

E-Education Development in Taiwan
- Building an Internet Learning System for All

Ministry of Education, The Executive Yuan

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I. Background (current status analysis)

In new information era societies, the development of a nation depends on its digital learning environment and its citizens' knowledge and ability to apply information. Currently, schools of all levels have already completed the infrastructure for Internet learning. However, for teachers and students of elementary and junior-high schools to apply Internet resources to teaching and learning, the substance of Internet learning must be reinforced and created. Furthermore, information literacy and Internet application knowledge and ability have already been included and implemented into the capability index of the 9-year joint curricula for elementary and junior-high schools, whereas Internet learning and content development participation in high school and vocational high school students have yet to be improved.

During recent years, the Ministry of Education has joined the efforts of scholars, experts, elementary and junior-high school teachers, the industry, the Social Education Hall, and private parties, to promote the creation of high-quality digital content and the development of website content.

In addition, the recently passed Lifelong Learning Act views "learning via websites" as one of the channels for lifelong learning. In terms of system structure, there are the Tourist Increase Project and the Taiwan Touch Your Heart website by the Tourism Bureau of the Ministry of Transportation and Communications; the National Culture Database project by the Council for Cultural Affairs of the Executive Yuan, which plans to collect, organize, and establish within 6 years a database which can be utilized by our Ministry and the Tourism Bureau, there are also introductory projects by the Council, the Cultural Characteristics for Each Township, the Historical Photography Contest, and the Faces of Culture, concerning Taiwan's culture, history, and art; and related database by the National Central Library. Therefore, we hope to integrate or link the above resources in the future so as to avoid overlapping and inefficient use of resource.

In 1994, the Executive Yuan set up the National Information Infrastructure Project Team, and began the promotion for national information infrastructure. In 1996, Taiwan set a goal to "promote Internet services, and reach 3 million users in 3 years",

By September 1999, Taiwan Academic Network (TANet) connected to 12 regional network centers and 25 county education centers. The content of this plan was focused on increasing the “quantity” of infrastructures, but due to insufficient understanding of social issues, it also resulted in the imbalance of urban and rural resources, and created a digital gap. It is crucial that we integrate the resources of information education (such as teachers, curricula, and funds) and establish an evaluation mechanism, improve the teachers’ ability to apply information technology to teaching and encourage teachers to learn continuously, create friendly learning environments and tailor personal needs, in order to effectively increase the effects of computer and Internet access, increase the motivation and will to learn, and alleviate the issue of digital gaps.

Since 1999, the Research, Development, and Evaluation Commission of the Executive Yuan has launched projects to promote online service in remote areas. With the goal of achieving “computers and access to the Internet for all villages”, 174 Internet connection points were established in remote and outlying islands, and over 6500 village information web pages created. Currently the Commission is also leading the “Bridging the Digital Gap Project”, combining the efforts of the Ministry of Interior, Ministry of Education, Ministry of Economic Affairs, Ministry of Transportation and Communications, Council of Labor Affairs, and Council of Agriculture, they have coordinated and integrated resources in terms of the Internet connection points, computer hardware, education training, web site creation, employment counseling, and developing local industries. They also hope to plan and established an evaluation mechanism to increasing overall efficiency.

The Ministry of Education began promoting the Reinforcing Information Education in Elementary and Junior-High Schools in Remote Areas Project (part of the Knowledge Economics Program) since 2001, and served as the recruiting unit for the Talent Cultivation Group of the NICI group of the Executive Yuan. The Ministry also considers Bridging the Digital Gap one of its priority tasks. The Ministry has actively encouraged the participation of private sectors, for example, subsidized college and high school and vocation high schools students to provide information service to schools in remote counties, and cooperated with Intelligent Digital TeleVision to conduct experimental projects on teaching English via satellite network in remote schools. Now, the Ministry plans to increase the depth and width of implementation, and focus on bridging the digital gap in elementary and junior-high schools.

II. Current Issues and Difficulties

1. Creating digital learning substance involves the acquirement of intellectual property rights, and to look after the rights of the authors while retaining the essentiality and convenience of teaching implementations is not an easy task. Digital copyright issues and handling procedures are still in need of standardization and simplification; therefore specialized, credible organizations are required to provide related services.
2. In the future, after the lifelong learning platform has been established, county governments shall be responsible for tasks such as update and maintenance. However, Some local governments have expressed their difficulties regarding human resources and finance, and require full subsidy from the central government.
3. From technical aspects, implementation units for network authorization, information collection, and resource integration must also be established in advance.
4. Problems of coordination and integration encountered by the government during the current process of bridging the digital gap must be planned and overcome in advance.

III. Key Issues Yet to Overcome

1. Defining the range of digital learning content creation: Content should aim at being refined, detailed, thorough, and educational, and provide the public with related information on a long-term basis. We must try to establish a learning network which is sustainable in term of development, and which is people-centered instead of technology-centered or facility-centered.
2. Providing different levels of information: Provide information of different levels

from different aspects for people of different age groups or needs. An example concerning a cultural site would have the levels of “introduction”, “culture, custom, and life”, “in-depth reports”, and “periodical reports of research papers”.

3. Encouraging high school and vocational high school teachers and students to apply digital learning technology for creative learning and cooperative learning.

4. Unstable network quality in remote areas: Due to factors such as terrain and landform (for example, outlying islands), telecommunications transmissions in some remote areas are unstable, thus affecting the quality of online teaching.

5. Lack of opportunity for digital learning for some people in remote areas: In remote areas, there is less impact from external cultures, in addition to fewer chances of applying information technology in daily life. Therefore, people in these areas often do not feel the need for new technological knowledge.

6. There is urgent need for advanced understanding and planning of the current situation concerning digital gap in urban and rural schools, and of an evaluation index and its formation factors, in order to resolve needs and attain goals.

IV. Specific Strategies or Proposals

1. Draw up a plan to combine with teachers, experts and scholars, the industry, and private sectors (including learning groups, educational groups, associations, foundations, and community groups) to developing Internet learning content, creating teaching materials, technical support services, platform construction and maintenance, assisting schools in remote areas, and other services.

2. Refer to the case in U.K. where post-docs assist the projects of 1000 specialist

schools, and cooperate with alternative compulsive military service personnel with doctoral or master degrees in related fields, to develop Internet learning content and platforms, and promote plans related to bridging the digital gap.

3. Build and apply an open format and adopt a common standard, to encourage resource integration and exchange.

4. Develop Internet learning content for elementary and junior-high schools
 - (1) Work with scholars from colleges and universities, teachers' groups, and industries, to plan and construct 6 major learning nets (including life sciences, nature and ecology, technology education, health and medicine, history and culture, and art and humanity), to provide elementary and junior-high schools students with Internet learning activity substance and Internet supplementary teaching materials.
 - (2) Organize the digital resource (books, cultural artifacts, precious stores, and teaching materials) of the Social Education Hall to develop a digital supplementary teaching materials database for elementary and junior-high schools.
 - (3) Combine with the teaching materials resource centers of county and city education bureaus, and establish Internet learning teaching materials and plans for all fields, in coordination with the 9-year joint curricula for elementary and junior-high schools.
 - (4) Combine with learning groups which have common interests, and assist in the sustainable management of learning websites, and conduct courses on the Establishment and Maintenance of Internet Groups, to reinforce the maintenance of Human Learning Groups in addition to increasing technological skills.
 - (5) Combine with the research and develop achievements of the Council for Cultural Affairs and the National Science Council, and the digital substance of the national digital reserves project and the digital learning national science and technology project, and convert them into learning substance appropriate for elementary and junior-high schools, to enrich the digital learning content of elementary and junior-high schools.
 - (6) Combine with the Information Education Infrastructure Project to enhance digital

learning content application among current teachers, and to train those teachers who are interested to develop the ability to create digital teaching materials.

(7) Combine with private groups to launch website content grading and competition activities for public reference.

(8) Establish Internet learning patterns and promote demonstration sites.

(9) Strengthen the digital content application and creation ability in teachers of all disciplines, promote the organization of teachers' workshops of all fields, and combine information teachers and information groups to conduct cooperative learning within the same field.

(10) Reinforce students' concepts of Internet ethics, cultivate correct learning dispositions of using the Internet, and take notice of negative effects of the Internet on students (such as abnormal Internet relationships)

5. Guide high school and vocational high school students to participate in the development and application of Internet learning content.

(1) Use the 6 major learning nets to encourage students to record their learning process, share what they have learned, and conduct cooperative learning and creation through the Internet.

(2) Encourage colleges and universities, and high schools and vocational high schools to establish information clubs and participate in the development and application of Internet learning content. Enhance learning among students' clubs, learning groups, and other organizations, to accustom students to the usage of high quality digital content.

(3) Apply information technology tools to develop Internet learning materials for all disciplines. For example, students can use the collecting, analyzing, charting functions in the geographic information system collectively to enrich the Internet learning substance of geography.

(4) Combine with high school and vocational high school communities programs and develop Internet learning courses through local cooperation, to provide students in the

area with online learning opportunities which will broaden their views of learning and integrate community learning resource.

(5) Launch the CyberFair and thematic internet content creation contests to encourage high school and vocational high school students to participate in creating Internet learning substance.

(6) Provide incentives to encourage students to develop Internet substance with local features, which can enhance Internet substance creation experience for students, and improve their knowledge of professional skills. For example, the process of making Yinko ceramics, introduction to Sanyi wood carving, and so on.

(7) Encourage social and educational organizations to launch activities for high school and vocational high schools students, such as Internet science exhibitions and Internet humanity and art exhibitions, to encourage students to participate in developing online learning substance.

6. Inspect current condition of digital gaps and devise resolutions

(1) Review the standards for digital environments or digital learning and the definition and range for digital gaps, and set up an efficiency index to serve as the basis of assessing digital gaps.

(2) Actively promote the advantages of digital learning and information application in everyday life, and create friendly learning environments to suite personal needs, in order to effectively increase the effects of computer and Internet access, and increase the motivation and will to learn.

(3) Transfer abundant information resource to geographically restricted areas for utilization in a more resilient and flexible fashion, such as local area network (and not necessarily the Internet).

(4) Combine schools, clubs, and student volunteers in cities, metropolises, and local areas to provide community service, appealing to the everyday aspect of information, so that everyone can understand the ease of obtaining and applying information, thus stimulate the will and motive to learn.

(5) Establish a central commanding unit or normal active organization (group) to integrate related resource and establish a sustainable proceeding mechanism. Increase information application ability and lower the gap between information utilization abilities through educational training, and further create demand and induce spontaneous changes to transform into a digital opportunity.

7. Specific measures for improvements to bridging the digital gap

(1) Enrich Internet learning content, and integrate information education software and teaching materials resource, provide rich Internet teaching materials for teachers to use in teachings and for students to use for supplementary learning, thus successfully sharing resource, and decreasing the difference between urban and rural areas.

(2) Enhance the information capacity training of elementary and junior-high schools teachers to increase their information application ability. It is also important to increase the learning opportunities for teachers in schools located in remote areas, to draw up plans to provide information training for teachers in outlying islands through methods of distance learning, and increase the information skills and capacities of teachers in remote areas.

(3) Subsidize Internet connection telecommunications fee and software/hardware maintenance funds for schools in remote areas, and make plans to subsidize teachers and students who purchase computer software/hardware equipment, to encourage learning and utilization.

(4) Set up principles for subsidizing and rewarding public and private high schools and vocational high schools for the improvement operations related to information teaching, in order to promote and improve computer and Internet application environments.

(5) Encourage colleges, universities, and private groups to assist remote areas in promoting information education, in order to accelerate the speed of bridging the digital gap between urban and rural areas.

(6) Increase the subsidy for information teaching materials for schools for the mentally or physically disabled and minority groups, and increase training for teachers and students in these schools, in order to improve information application and learning abilities.

(7) Devise learner and student information ability indexes to serve as the criteria for balanced improvement and development of learning opportunities and quality.

8. The 3 levels of the lifelong learning Internet platform is centered around “learning”, and the database is established on the basis of “providing stratified information”.

(1) Tour entrance: Electronic maps and travel plans

(2) Introduction to culture, education, ecology, landscape, and religion

(3) In-depth information, includes the integration of the National Culture Database and the existing database of the National Library.

V. Plans and Visions

1. Provide detailed educational learning substance and in-depth information that is whole, systematic, rich, and related to the aspects of life in accordance with the implementation of the 9-year joint curricula. Centered on the journey of learning related to life, and categorized according to the different information needed by different age groups, the substance will include learning resource such as nature, humanity, ecology, art, medicine, and health. We hope to enrich our general knowledge of lifelong learning, recreation, and travel; enhance our understanding and feelings for the history, culture, and industry of our local environment; thus expand our senses and perceptions, develop wider views and greater love for our land.

2. Create a “people-centered” Internet learning environment in which all facilities aim at advancing human qualities such as equality and respect, and establish related measures to provide multi-channel learning spaces and high-quality digital learning content via the Internet, to bridge the digital gap so that every citizen may enjoy the same learning resources and make their own plans for lifelong learning.

3. Create learning substance and establish cooperative learning mechanisms (through

sharing, discussing, and improving) within organizations (such as learning groups, teachers' workshops, and student information clubs) to promote humanity and creativity, thus improving Taiwan's overall competitiveness.

VII. Estimated Results

1. Integration of resources from all fields, establishment of rich Internet learning content for teachers and students in elementary and junior-high schools. Teaching materials and learning activities on the Internet can be shared, discussed, and improved. Implement cooperative creation and sharing, and the application and development of Internet learning content.
2. Students trained to become accustomed to using information networks for self-initiated learning and cooperative learning. Utilize diversified Internet learning resource and learning methods to improve teaching quality and to make common Internet learning dispositions and positive applications among teachers and students.
3. Increased high school and vocational high school Internet learning content development, creativity, and application ability. The Learning Website provides students with a place to share learning experiences or announce quality creative works. Realize the goal of local cooperation for high school and vocational high school communities, and integrate community educational resource.
4. Build and enrich the overall information teaching facility and environment for schools of all levels, in order to apply information technology to increase learning efficiency and successfully diminish the difference between urban and rural areas. Enhance the ability of elementary and junior-high school teachers to utilize information in the teaching of all disciplines of learning, so that synchronized improvement of teaching models can be possible in remote areas.
5. Provide quality information usage environments for the teachers and students of schools for the mentally or physically disabled and minority groups. Increase information learning opportunities and application ability. Solidify Internet learning

content and establish sharing mechanisms, so that no gaps exist between the learning opportunity of urban areas and that of rural areas.

6. Provide for all citizens an Internet learning resource platform where learning is possible at anywhere, about everything, and with anyone, to enrich our spirit, culture, life, and art, thus elevating the intellectual level of all citizens.

7. Attract visitors from other countries and share knowledge through the establishment of an Internet international network platform. Nurture the love for our country, land, environment, and ecology.

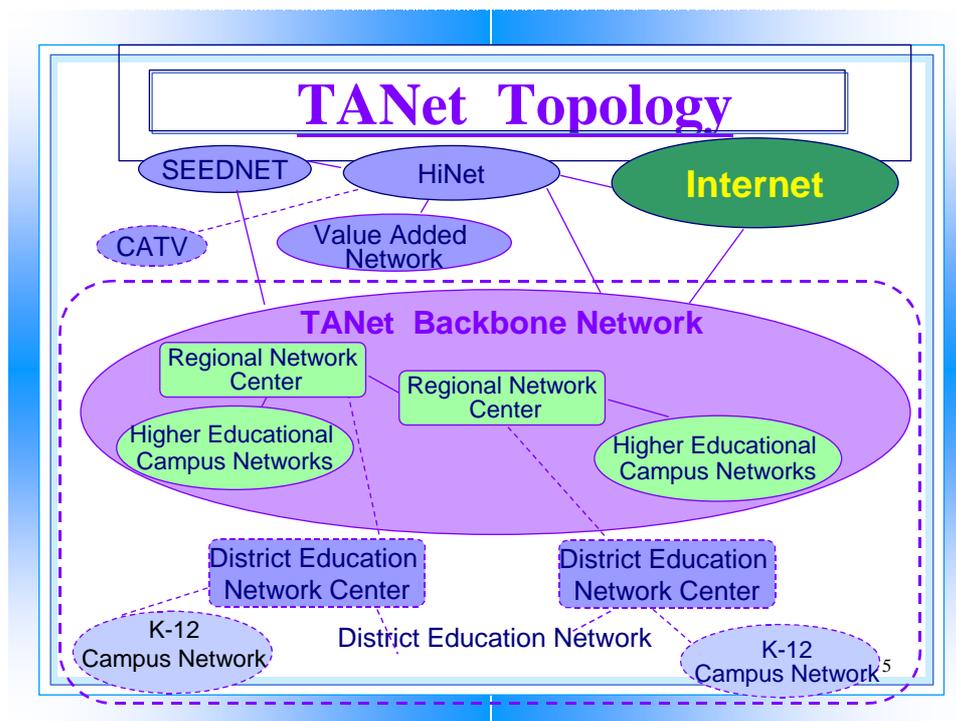
8. Return to the essence and values of life education, to construct digital learning content, broaden our vision, and arouse the enthusiasm and passion for life in teachers and students.

Graphs:

Graph1:TANet Topology

Graph2: Building an Internet Learning System for All

Graph1:TANet Topology



Graph2 : Building an Internet Learning System for All

