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THE USE OF TECHNOLOGY IN EDUCATION: LESSONS FROM SOUTH KOREA

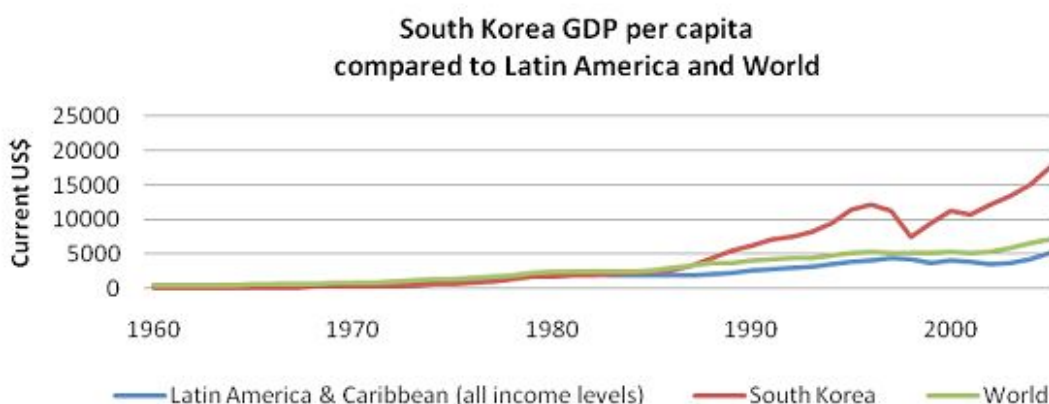
Summary: South Korea is an exemplary case of rapid economic and educational growth. Central to this growth have been decades of continuous investments in education and human capital, in which the integration of technology in education has played a major role. This is a sharp contrast to Latin American countries, where educational technology plans are short-lived, lack continuity, and are strongly affected by changes in political administrations. As seen in South Korea, educational technology should be part of a long-term investment plan that is carried out irrespective of changing political administrations. Here we describe characteristics that contribute to South Korea's educational success and how they can inform Latin American education policies.

The Rapid Economic and Educational Development of South Korea

South Korea is an example of extraordinary economic development. In 1960, the per capita GDP of South Korea was one of the lowest in the world. By standard income metrics, it was considered less developed than most Latin American countries, including Belize, Brazil, Honduras, and Peru. However, from 1960 to 2000, while Latin American countries displayed stagnant growth, South Korea's per capita GDP grew an average annual rate of approximately 6%. Even though South Korea is a small country in terms of land size (99,000 km²) with limited natural resources, this small nation enjoyed expedited development progression to a developed country and became an OECD DAC member in 2009. South Korea is also considered a highly equal country. In 1998, South Korea's Gini coefficient reached 31.6 points--significantly lower than that of Uruguay, which is considered the most equal country in Latin America, with a Gini coefficient of 42.3 points (World Bank, 2011).



In recent years, South Korea has consistently ranked among the top three in international standardized tests such as the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS). South Korea's education system recovered quickly from the devastation of the Korean War from 1950 to 1953. By 1970, adult literacy rates reached 88%, compared with 22% in 1945. In the mid-1970's, only 7% of students were enrolled in higher education institutions. Today, 95% of students graduate from high school and more than 70% continue to higher education institutions. Comparatively, Latin American countries have seen varying rates of graduation. In Chile, 80% of students graduate from secondary school but in countries such as Guatemala and Nicaragua the graduation rate is closer to 30%. In all, 55% of Latin American students complete secondary education. Not all Latin American and Caribbean countries participate in international standardized tests but those that do typically perform below the OECD average.



Factors that Contribute to South Korea's Education Success

By learning from South Korea's dramatic improvements in the past several decades, Latin America too can achieve great educational progress.

Education is of high social and cultural value. Despite abundant government funding for education, individual families spend a large portion of their own incomes on supplementary education. In 2007, families spent an average of 12% of their income on supplementary education such as extra-curricular test preparation (Hyo-sik Lee, 2008). School-aged youth are encouraged to spend the majority of their day studying. This is one of the most distinctive and exemplary characteristics of South Korean society: its social and cultural emphasis on education.

"The future of Korea's competitiveness among 21st century knowledge-based societies hinges on the successful cultivation of competent people who are creative, independent and able to process new knowledge and information effectively."
- KERIS -

Education is at the center of South Korea's long-term development strategy and closely linked to labor market demands; it is also a high priority for policy makers. South Korea's development strategy, labor market needs, and education priorities are strongly aligned. Every five years, the Ministry of Education, Science and Technology (MEST) revises and reforms the national curriculum based on changing economic and national conditions. The prioritization of technology in education is a means to achieve a workforce that is ready for the 21st century knowledge society. The biggest distinction between this approach and the approach taken by most Latin American countries is that in South Korea, education is at the center of long-term economic development strategies whereas in many Latin American countries, education is often at the periphery of development strategies.

Teaching is a professionalized, respected, and well-paid career. In South Korea, only graduates in the top 5% of their class can become teachers. This makes the teaching profession prestigious and ensures consistency in teacher quality. In Latin America, the teaching profession carries less prestige and the requirements to become a teacher are much lower; teachers enter the profession with varying academic credentials. Teacher salary is high in South Korea and increases over time, encouraging teachers to remain in the profession long-term. In 2006, the starting salary for teachers was US\$ 28,569, which is higher than the OECD average (US\$ 25,727). After 15 years of teaching, South Korean teacher salaries increase to US\$ 49,000, which is significantly higher than the OECD average (US\$ 35,099). Even in Chile, where teacher salary is higher than other Latin American countries, the starting salary is US\$ 10,922 (UNESCO, 2006).

ICTs in the South Korean Education System



Educational technology is part of South Korea's long-term vision of preparing its population for future labor markets and bridging gaps in access to quality education. For decades, South Korea has sustained the continuous incorporation of technology into education. Most recently, it became the first country in the world to replace traditional textbooks with digital textbooks.

Teacher training is at the core of every educational technology initiative. Official ICT teacher training programs exist in each province, allowing teachers to obtain credits for taking ICT classes. Many of these trainings are offered online. In 2006, the Ministry of Education and Human Resources (MOE&HRD) and the Korean Education and Research Information Service (KERIS) revised teacher training programs to include strategic incorporation of technology in classrooms. Now, teacher training on ICTs consists of four components: (1) basic use of ICTs; (2) applications of ICTs; (3) advanced studies of the teaching of school curricula; (4) innovative leadership. This new program has helped teachers use technology more effectively in their classrooms; 72% of all Korean teachers use technology in their classrooms (KERIS, 2006). Increasingly, teacher trainings are conducted online, via e-learning platforms. Highly trained teachers are the backbone of South Korea's successful educational technology integration.

E-learning platforms are used to reinforce curricula, enhance communication, and bridge gaps in access to quality education.

Digital Textbook

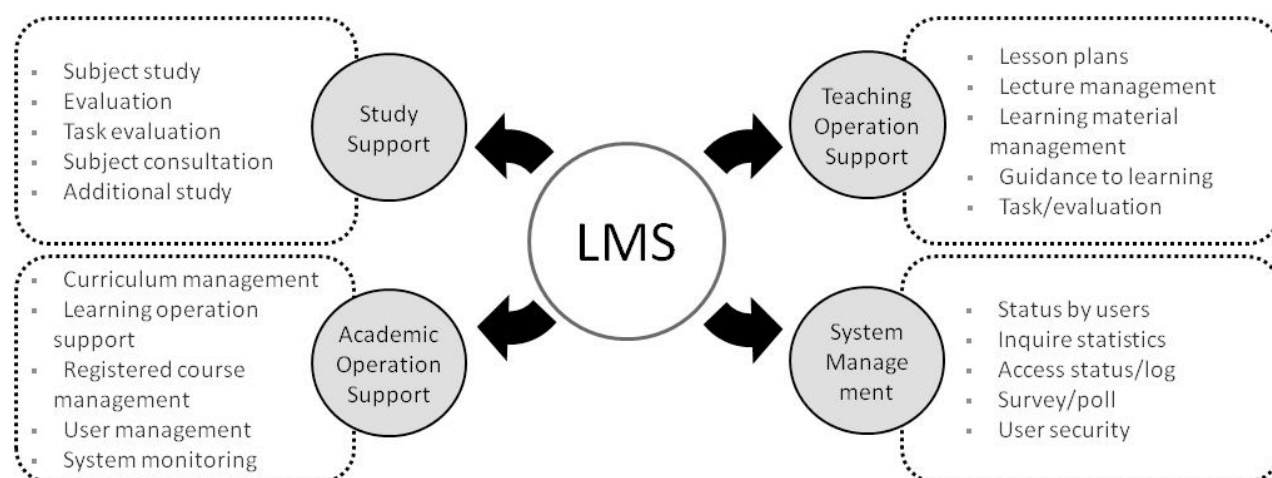
South Korea's initiative to replace traditional textbooks with interactive digital textbooks is the first of its kind. These digital textbooks include the content of existing textbooks, reference books, workbooks, glossaries, etc. and integrate these with digital media such as video clips, animation, and virtual reality. The textbooks are interactive and can be customized for each student's characteristics and academic level (MEST, 2008). The digital textbook requires a platform, supporting systems and application programs. In 2009, the platform and support systems were improved so that the digital textbook can be used regardless of computer operating system. To promote their creation and dissemination, the Digital Textbook Promoting Plan was established to construct an educational platform for nurturing human resources demanded by the knowledge-based society by providing high quality digital textbooks suitable for the educational environment of the future and to reinforce the goal of "Knowledge Korea" by establishing the national database for teaching-learning and by exporting such content worldwide.

Digital vs. Printed Textbook Comparison		
Descriptions	Digital Textbook	Printed-version Textbook
Learning Place	Online + Offline	Offline only
Media	Various digital devices	Printed media
Type of Data	Multimedia	Flat, linear data
Learning Method	Learner-centered	Teacher-centered
Interaction	Multi-directional exchange among teachers, students and textbooks	Single-direction teaching and learning activities
Linkage among Texts	Linked among subjects	Difficult to link related data among subjects
Data Conversion	Prompt conversion	Conversion impossible
Learning by Study Level	Implementation of learning by study level, customized to learner	Difficult to customize to learner's level or to implement one-to-many learning

Source: KERIS, 2009

Cyber Home Learning System

The large percentage of family income spent on supplementary education in South Korea led to great inequality in access to supplementary education among students with high and low resources. In 2004, the government addressed this problem by establishing the Cyber Home Learning System to “enhance the quality of public education, reduce the amount spent on private education, and bridge the education divide between regions and between classes” (Chang, 2008). It provides students with supplementary learning content to study voluntarily at home through the Internet to reduce the cost of private tutoring and to eliminate the education divide in elementary and middle schools. The program is used by more than 3 million students, half of whom come from rural areas or lower-income backgrounds.



The Cyber Home Learning System manages the attendance, progress, and evaluation results of learners based on the Learning Management System (LMS). It helps students engage in learning experiences in a systematic manner while enabling online teachers to provide appropriate support.

Operation of e-Learning Quality Control System

With the widespread implementation of e-learning in various educational contexts, South Korea implemented a certification process to control for the quality of e-learning programs. To support the quality of comprehensive e-Learning industries, the government establishment the ‘The e-Learning Industries Development Law’ in January, 2004. KERIS has been operating the Quality Certificate System for Educational Contents since 1998. In 2006, KERIS constructed the Quality Certificate System for e-Learning Content, a systemized form of the Quality Certificate System for Educational Content.

Technology platforms are used for administrative purposes. In addition to using technology directly in classrooms, the South Korean government has also launched and maintained platforms that organize and manage education-related administrative data. Examples of these platforms include the National Educational Information System and the Education Information Disclosure System.

National Education Information System

To facilitate school administrative matters such as salary payments, personnel information, school admissions, health and academic affairs, the South Korean government created the National Education Information System (NEIS).

This system links information from 10,000 elementary and secondary schools, 16 municipal education offices, the MEST, and other affiliated institutions nationwide to efficiently perform administrative educational tasks.



Photo Credit: "Yonhap News Agency"

NEIS processes and stores various information produced by educational institutes and provides them to users for the purpose of supporting prompt decision making when establishing educational policies, enhancing efficiency in educational administration, insuring substantiality in public education and improving services to users.

Education Information Disclosure System

All student and school information is available to parents and students at any time via an online system. The School Information Disclosure System in Elementary & Secondary Schools contains information regarding school regulations, student status, teacher status, educational environment, educational activities, school achievements, test results, and national standardized test results. The system guarantees the students' and parents' right to know and, consequently, increases parent and local community interest and participation. It is also useful if students need to switch schools for any reason; their information is stored in an online database that follows them to whichever school they attend. The site is heavily used, receiving roughly 20,000 visitors per day; 7.7 million people have visited the site since its launch in 2008.

Over the past forty years, the Korean incorporation of ICTs in education has evolved **continuously**; it began in 1970, when a decree mandated that educational computing be incorporated into higher education and high schools. Since then, a number of policies have been instrumental in creating the appropriate technological infrastructure for educational technology to flourish.

South Korea's success in educational technology integration is a result of decades of continuous work. In Latin America, all too often educational technology plans are short-lived and lack continuity due to changes in political administrations. As seen in South Korea, educational technology should be part of a long-term investment plan that is carried out irrespective of changing political administrations.

Educational Technology Policy Progress				
Policy	Master Plan I (1996–2000)	Master Plan II (2001–2005)		Master Plan III (2006–present)
Infrastructure	<ul style="list-style-type: none"> – ICT infrastructure in all schools – Internet access in classrooms – One PC given to each teacher 	<ul style="list-style-type: none"> – Continued growth of technological infrastructure 	<ul style="list-style-type: none"> – All high schools given new computers, Internet connections bet. 2 to 10 Mbps, projectors, and televisions 	<ul style="list-style-type: none"> – Emphasis on incorporating multiple platforms (such as mobile phones) into education for ubiquitous learning
Content	<ul style="list-style-type: none"> – EDUNET educational portal created 	<ul style="list-style-type: none"> – Content development & distribution – Launch of Education Resources Sharing System (ERS) 	<ul style="list-style-type: none"> – Cyber Home Learning System launched – Educational Broadcast System (EBS) launched for university entrance exam preparation 	<ul style="list-style-type: none"> – u-Learning (ubiquitous learning) project launched – Digital textbooks
Human Resources	<ul style="list-style-type: none"> – Plan to train teachers in ICTs implemented 	<ul style="list-style-type: none"> – Continued teacher training for ICT use 	<ul style="list-style-type: none"> – “Official”, for-credit teacher training for educational ICT use 	<ul style="list-style-type: none"> – New teacher training that focuses on the incorporation of technology into curricula launched
Management	<ul style="list-style-type: none"> – Korea Education and Research Information Service (KERIS) formed 	<ul style="list-style-type: none"> – National Education Information System (NEIS) which contains records of every student and teacher launched 		<ul style="list-style-type: none"> – Education Cyber Security Center (ECSC) formed – Global partnership for ICT in Education – Online Education Disclosure System launched

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