1. Knowledge-Information Society and Changes in School Education

The 21st century is a knowledge-information society. In this society, unlike in the industrial society based on material production, information and knowledge play a central role in social activity, which calls for new values and views on life. As such, education must predict social changes and cultivate talented human resources for the new society. It is time to make an effort to break with the old educational paradigm focusing on standardization and knowledge delivery and to create a new paradigm that emphasizes diversity and autonomous learning. As Professor John Kenneth Galbraith said, future society will also be an age of uncertainty in which most changes will occur in a way that cannot be imagined. This in particular means that elementary and secondary school students who are going to live in such an unpredictable society must be equipped with the ability not only to cope with the various problems they will face but also to lead social changes. In addition, as a society becomes more pluralistic there will be more problems that individuals cannot deal with by themselves and it will be essential to develop the ability to effectively communicate and cooperate with others and solve problems together. In order to resolve the current educational problems and meet new demands arising from social changes, it is necessary to transform not only school education but also the whole existing educational system. In such circumstances, e-Learning has emerged as a learning tool that can satisfy the demands of learners at any time and any place by expanding education opportunities using information and communications technology (ICT), and thus is expected to have a great effect on elementary and secondary education, higher education, and career and lifelong education. e-Learning has brought about changes in school education by making schools improve the learning environment by installing the necessary infrastructure and developing new teaching and learning materials for diverse learning activities. e-Learning also calls for new teaching and learning methods since it expands fields of teaching and learning between teachers and students from the classroom to cyber-space. This expansion has provided learners with a place of education that they can access at any time and any place to meet their needs, creating a new educational paradigm. In the knowledge-information society, the concept of education has been changing from teachers' instruction to self-directed learning. In other words, in the past teachers conveyed the accumulated knowledge to students in school, but today education has changed so that students seek for the opportunities of self-directed learning on their own at any time and any place. Because this method of education enables learners to actively seek learning, it is important for them to develop their own abilities and aptitudes. The conventional and passive one-way education must be changed to self-directed and interactive education. The knowledge needed in the knowledge-information society is living knowledge that can be used as different purposes. Such living knowledge is created by individual's creativity and capability to learn on their own.

2. Launch of e-Learning Initiative and Its Development

With the successful implementation of the 'Adapting ICT into Education Master Plan' by the Ministry of Education and Human Resources Development (1st phase: 1997-2000, 2nd phase: 2001-2005), most schools have established the physical infrastructure for e-Learning. The Internet can be accessed in every classroom and a computer is assigned to every teacher. Much educational software has also been developed and distributed. Through the project for the 'ICT Adapted Education Promotion Plan' in 2001, metropolitan and provincial offices of education, e-Learning pilot schools and other schools took part in making school homepage and developing teaching software and ICT teaching curriculums. The materials developed have been used for learning activities and shared among schools nationwide through the 'Educational Resource Sharing System' that was carried out in May 2002. e-Learning is a cyber educational system that enables individuals to receive customized education to suit their own level of learning. Using the 'EBS E-Learning Project' for the National Scholastic Aptitude Test for University Entrance (NSATUE), 2004 NSATUE as momentum, the e-Learning initiative has presented five goals and ten tasks as means to create a learning and cultural community that connects schools, homes and local communities. The goals and tasks are as follows. The initiative is to provide high-quality educational contents in order to make classroom lessons interesting and rewarding and support teachers in enhancing their
professionalism; to provide a variety of self-study contents in order to promote student-oriented educational activities and encourage interactive learning; to consolidate ties between schools, homes, local communities and lifelong education institutions in order to form a learning and cultural community and expand educational opportunities for the disadvantaged; to lay the foundation for successful operation of the system in terms of infrastructure, overhauling the e-Learning operating system and establishing infrastructure for an effective e-Learning system; and in cultural and institutional terms, to overhaul the regulations and raise public awareness through promotional activities. The e-Learning initiative focuses on developing contents that enable learners to study on their own and supporting learning activities, including providing advice on the curriculum, career path, and performance. The initiative was first tested in September 2004 when the Cyber Home Learning System that was launched in three regional offices of education-Daegu, Gwangju, and Gyeongsangbuk-do. Based on the pilot projects in the three offices of education, the system will be improved and extended to other 13 offices of education. For teachers, the Center for Teaching and Learning will systematically organize educational contents that have been developed so far so that teachers can use them easily. In addition, professional consultation will be provided to help teachers plan classroom lessons and develop teaching strategies. Materials for different levels, elective subjects, and vocational school students will be upgraded and materials necessary to develop character and creativity will be developed. The e-Learning initiative is also expected to improve public education by expanding training opportunities for teachers to enhance their capabilities and encouraging project-oriented learning and discussion-based learning both online and offline. It aims to increase cooperation with lifelong education institutions so that not only schools but also local communities can be involved in education. It also aims to contribute to education welfare by increasing support for the disadvantaged who suffer from the digital divide caused by economic and regional disparities. The mid- and long-term roadmap plans with the start of e-Learning era in 2004, expansion period until 2006 and the successful achievement of 5 goals and 10 tasks by 2008, will ensure the foundation for another leaping progress. This plan aims to foster talents with active learning ability, enhanced character and creativity, to strengthen national /competitiveness and improve individuals’ quality of life, and to realize education welfare by increasing learning opportunities and experiences.

3. Effects of e-Learning on School Education and Promotion. In this section, the effects of the e-Learning policy on school education and ways to promote e-Learning will be discussed.

1) As the cyber learning system expands, it will be combined with public education system or used as a supplementary learning tool to bring about changes in the existing public education system.

Improvement of educational curriculums based on e-Learning is expected to greatly change school education. In a knowledge society, it will be difficult for the current school system and curriculum to provide all students' wants and needs, and thus a new form of education is sought to combine the conventional offline education and the emerging online education in a complementary way. For example, universities have opened cyber universities and provided online lectures in some courses. There are also scores of private web-sites that provide educational courses online. Because the offline education system has limitations and students' demands are diversified according to their levels, online and offline education will complement each other to satisfy students' demands and fit the market principle of competition. Online education will first serve as an auxiliary tool for the learning activities of schools, and gradually develop as a supplementary tool to be used in areas with insufficient or no support under the current education system, and later even in effective areas. It will be particularly effective in areas such as foreign languages, technology and art education. Under the e-Learning system, current textbooks will lose significance, and, in fact, they have already started to lose their role as a medium for conveying knowledge. New textbooks with a totally different concept will be created to meet demands of and provide a wide range of choices for learners of different levels.

2) The e-Learning system will call for a variety of specialized contents that learners of different levels can choose for themselves.

The current 7th national curriculum aims to educate students to become people who are creative and able to forge their own paths in life, and who can create new values and contribute to developing local communities. In other words, the current curriculum focuses on cultivating learners’ creativity by enabling them to take the
initiative in their own study according to their own levels. The existing educational system, however, is not large enough to respond to learners' demands in the future knowledge-information society, where a variety of contents will be provided for learners to choose from. Those contents should meet learners' demands, reflect learners' different levels, and help learners achieve their goals, and online educational sites will be organized to provide specialized contents. Some educational sites already provide services such as distance lectures, certificate acquirement, and test preparation, but they have limitations due to a lack of courses, course suitability, connection to other courses, and social recognition after completing courses.

3) The e-Learning system should encourage activity-centered learning, not the simple memorization of knowledge.

In the knowledge-information society, it is not the ability to simply memorize knowledge through repetition, but the ability to analyze problems and come up with creative solutions. In this sense, the 7th national curriculum uses ICT not only as a tool for searching and memorizing knowledge but also as a medium for studying each subject. In the case of elementary school education, it pursues the integration of all subjects and learning that emphasizes not memorization but experience, discussion and participation. It also places priority on exchanges and communication between teachers and students. It departs from the current practice where teachers simply convey knowledge to students, and promotes learning through teacher-student interaction. All this will require various learning contents such as cooperative learning, discussion-based learning, project-oriented learning, and statistics-processing learning. One of examples for these learning is taking place through online communities involving teachers and learners. Although those communities currently serve only as social clubs, they should be developed into groups that collect, organize and even produce educational contents. School homepages or educational institutes will naturally be used, leading to the formation of a learning and cultural community. This naturally-formed community will be the very learning organization that the future society needs. Although the role of school homepages yet remains at introducing and promoting schools, they will gradually have to serve as a cyber space, along with online communities, where knowledge is gathered, accumulated, managed and exchanged. Thus, it is important to support school homepages and cyber communities in order to exchange and share various learning activities in cyber space, encourage other learners' participation and use all participants' experience, knowledge, and learning activities as key sources of learning in the knowledge-information society.

4) It is necessary to devise ways to standardize all kinds of educational contents and strengthen ways to design e-learning.

Educational contents are the most basic materials provided to promote the e-Learning initiative. Educational contents refer to teaching and learning materials that are essential to improve the methods and effectiveness of education. So far, those contents have been developed in unorganized ways due to lack of adequate standardization, failure to establish operating platforms, and jumbling of application technologies. This has caused problems not only for learners but also for content developers and providers, and made even quality materials impossible to share because of incompatibility. Companies are developing educational contents in their own way using IT technology and learning theories, but because there are no standards for designing and developing truly essential contents they are in fact busy dealing with problems as they run into them. Thus, it is urgent to develop standards for educational contents for teaching and learning in cooperation with organizations for standards and specifications and other related institutions. It is also important to seek ways to institutionalize those developed standards as national standards and encourage their use. Among such standards are teaching and learning contents development methodology, design and production guidelines (eg Sharable Content Object Reference Model [SCORM]), material classification criteria, metadata attribute definitions, and Learning Management System (LMS)/ Learning Content Management System (LCMS) technology standardization. Newly developed standards should be observed by content providers such as public organizations and private companies, and teachers, who are both content users and providers, should be allowed to re-upload contents after using them. Moreover, those standards should continuously be improved by strengthening support from the private, public, industrial and academic sectors. When producing educational contents based on the standards, contents providers should overcome dependence on technologies and increase the use of teaching and learning theories so that they can produce contents that take into account the learners' convenience, interactivity,
levels, and multimedia availability. Such contents should also be entertaining to suit the new generation. This is important because 'Edutainment' contents help learners to continue learning, increase curiosity, strengthen concentration ability, and attain goals. Edutainment contents also change the teaching and learning method from didactic, cramming, and one-way to being user-oriented so that it can encourage learners to take the initiative in their studies. This is where the significance of Edutainment lies.

5) The government should come up with measures to share developed educational contents and overhaul necessary regulations, including those on copyright.

The MOE&HRD, MPOEs, schools and other related public agencies have each developed and distributed educational contents. Cooperation between these organizations in developing contents, however, is still weak and each provides contents in its own way. This makes it hard for learners to find the information that suits their need. To deal with these problems and promote production and distribution of contents, the government launched the "Educational Resource Sharing System" in May 2002, in cooperation with the KERIS and 16 MPOEs. The system based on metadata makes it possible to easily search any teaching and learning materials by simply logging into school or educational organization sites. Previous systems gathered information in one place and uploaded it for users, or provided links to sites containing relevant information, but they had limitations resulting from problems related to copyright, internet traffic, information processing and service conditions. Most of these problems can be resolved in the new content sharing system, because the system stores contents where they were produced and collected relevant metadata to transmit them to the central system, and in turn, the central system processes transmitted metadata and re-distributes it. The system will extend the range of content providers beyond educational organizations to gradually include teachers' communities, schools, public organizations, broadcasting companies, newspapers, and publishing companies. In addition, other necessary measures and supporting systems, including copyright laws, should be devised to promote contents sharing.

6) Quality management of e-Learning contents should be strengthened.

Online educational contents are being provided to the public without going through a proper objective quality evaluation process by trusted organizations. Given this, it is necessary to establish a proper system to evaluate the quality of the vast amount of educational contents being produced in order to create an environment where content producers and providers are encouraged to produce high-quality contents that users can have confidence in. A quality evaluation system will help create contents with clear learning objectives that reflect teaching and learning theories and strategies. Individual quality system separately run by KERIS and other educational organizations need to be integrated to establish a national educational content management system, and relevant measures should be implemented. Also, quality management should be extended to non-curriculum courses, whether specialized or general, as well as the current curriculum courses. Such diversified contents will enrich teaching and learning activities.

Last but not least, efforts are needed to improve the e-Learning environment in order to encourage teachers to participate in the e-Learning initiative and to achieve self-development.

It is true that teachers find it difficult to practice e-Learning. It will take time and patience, but it is essential to make consistent efforts to lead teachers to participate in the e-Learning initiative under the participatory government's motto of "participation" and "autonomy." e-Learning calls for a great change in the role of teachers. In-depth research on teaching and learning methods that will be used in the e-Learning system is needed to dispel the fear and anxiety teachers may feel regarding e-Learning. In the e-Learning system, teachers will serve as guides who advise students on learning activities, not as deliverers of knowledge. Teachers, as counselors, will be required to help learners choose what they study, solve problems, and decide their path in life on their own, and as true companions, help them to live as creative social members cooperating with other people through e-Learning activities. The true effectiveness of e-Learning will be realized only when teachers can discover its attractiveness and advantage from gradual and exemplary pilot project of e-Learning in elementary and secondary education.