Policy Formulation and Implementation in the Use of Information Technology for Distance Education : a Case of Korea

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1. Historical Background

During the 1970s and 1980s, the number of students in secondary education had increased sharply, which gave rise to overkeen competition for places in the higher education institutions. Solutions to this explosion at the middle and high school levels included an expansion of vocational educational programs and the establishment of the Air and Correspondence High School (ACHS) and the Korea Air and Correspondence University (later renamed the Korea National Open University: KNOU) to give young people from underprivileged families and adults seeking further education access to secondary and higher education. Distance education was initially conceived in Korea as a new educational avenue for the growing population of secondary school graduates and also, in part, a way of introducing lifelong education to working adults. As seen in many other countries, distance education institutions in Korea, when they were first introduced into the formal education system, were largely considered second choice or lower grade institutions compared to campus-based institutions.

In the 1980s, the focus was on improving the quality of education. Top priorities were the development of students' personalities, the reform of civil education and an emphasis on science and lifelong education. The government launched the exclusive Educational Broadcasting System (EBS), a national computer education center, and instituted an education tax policy to secure financial resources for school investment. Successes included reforms aimed at developing high-level human resources in science and technology, a drastic increase in educational investment from US$190 million in 1975 (14.4 percent of the government budget) to US$2,077 million in 1985 (19.9 percent of the government budget), quality improvement in schools, and the pursuit of excellence in higher education (MOE, 1998a).

EBS opened in 1990 as an affiliated organization of the KEDI. EBS now has one broadcast TV channel, two satellite TV channels, and one FM radio frequency. About 50% of EBS's budget is subsidized by the government and the rest depends on other sources. EBS has played a role of providing formal and non-formal distance education programs through its TV and radio channels to students at all levels. EBS has provided programs related to school curricula, foreign language conversation, vocational education, environmental education, and other study fields. It has also provided programs in supplement to lifelong education for adults. Foreign languages, computer and Internet

training, culture, history, teacher training and arts are major areas of these lifelong educational programs.

In the 1990s, Korea focused on the fulfillment of the public need for higher education and lifelong learning, and the effective use of advanced technologies in schools. The government's plans and action strategies for open lifelong education and technology have been developed according to the suggestions made by the Presidential Commission on Education Reform since 1995 (Presidential Commission on Education Reform 1997). The Commission, established in February 1994 and effective until February 1998, defined the goal of the Korean Education System in the 21st century as an 'Edutopia', meaning 'an education welfare state a society of open and lifelong education to allow each and every individual equal and easy access to education at any time and place'.

In 1997, the Commission recommended the establishment of a virtual university which offers information technology (IT) based distance education programs, a national credit bank system and the use of advanced technologies in schools as a possible means of realizing an Edutopia (Jung & Choi, 1998).

2. Establishment of IT Supporting Organizations

The independent Bureau of Educational Information and Technology was established in 1996 to promote the active implementation of the national policy that focuses on the use of information and communication technologies in education and research. The Korea Research and Information Centre (KRIC) and the Korea Multimedia Education Centre (KMEC) were founded in 1997 to support the recommendations of the Presidential Commission on Education Reform.

Using government funds, KRIC provided information services for professionals in higher education with its own server and network system. Online journal articles, research papers, academic databases and other academic materials are provided to professors and researchers in Korea. Membership is required, but no individual payment is required for the use of KRIC's services.

KMEC supported the implementation of virtual education in primary and secondary schools and provided online teacher training. Using government funds, KMEC conducted various activities such as research into the current use of technology in schools, implementing technology initiatives in schools, developing online learning materials for teachers, students and parents, supporting schools in creating their homepages, and providing a comprehensive educational Internet service called EduNet.

Since its establishment, KMEC had developed 14 electronic textbooks with supportive information databases, educational programs that integrate multimedia materials, CAI(Computer-Assisted Instruction) programs for primary and secondary schools, training materials and research database for teachers, an educational multimedia programming tool, lifelong education programs for the public and parents, and cyber education counseling system (KMEC 1998a). In April 1999, KRIC and KMEC were united to become the Korea Education and Research Information Service (KERIS).

3. Recent Initiatives in Use of IT for Distance Education

3.1 Virtual University Trial Project

3.1.1 Background

With the government's support and funding, all formal higher education institutions are now connected to the education and research network and have computer laboratories. Many digital libraries have been established and linked. In 1998, the government initiated the Virtual University Trial Project (VUTP) under which 25% of higher education institutions in Korea and several private companies have used advanced technologies to deliver distance education to university students and working adults.

3.1.2 Objectives

The VUTP has aimed to explore ways to: 1) create a cost-effective virtual education system without the quality diminishing; 2) develop and implement Web-based or other types of distance education courses; 3) identify appropriate policies and standards for running a virtual university; and 4) share experiences during the trial period to February 2000.

3.1.3 Implementation

Sixty-five universities and five companies have participated in the VUTP; eight conventional universities participated independently without forming a consortium, and 57 universities and five companies have formed seven consortia. Each of the eight campus-based universities has established a virtual campus within its own university system, and each of the seven consortia has established a virtual institution outside of its member organizations. The government encouraged both partnerships among universities and the private sector, and the sharing of existing resources in providing distance education to university students and adults. The VUTP has inspired about 25% of formal higher education institutions and five private companies in Korea to collaborate in providing virtual courses using advanced technologies and to explore the possibility of incorporating distance education into the campus-based system and even to establish a distance teaching university using new modes of technology in the near future (Jung, 1999).

All the institutions involved in the VUTP have taken on the task to expand distance education throughout the country using interactive technologies. The VUTP has stimulated new experiments with various advanced technologies such as satellite broadcasting, videoconferencing, video-on-demand, the Internet and the intranet in delivering distance education. Issues of quality of distance education have been raised and explored. It is expected that the VUTP will help integrate distance education more firmly into the formal higher education system and upgrade the status of distance education.

3.1.4 Outcomes and Policy Changes

The Virtual University Trial Project has increased collaboration among colleges, universities and companies (Jung, 2000). Despite their lack of prior experience in such collaboration, many of these institutions have developed highly successful virtual programs and have entered into formal relationships with foreign virtual universities. In addition, several evaluation studies conducted by Project participants showed that overall, students were satisfied with the flexibility offered by virtual courses.

VUTP contributed to the encouragement of various partnerships and alliances among universities and business. Partnerships reduce the burden to single providers by distributing costs across partners. By forming appropriate partnerships with business, universities which participated in VUTP were able to diminish their investment risks. The Korean government encouraged such partnerships by

instituting policies that provided incentives for private participation and investment in virtual education programs.

Until recently, Korea had only one distance teaching university, the Korea National Open University. But as a result of VUTP, the Lifelong Education Law was amended to accept IT-based private, accredited distance teaching universities as a formal higher education institution. In 2001, nine private degree-granting virtual universities using IT were established based on this revised Lifelong Education Law in Korea.

3.2 Virtual In-Service Teacher Training

3.2.1 Background

As a result of the exponential growth in information and communication technology, many new forms of educational media have been made available over the years. distance education media mitigate the spatial limitations and time constraints of education, removing the need for the learner to be present at an instructional site at a designated time. This has made distance education more affordable, flexible and effective (Hiltz, 1995). Many training institutions have adopted such new technologies. The following are examples of how distance education has been used in in-service teacher education and corporate training.

Although distance education is not yet widespread in in-service teacher education for the 340,000 teachers in Korea, several teacher training centers in the provinces and other teacher education institutions have been using the PC network as a supplementary tool to distribute learning materials and encourage interaction between trainees and trainers for several years. In addition, with government support, major initiatives in developing Internet-based distance teacher education programs have been launched.

3.2.2 Objectives and Implementation

The 16 Provincial Offices of Education are responsible for providing in-service teacher training programs within their respective provinces. To meet these responsibilities, each Office has operated a Teacher Training Center in cooperation with colleges and universities in nearby provinces. Several teacher training institutions have adopted the PC network and eventually the Internet as a teaching and communication tool alongside conventional training methods.

Nine of the provincial Teacher Training Centers have used the PC network in all 79 general and specialized training courses to distribute course materials, announce important messages, allow participants to interact with others on specific issues, and to encourage interaction between trainers and learners. The network has been used as a supplementary medium to conventional teacher training in most of these online programs. For some courses, the network has been adopted as the main training medium. Teachers can study course materials at home with individualized interaction with instructors.

Distance or online training courses for teachers were not credited by the Provincial Office until the Korea National Open University (KNOU), a sole national distance teaching university, offered a distance teacher training program in 1997. KNOU, with the support of the MOE, created a 60-hour nation-wide distance training program entitled Introducing Open Education in Primary Schools: Why and How?, for primary school teachers using a self-study textbook, Cable TV (CATV), and a two-way videoconferencing system. Until winter 1998, the program was delivered four times and each time about 1,000 primary school teachers,

including some administrators and school principals, took this virtual training course at home. Their performance was assessed by assignments, participation in the videoconferencing and a final examination.

3.2.3 Outcomes and Policy Changes

The course evaluation report of the first term (KNOU 1998c) indicated that more than 70% of participants were in their forties and fifties, 62% were from big cities, 60% were male teachers, 69% of the teachers said that the course was satisfactory overall and 90% indicated that the content was useful for understanding basic concepts and applying open education to classroom activities. In 1999, another distance program with similar topics was delivered to secondary school teachers nation-wide.

KNOU also created a winter vacation distance training program for teachers at all levels with the support of the Korea Philosophy Association. The aim is to improve the teaching of logical and technical writing. This 60-hour program using a self-study textbook and videoconferencing in 12 study centers was delivered three times to about 1,000 teachers at primary and secondary school levels each time. Assessment was based on attendance at the videoconferencing sessions, a mid-term report and a final examination. The completion rate was 90%.

The course evaluation report of the first term indicated that 39% of participants were in their forties, 29% in their fifties, and 23% in their thirties. 70% were male teachers. More than 65% of participants came from big cities. 89% indicated the course was useful in improving their teaching. 78% enjoyed active interaction with instructors via videoconferencing. Integration of the Internet or PC network as a communication medium was suggested by the teachers.

In summer 1997, the MOE and the MIC funded a project to create a Cyber Teacher Training Center (CTTC) (http://edunet.kmec.net) within the KMEC. A software platform for managing virtual teacher training and 11 training courses in the field of general education were developed as a result. With an additional six courses developed in 1998, these virtual courses are now available through the EduNet, an integrated educational service on the Web. The CTTC is managed by the KMEC with assistance from the Provincial Teacher Training Centers and the Korea University of Teacher Education (KUTE).

The Teacher Training Center in each Provincial Office of Education is encouraged to use the virtual teacher training programs developed by the KMEC, to revise them to meet their own purposes, and to offer them to teachers in its province along with conventional face-to-face training. In 1998, one Provincial Office and the KUTE used these virtual programs for teacher training.

Campus-based universities or consortia of the universities participating in the VUTP also offer some online teacher training courses. For example, the Open Cyber University (OCU), Seoul National University and Ewha Women's University offer Web-based training courses for teachers. In addition, several private training institutions begin to offer internet-based teacher training programs in 2001 and it is expected that more universities in the VUTP will offer internet courses for teachers this year.

In winter 1998, teacher training materials were digitized by KMEC. As a result, teachers in each province could access these training materials via the EduNet or commercial PC network, search the materials according to training institution, content, instructor, year of publication and type of training, and download them for home study. These online materials

can be used for individual study in conjunction with face-to-face courses, or as learning resources for online teacher training courses offered by educational institutions. Since all teachers are encouraged to have an EduNet ID, online materials on the EduNet will be actively used by individual teachers as well as by teacher training institutions.

Beginning 1998, individual teachers' autonomy in selecting their own training courses based on personal needs has increased. It is anticipated that more teachers will choose online courses over traditional face-to-face, group-based courses. To meet demand for online training of teachers, many teacher training institutions including the Teacher Training Centers in 16 provinces, KMEC, KUTE and other universities are preparing Web-based in-service teacher training courses.

3.3 Internet-Based Corporate Training

3.3.1 Background

Since the mid 1990s, many companies in Korea have begun to explore the use of networked training strategies such as Web-based training as an alternative to regular training classes. According to the report by the Korea Society for Corporate Education, more than 70% of 500 big companies have adopted ICT for training. About 20% have used computer networks such as PC network, Internet or Intranet, as a main delivery mode or as a supplementary communication tool for training.

3.3.2 Implementation in Sample Cases

The Human Resources Development Centre (HRDC) in Samsung Group formed a Distance Education Team (DET) and after establishing a HRDC Web Server in 1994, started developing virtual courses. In 1998, Samsung's Cybercampus provided virtual training courses in a more integrated form through a total of 28 online courses. In 1999, it became a for-profit training center called CREDU and over 100 online courses were provided to employees of all Group companies and other companies and K-12 teachers. The courses provided by the CREDU cover the areas of basic and advanced job-related skills acquisition, management, English and Samsung Induction programs for foreigners. These Web-based virtual training courses are planned, designed, managed and evaluated by the professional instructional design team using the Network-ISD model. Distance Learning Support System software is used to manage the virtual training programs and each student's progress.

In July 1998, the LG Group, one of the largest enterprises in Korea, opened the LG Cyber Academy within the LG HRDC. This Cyber Academy aims to provide just-in-time, on-demand, Web-based training programs within its Intranet system to LG employees who, for whatever reason, cannot attend face-to-face training sessions. A total 757 employees enrolled in one of the five Web-based training courses during 1998. Five steps in a conventional ISD model are applied in course development: needs assessment, design, development, implementation and evaluation.

A typical virtual training course consists of learning content on the Web, small group interaction among learners, Q&A between learners and online instructors, and relevant information library. Each employee's learning progress is managed and monitored by the Cyber Academy platform system.

Unlike big companies, most small and medium-sized enterprises (SME) do not have in-house training centers. To meet their

employees' training needs, they have use outside training institutes, both private and government-supported. Since the mid-1990s, many such institutes have begun introducing distance education including online training. The recent financial crisis increased the need for virtual training because of cutbacks in training budgets and increased responsibilities of employees.

Sungjin Information Technology Systems, a training institute providing training courses to SMEs in Korea, has begun to provide Intranet-based training courses to respond to new training needs in the market. In September 1998, Sungjin ITS developed two virtual programs, each consisting of three modules: one for teaching skills to use IT for performance improvement and the others for teaching strategies to economize production and management systems. Two thousand employees from different companies are now taking these virtual training programs.

Sungjin ITS is now preparing an Internet broadcasting training program, which teaches Korean to Koreans who live outside the country. They collaborate with the Arirang International TV Broadcasting System. A Web-based training course on the use of IT has been developed for public officers in the Seoul City Hall. Sungjin ITS has also been asked to develop Intranet-based training courses for the Ministry of Defense. Based on feedback, Sungjin ITS will revise existing virtual programs by applying instructional and motivational design strategies and adding face-to-face components to its learning environments.

Besides these organizations, the Korea Banking Association has set up a Cyber Banking School to provide virtual training courses for its member institutions. Korea Telecom and Posco Company have used the Web and desktop videoconferencing to deliver training courses. Samsung Data System has been implementing virtual training programs for its employees since the mid-1990s.

3.3.3 Outcomes and Policy Changes

It is expected that more companies will adopt distance education methods in training to reduce training costs in the long run. Previously, training by private companies was not given formal recognition or credit, since higher education was understood as the sole domain of the formal school system. Such a belief placed inordinate demands on the university system and created excessive competition among students. Moreover, the value and power of non-formal education was greatly underestimated. The Presidential Commission on Education Reform, in May 1995, proposed the introduction of Credit Bank System as a concrete way to recognize private sector's educational services as a formal higher education. The Credit Bank System guarantees each learner's right to access learning, any time and any place, through a variety of methods, means and media. It also assists in the realization of a lifelong learning society by recognizing individuals' diverse prior learning experience received through either formal or non-formal educational institutes.

4. Implications for Policy and Future Directions

Recent developments in distance education in Korea show that more and more higher education institutions, including colleges, universities and professional training centers, will adopt IT and communication technology in education and training to implement distance education programs. With the expansion of distance education programs

nation-wide, issues of quality will be more seriously discussed and pedagogical models for distance education will be sought. In addition, ways of reducing cost of distance education using advanced technologies without a decline in quality will be explored. Allowing more flexibility and openness in distance education will be key issues for distance educators and policy-makers. The Korean experience suggests several major implications for policy and future directions in the successful implementation of distance education for higher education and training.

It is being said that distance education, through IT and communication technologies, has changed the nature of learning. Greater and more timely access to information has been achieved and wider cooperation in knowledge-building among people has become possible. We see a paradigm shift from distance teaching to distributed learning. Distance teaching organizations using broadcasting media and print materials cannot afford to ignore the tremendous potential of interactive technologies such as the Internet.

More and more distance teaching institutions are now integrating interactive technology into their activities. But it has to be emphasized that interactive technologies such as the Internet can provide a real and timely services to distance learners only if quality and effectiveness outweigh the costs.

4.1 Adopting Systems Approach in Instructional Design

The experience of Korea confirms that introducing advanced technologies or hiring famous content experts to deliver virtual courses does not necessarily guarantee the quality of educational services. Rather, the need and the means must be analyzed, an optimal solution must be sought, the solution must be implemented, and the results must be evaluated and fed back into the design.

Adoption of an Instructional Systems Design (ISD) model helps distance educators to take a step-by-step approach in developing and implementing effective open and distance courses. In applying the ISD model, pedagogical features of advanced technologies are identified, and teaching strategies are carefully selected based on these features. Content experts or famous scholars in certain subjects may provide professional support to instructional designers to develop and implement high-quality courses that satisfy learner needs and employ optimal open and distance teaching strategies.

4.2 Establishing a Regular Quality Management System

A regular system to monitor and evaluate the development and implementation of distance education will be required to ensure the quality of the educational services. This requires major investments in building research capacity in distance education institutions. Quality management systems through continuous monitoring and evaluation will help identify problems in academic programs and support services and suggest possible solutions. In particular, feedback from students must be sought and used to revise programs and improve services. Also, regular examination by external experts needs to be conducted to identify problems in organization, policies and operations. This external evaluation will help distance education institutions compare their performance with campus-based institutions.

4.3 Requiring Organized Training Programs

Korea's experience tells us that the successful completion of a distance education

program requires each learner to have good self-directing learning skills and well-organized learning support from the institution. Organized sessions to facilitate self-directed learning are necessary to help learners develop and strengthen competencies in managing the independent learning process at the very beginning of their study.

Staff development is very important to successfully implement distance education. Continuous staff development programs that emphasize educational effectiveness, design and interaction strategies of courses, and technical skills need to be integrated into the distance education system in order to improve the educational quality. Online technologies have important promise in providing staff development programs.

4.4 Implementing Cost Reduction Policies

Institutional partnerships are important for distance education providers in that they reduce the cost of introducing new technologies and also improve the quality of developing programs. By forming appropriate partnerships with campus-based universities, open and distance teaching universities can secure external content experts and teaching support. Partnerships with business sectors may help reduce investment costs in hardware systems such as a computer network, recruit students and obtain advanced technical skills. Open and distance teaching universities that wish to commercialize their educational programs and research must from the outset consider forming partnerships with business. Finding creative ways to share resources will be the key issue in forming partnerships with other organizations.

Open and distance teaching universities also need to find ways of reducing the cost per graduate by improving the graduation rate. Several cases show that per student costs in distance teaching universities were lower than in campus-based universities (Perraton 1994). Yet per graduate costs were not necessarily lower because of the lower graduation rate in distance teaching universities. The experience of the UK Open University shows that individualized tutoring services help increase graduation or completion rates. Unfortunately, tutoring costs are too high for many distance teaching universities with large numbers of students. Therefore, other ways of helping students complete their study need to be sought. Combining tutor support with computer-mediated support, encouraging voluntary study activities among students by providing incentives, and using outside volunteers as tutors can be considered as alternatives to current fully human-based tutoring services.

4.5 Implementing Open Policies

A distance teaching organization is not necessarily an open system. KNOU shows that even if KNOU accepts working adults as students once they have high school graduation certificates regardless of their age, KNOU has not been open in its curriculum. To be distance education institutions, open policies towards access, curriculum, methods and learning processes have be institutionalized.

In addition, providing the appropriate legal foundation is necessary for promoting virtual education in various fields such as in-service teacher training and corporate training. Learning from its prior experiences in in-service virtual teacher training, the government should provide legal incentives and policies for teacher training institutions to restructure their programs to include open and distance teaching as future initiatives.

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