

7.7 Expanding educational equity by e-Learning in South Korea

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1. Introduction

South Korea's rapid economic growth is known due to the appropriate skills for the workforce [Lee, 2005]. The development in education was made possible by the high social attention and investment. The quantity of education has been accomplished, and the quality of education is recognized by global comparative studies such as PISA. South Korea has participated in PISA (Program for International Student Assessment) from the early stage and has shown very high performance since its participation until now. According to the 2022 PISA results, Korean students demonstrated high achievement in all areas: mathematics, reading, and science. Specifically, among OECD member countries, Korea ranked 1st-2nd in mathematics, 1st-7th in reading, and 2nd-5th in science. Globally, out of 81 participating countries, Korea ranked 3rd-7th in mathematics, 2nd-12th in reading, and 2nd-9th in science. Korean students showed very high average scores in academic achievement, and the impact of socio-economic status on achievement was relatively low. However, equity of access has been a continuing problem in the education sector in South Korea, and various trials have been in place without serious results. Yet the equity of education in Korean society has been a sensitive issue all the time. The digital education was introduced to increase students' performance as well as the equity of education.

Every decade or so, learning and human performance technology gets a new medium through which it can inform, communicate, interact, empower, and enlighten. Wireless computing is such an example, and small, yet powerful devices are another. The new technologies provided suitable devices for learning of both content and collaboration purposes, and as such are viable alternatives to the desktop PC as well as classroom face-to-face instruction. Trendy terminologies were introduced like m-learning (mobile), u-learning (ubiquitous), t-learning (tele). Surely those technologies provided a new way of learning, and such a new way of learning was called e-Learning integrating various layers such as e-Learning as CBT (computer based training), eLearning as online/cyber education, e-Learning as SDL (self-directed learning), e-Learning as KMS, e-Learning as e-Business [Chung, 2004]. There

have been new names when new digital technologies were introduced in education, and here I use the terminology “e-Learning” as a term to include various ways of digital learning with electronic devices. Here I would like to share the e-Learning of South Korea (2000-2020, approximately) at glance.

2. National plan for e-Learning

The Ministry of Education and Human Resources Development announced the first 5-year comprehensive development plan for ICT in education in 1996, and the plan was updated every 5 years. The last plan was announced in February 2022. The plan of ICT in education attracted high attention, but now it is no longer the primary policy in the ministry.

The comprehensive national plan for ICT in education included policies for primary and secondary schools as well as higher education institutes. It includes the dissemination of instructional use of ICT, distributing infrastructure for ICT in education, such as H/W, S/W, network, teacher education, curriculum, and instructional materials development, updates of regulations, and promotion policy to create an educational technology market environment.

Over the years, the financial support regulations at the government have been changed: the central government cannot organize and send a budget to support schools at all levels directly, and educational informatization must be promoted through local education finance. However, local finance conditions that prioritize the expansion of educational welfare services rapidly reduced the budget investment related to digital education, and the utilization of educational informatization in schools was repeatedly declining.

e-Learning readiness

For the practice of e-Learning, a few conditions should be met. The primary prerequisite for e-Learning is to provide infrastructure, such as a network, H/W, and S/W. In 2003, when the ROK population was 47M, the readiness of e-Learning in the ROK was highly recognized by renowned international institutes, such as the world's highest broadband diffusion rate [WEF, 2003]. A few more statistics were reported that the number of broadband users were 11M [KRNIC, 2003], development of ICT that Korea made for 40 years was a miracle [ITU, 2003]; wide spread of eLearning environment: Korea ranked top 5 for e-Learning Readiness in 2003 (EIU, 2003) Korea ranked top 4 by rate of people who had PCs in 2002 according to OECD report, Korea ranked the top 4th by the rate of people who had PCs in 2002. The early 2000s were the time when the ROK was proud of its accomplishments in the world of internet development. There was an emerging technology for classroom instruction like replacing a desktop PC or notebook computer with a PDA, and a cable or phone line network connection with a wireless LAN, which significantly lowered the cost of bridging the digital divide

In early 2000s, wireless LANs and mobile learning (m-learning) are still in their infancy. The principal advantage of using a wireless device for electronic learning is convenience and cost effectiveness. Because of its portability and low cost, this concept can also be applied to basic education in rural and remote areas. This will greatly expand the equity of educational opportunities and contribute to reducing the digital gap in the country. The workshop will review recent developments in m-learning and examine the feasibility of applying the concept

in the education sector, particularly in basic education.

It was said that the early 2000s were a knowledge economy, and Korean society moved fast in the direction of ICT with the network in society. Due to this trend, as of 2004, 69.2% schools are networked with 2Mbps, 99% K-12 schools have a homepage web site, and all k-12 schools provide computer subject in their curriculum.

3. KERIS, the engine for e-Learning

In the 1990s, Korea ambitiously pursued the high-speed information and communications network project to promote national informatization. As part of the high-speed information and communications network project, the government established a comprehensive plan for education informatization. In February 1988, the Computer Education Research Center was established within the Korea Educational Development Institute to exclusively promote the education informatization project (the policy name at the time was “Computer Education Research Project”).

The Computer Education Research Center was reorganized into the Educational Technology Headquarters in February 1995, and expanded to a research headquarters dedicated to education informatization with 45 employees. Later, on June 21, 1996, the “Multimedia Education Research Center” was established as an affiliated organization of the Korea Educational Development Institute to promote the multimedia education support project efficiently. This became the foundation for the Multimedia Education Support Center, which was launched on March 21, 1997, by the government’s education reform plan.

On May 31, 1995, the “Education Reform Plan for Establishing a New Education System,” the most important educational innovation plan in Korean education, was announced. The background of the new education system concept is informatization and globalization. In this reform plan, to establish an open education society and a lifelong learning society, it was proposed to promote educational informatization across the government and to establish a technical foundation for anyone to receive the education they want, anytime, anywhere, by establishing the “National Multimedia Education Support Center.”

The Multimedia Education Support Center was launched through the KEDI Computer Education Research Center → KEDI Educational Technology Research Headquarters → KEDI Multimedia Education Research Center, and its main history is as follows.

- 1996. 6. 21: Temporary establishment of the "Multimedia Education Research Center" as an affiliated organization of the Korea Educational Development Institute
- ※ Resolution of the Educational Information Promotion Subcommittee (1996. 4. 4)
- 1998.5. 18. Establishment of KERIS (Korea Education and Research Information Service)
- 1999: Comprehensive development plan for education informatization began
- 2002: Designated as the center of operation of the National Education Information

System (NEIS).

- 2002: EduNet service launched.
- 2003: Research Information Service System (RISS) operated with the participation of all universities and research institutes
- 2012: New building opened and Cyber University Comprehensive Information System (CUinfo) launched.

Since then, KERIS has been operated as an institution that comprehensively supports educational informatization of primary and secondary schools and higher education in Korea.

4. e-Learning for primary and secondary education

Most of the primary and junior secondary schools and half of the senior high schools in Korea are public schools, and even the rest of the private schools are mostly supported by the government for their operation. Therefore, the government policy influences their practice heavily. The Ministry of Education and Human Resources Development promoted the ICT education development plan in two tracks: the construction of physical infrastructure (PCs and the installation of the Internet in all schools), and distributing teaching and learning materials and methods utilizing ICT through EduNet, etc. This contributed to the country achieving a high e-learning readiness level to be fifth in the world [EIU, 2003].

When the first comprehensive development plan for ICT in education was introduced, the first track of providing infra-structure installation in all classrooms were done rather effectively and at the same time for the second track of using ICT in education, it was promoted to use e-Learning at least 10% of the instruction time and teachers were encouraged to use ICT at least 10% of classes. The whole country was full of the spirit to develop ICT as fast as possible which was represented in the national slogan: “we were late for the industrial revolution but we can go fast for the information revolution”.

EBS e-Learning project

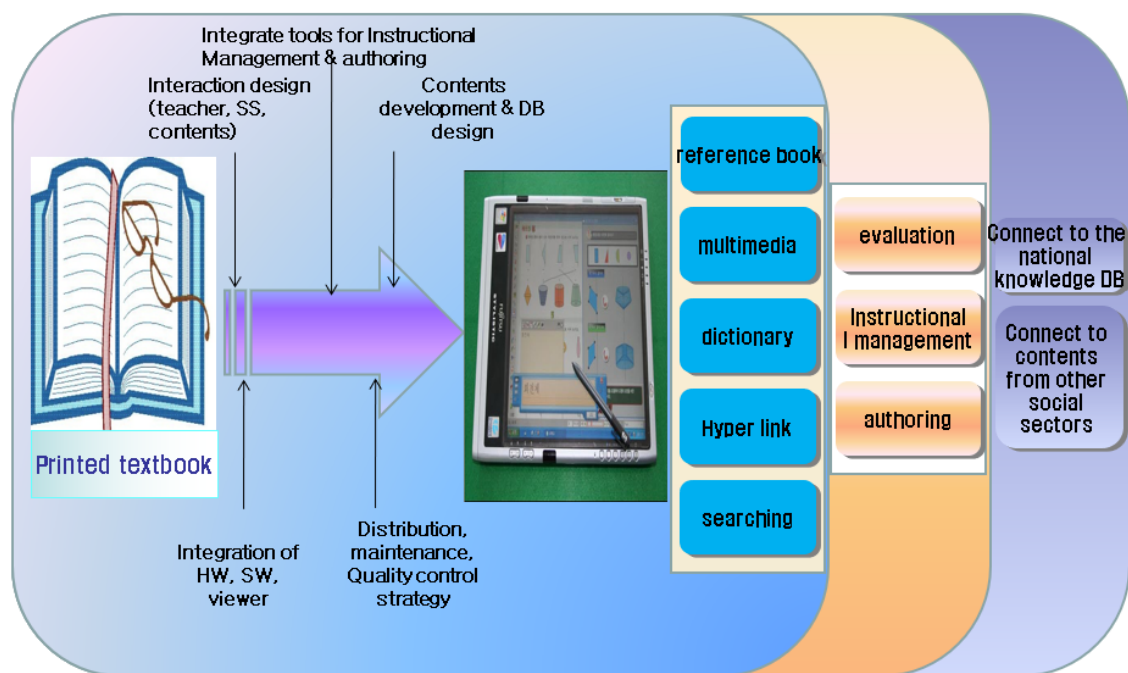
Korean society has suffered from the heavy burden of private tutoring costs for many generations. It was one of the chronic social problems. The Ministry of Education and Human Resources Development decided to provide quality after-school tutoring for free. It was to utilize the public EBS CSAT (Educational Broadcast System, College Scholastic Ability Test (CSAT)) broadcast and online lectures from March 2004. To this end, EBS has specialized “EBS Plus 1” as a CSAT channel and developed programs centered on students with mid-level academic performance, while simultaneously producing lecture materials for lower-level students who fall short and upper-level students who excel, and began providing these services free of charge as VODs through EBS, EduNet of the Korea Education and Research Institute (KERIS), and the national internet network of city and provincial offices of education. Delivery of EBS contents was Video on demand (VOD) via online (EBSi,

EDUNETi), and Q&A via the internet was provided. It means that EBS provided personalized tutoring: providing video content and an LMS (Learning Management System).

The policy, which was to relieve extra-curricular lesson costs through EBS contents, became active from April 2004, providing high school curriculum contents. 70% of CSAT (College Scholastic Ability Test, the national test for university entrance) should represent the contents from the EBS. Many students and teachers became familiar with e-Learning through this EBS service. 93% students participated in the EBS eLearning project, and this policy reduced the private lesson cost by 19.8% (Jacobson, 2004). This policy of using EBS e-Learning against the high cost of private tutoring has been in place until now, 2025, but the regulations for CSAT are no longer.

Digital textbook

As society experiences the benefits of digital technology, the education sector has also gone through a digital transformation. When educational administration used digital technology effectively, instruction (curriculum, teaching, and learning, collaborative instructional activities, etc) was put at the top of the list for the digital transformation in education. Those existing printed textbooks had limits as an instructional medium for students, and digital technology could help to overcome those limits. The contents of the textbook are quickly outdated in the rapidly changing world. It is limited to the quantity of content. To cope with the new contents within the formal curriculum, multimedia content should be available in various formats, such as a dictionary or a notebook. Limitations like location and time is less problem no exist for digital textbook. Even though the benefits of digital textbooks are many, it was urgent to gain the trust of teachers and parents. After nearly 20 years of pilot test, the digital textbook was not actively used in the formal educational classrooms. However, due to this trial of digital textbook, e-Learning in education could be accepted rather easily during the covid 19 quarantine.



[Fig 1] Functions of digital textbook [Song, 2009]

5. e-Learning for higher education and industry training

Unlike K-12 education, higher education institutes are operated with a certain degree of autonomy. The regulations and recommendations as government policy did for the primary and secondary schools could no longer play a pivotal role for universities. However, from the performance management perspective, e-Learning by individual faculty members was practiced with support from the university, which can lead to receiving financial support from the government.

It is hard to summarize how e-Learning was practiced at universities, as they are very different and took vastly diverse approaches from one university to another. Yet, it is known that blended learning as a form of e-Learning was the most popular format for the university classroom during the early 2000s until COVID-19 stopped university face-to-face classroom instructions in 2020.

Yet, there were universities where e-Learning is the main medium of instruction: open university and cyber universities.

Open university

The most prominent university in South Korea by the number of enrolled students is the Open University (KNU: Korea National University of Broadcasting and Communication),

with 104,613 students as of 2024, which is the largest university in the country. As technology develops, the medium of instruction has evolved from tele-video and audio to digital video.

While the Ministry of Education and Human Resources Development's "Education Information Promotion Implementation Plan" is focused on formal education, which accounts for a quarter of the population, information education-related projects for the remaining three-quarters (middle-aged and elderly, disabled, women, the poor, and rural areas) were overlooked. The Open University played an important role in providing services to those underprivileged at a low tuition, based on independent e-learning specialists, with support from the local university/learning center systems. The e-Learning service at the Open University is based on a unique law system: the Ministry of Education and Human Resources Development's Lifelong Education Law, the Ministry of Information and Communication's Online Digital Contents Industry Promotion Law, the Ministry of Industries' e-Learning Industry Promotion Law, and the Ministry of Labor's Regulation for the Internet Communication-Based Training System.

Cyber university

In 2000, a pilot cyber university opened, and in 2001, the Ministry of Education and Human Resources Development approved the new form of higher education. At this cyber university, the major medium of instruction is e-Learning.

In 2000, MOE promulgated the Lifelong Education Law, and the cyber university was formed as a supporting system for educational equity. The cyber university was to provide the educational equity of the vulnerable population, but quickly it became the educational institute for people who wanted to update their job skills to repeat their education at a higher educational institute without time and place restrictions. The policy of cyber university was to cope with the financial crisis in 1997, creating a new market for ICT in education.

[Table 1] growth of cyber university

	2001	2002	2003	2004
# of cyber univ.	9	15	16	17
New entrants	6,220	16,700	25,850	23,800
Total entrants	6,220	22,920	46,770	70,570
Actual enrollment	84.2%	54.1%	46%	44%

At the beginning of the cyber university, the enrollment rate dropped to remain low: in 2001,

84.2% to in 2004, 43.9%. This enrollment rate has improved as the social recognition of the cyber university became positive.

6. Industry training & development of e-Learning industry

Industry training

Mobile learning offers enterprises the ability to keep their employees engaged in ongoing learning activities that will enhance their productivity and effectiveness while they work. e-Learning can deliver “just-in-time learning” to enable workers to solve immediate problems and remember the solutions.

For corporate training, e-Learning became very popular. In January 1999, the Ministry of Labor promulgated the Vocational Training Promotion Act, which allows e-Learning for laborers to be eligible for Employment Insurance Refund. This policy provided the quantum leap for the vocational training industries to use e-Learning. In 1999, e-Learning in industry training was 2% and increased the rate to 30% in 2004 [Chung, 2003]. The e-Learning eligibility for Employment Insurance Refund was in action from 2002, and the internet-based training labor drastically increased to be 29 times bigger compared to the number of e-Learning trainees in 1999. Totally 35% of all labor trainees took the e-Learning training in 2004 and grew drastically to make majority of cooperate training to be e-Learning. However, this new trend of training was mostly available in the big companies rather than small and medium-sized enterprises.

Development of the e-Learning industry

The law to subsidize industry training costs by the Ministry of Labor provides a boost to e-Learning providers. In 2003, the private sector of the e-Learning market was estimated to be 1 billion US dollars, and in 2024, it is 10 billion US dollars, which shows that the e-Learning market for corporate training has grown 10 times in 21 years.

Another new market for e-Learning is the Hakwon (after-school) classes. Star lecturers on internet classes became celebrities and rich. The young and rich class was produced through the new market. The most popular lecturer on e-Learning produced huge profit, and those companies that have many of those top subject lecturers could go for IPO in the stock market to become profitable companies.

With the e-Learning corporate training by e-Learning and Hakwon internet class, the market was big enough to create an ecosystem.

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