- [7] Ministry of Education and Science, "Report of the working group on Higher Education institution digital education environment, and operation M&E and assessment" Ulaanbaatar, 2021.
- [8] National University of Mongolia. UNICEF. Ministry of Education and Science, " Psychosocial risks for children during school closure," Ulaanbaatar, 2020.
- [9] UNESCO, "UNESCO Covid-19 Education Sector Response, Issue №2,5-2020/06," Ulaanbaatar, 2020.
- [10] UNESCO, "Mongolia, Education policy review: towards a lifelong learning system", Ulaanbaatar 2021.
- [11] UNESCO, "Education Policy Review Mongolia," Ulaanbaatar, 2019.
- [12] Mongolian Parliament, "Vision-2050" Mongolia's long-term development policy", Ulaanbaatar, 2020.
- [13] Mongolian Parliament, 2020-2024 Mongolian Government Operational Plan, Ulaanbaatar, 2020.
- [14] Ministry of Education and Science, "Report on enhancing the education of remote and rural herder children" project final report, Ulaanbaatar, 2017.
- [15] Ministry of Education and Science, Education Evaluation Center. "Report on the preparation of students for school," Ulaanbaatar, 2021.
- [16] Ministry of Education and Science. Mongolian National Institute for Education Research, "Curriculum competency assessment", Ulaanbaatar, 2022.
- [17] Ministry of Education and Science. Mongolian National Institute for Education Research, UNESCO, "Transforming Education" national consultation report, Ulaanbaatar, 2022.
- [18] Ministry of Education and Science, "Education sector medium-term development plan (2021-2030)," Ulaanbaatar, 2020.
- [19] Ministry of Digital Development and Communication, "Digital society medium-term development program, 2022-2027," Ulaanbaatar, 2021.
- [20] K.Schwab. The global competitiveness report, 2019. in the World Economic Forum (Vol. 9, No. 10). 2019, December.
- [21] UNESCO, "Remaining our futures together a new social contract for education," 2021.
- [22] OECD, "21st-Century readers developing Literacy Skills in a Digital World," 2021.
- [23] UNESCO. Dubai Cares, "The rewired global declaration connectivity for education", Dubai, 2021
- [24] United Nations. "Transforming education summit 2022", 2022