

The Distance Learning Program for Vocational Education and Training

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Abstract

Taiwan's economy has undergone a great transformation in the last forty years, from the labor-intensive economy typical of developing countries in the 1960's, to the technology and capital-intensive models characteristic of developed countries; in the process, exports have also made the transition from farming produce to industrial products. There can be no doubt that vocational education, which contributes to the training of technically skilled workers, has played an important role throughout this evolution. At present the government is aggressively promoting "the economic development project", establishing the "Asia-Pacific Operation Center" and applying for membership in the "World Trade Organization (WTO)". In keeping with these goals, vocational education is also beginning to change in line with our country's economic growth. Such changes are absolutely essential in order to keep pace with the development of information technology, and to comply with transitions in the various industries. At the same time, vocational training is gradually accommodating world trends—industrial upgrades, automation, internationalization and so on. In meeting the demands that result from the structural changes of local industries, as well as the urgent need for enhanced manpower training in the service and technology industries (ie. foreign languages, banking, hotels, communications, media, etc.), vocational education is now utilizing modern information technology for the development of Taiwan's human resources.

Few would dispute the fact that the rapid developments in today's information technology has revolutionized the traditional teaching environment. Indeed, the concept of distance learning itself was born from the fusion of information and communication network technology, and it has mirrored the achievements of such technology by providing users with an ever-greater range of learning opportunities. From the point of view of education resources as a whole, therefore, the implementation of distance learning should expand the range of manpower training available through vocational education. Moreover, it should also help balance the educational resources of schools, which will be able to share in the benefits of distance learning.

Since 1995 The Ministry of Education has been planning a pioneer system of distance

learning. This program is part of the 17 priorities of the National Information Infrastructures (or NII). Technical colleges may employ distance learning in students' education and on-the-job training. Furthermore, they can enter into international collaborative work with foreign schools in conducting their distance learning programs, for the purpose of research, exchanges, enrichment of professional skills, and enhancement of competitive power.

I. Background

Our citizens' ability to access all kinds of information will be the key factor in determining our country's future competitive strength, and education is the primary tool with which to upgrade the public's information awareness. The potential of information technology in teaching and training is beyond measure, not least in the way that it will strongly influence the teaching methods adopted by teachers. During the 60's and 70's, for instance, teaching tools were nothing but a piece of chalk and a blackboard eraser; teachers and students met each other face to face inside the classroom during class. In the 80's, videotape programs were used as teaching aids; then in the 90's one-way teaching on the air and by computer arrived, courtesy of satellite transmissions. And it is this development – today's advanced computer and information network technology – which has so revolutionized our teaching methods. It follows that the learning *environment* has also changed. Students may listen to their teacher in a distant classroom through PC's; they can get a simultaneous view of their teachers and texts as well. They may even ask questions and record the "class" for repeated viewing. Companies, in turn, are able to conduct professional training directly through the computer network and employees may flexibly arrange their own schedules. These classes are comparable to a teacher-guided class, and discussions and tests may be conducted as well. Students are even allowed to avail themselves of individual office hours to consult their teachers. The public may also take advantage of this learning facility, in so far as they may take their desired courses and study at any time. This type of teaching method is known, therefore, as "distance learning".

"Distance learning" is an attempt to promote distant learning through the integration of information and telecommunication technology. It not only provides users with more learning options more easily available, but balances the teaching resources of schools. The Ministry of Education shall be initiating massive changes in the available information network of the future NII. In September 1994, the consultant's office of the MOE initiated the program of "installation of the experimental high-speed network". By December, it had started the installation of experimental high-speed network stations in 5 universities; namely, National Taiwan University (NTU), Ching Hua University, Chiao Tung University, Chung Cheng University and Cheng Kung University. In the meantime, the MOE organized some

experts and scholars and formed the Distance Learning Program Committee. Later the Committee conducted "A Study on the Initial Program of the Pioneer Distance Learning System of Taiwan", the resource planning committee serving as the planning staff. The initial plan created 3 experimental distance learning systems; the "instantaneous broadcasting", "virtual classroom" and "course selection". The universities participating in the experiment chose an experimental system that could match their program; facilities were then installed for a two-year testing period. The experiment was aimed at understanding the development and needs for the local distance learning program. Furthermore, it was used to explore and confirm the direction of the program and to provide for the needs of policy-makers. As such, it will serve as the model for the proposed full-scale implementation. During the past two years, the Central and Sun Yat-sen Universities, as well as vocational high schools, participated in the experiment. Chunghwa Telecommunications Co. provided the high-speed experimental network that allowed the above-mentioned establishments to complete their courses and tests for wide-band and narrow-band distance learning education.

II. The Distance Learning Program in Vocational Education in Taiwan

In June 1997, the Executive Yuan approved the "Middle-level Development Program for Distance Learning", for a period of 4 years. The main aim of the program is to provide a basis for the implementation of the distance learning pioneer system, as well as an analysis and survey of its needs. It was based on the long-term goals and strategies of distant learning in Taiwan. During the coming four years, the middle-level distance learning program for vocational education shall seek to achieve the following goals:

1. Attempts will be made at inter-school courses, so that resources can be shared throughout the academic network. Each technical college will also be encouraged to cooperate with well-known foreign colleges, thereby creating a globalized learning environment.

Since the pioneer distance learning system mainly uses the academic network stations, colleges may employ ISDN and other telecommunication channels to establish a high-speed network station that may be effectively linked to other colleges. Each technical college may specialize in its own field, providing its most outstanding course or program so it may serve as an elective course for use by other colleges. It will also undoubtedly be to the advantage of the distance learning courses prepared by universities that they can share limited teaching resources and facilities. In this way, the educational resources of the whole country may be used to benefit the largest

possible number of students. It will also act to bridge the gap between different schools. Through cooperation with international distance learning programs we will be able to introduce the forward-looking technological courses of other countries, or perhaps special courses in the environment of different cultures and languages. The domestic distance learning station shall allow local students to avail themselves of these programs, thereby preparing the students with global insights. Furthermore, each technical college will also adjust to different social needs and initiate programs for life-time education through cable TV, ISDN and satellite networks, or the available resources of Chunghwa Telecommunications.

2. Not only should foreign technology be introduced but distance learning technology should also be brought to all levels of schools through both the implementation of vocational education and the textualization and experimentation of social education.

Promotion of distance learning in vocational and social education will be made possible through Taiwan's widespread and cheap telephone system and cable TV network. The program will seek to speed up the achievement of various educational goals, as well as encourage private review schools, publishers, cable TV operators, and information hardware/software entrepreneurs to participate.. Besides, the experiment shall allow the stimulation of new concepts in vocational education, as well as the utilization of diversified learning resources for teaching students according to their ability. Private entrepreneurs may in turn aid the promotion of the distance learning program, as they develop different types of learning products and services through their involvement and interaction with educational groups.

3. Training programs in distance learning should be employed to help teachers and employees in corporations and government.

In Taiwan, the urgent demand for distance learning is greatest among employees in both the government and private sectors. In the past, only college graduates were considered capable of receiving a complete education. However, Taiwan's gradual evolution into a sophisticated society has entailed the emergence of new technology and new concepts. The employed population, busy with their jobs, do not have the time to get this new information; as a result, they are likely to become more and more isolated from the information revolution around them. To improve this situation, a new learning environment is necessary. People may now study in their offices or homes. Proper measures taken in motivating them are also necessary, so as to foster the self-learning enthusiasm of the employed, in the hope of upgrading national competitive power.

There are over 80 vocational colleges and 200 vocational schools in the country. It is expected that, in the future, these establishments will provide distance learning facilities to teachers, corporation and government employees. In this way, sharing the teaching resources of each school and upgrading teaching quality will be made possible. This program will also allow colleges and social establishments to consolidate their distance learning resources and provide on-the-job training and classes to employees. No doubt these types of classes can reduce the schools' operating expenses.

4. Professionals should be trained for planning, teaching, editing content material and engineering with a view to distance learning.

To meet the massive requirement of distance learning technology and facilities in the future, it is imperative that professionals in the field be thoroughly trained. By professional development, we mean teacher training, focusing on the localization of imported training courses and the development of related training programs. This will surely allow each vocational learning institute to acquire the professionals they need, and to establish their fields of specialty in distance learning, thus increasing the incentive for teachers' participation.

5. In coordination with The TANet secondary and elementary school programs, textbook materials and other learning resources are encouraged to be webbed on the page, in order to provide students with a diversified learning environment.

The program of "TANet to secondary and elementary school" has been implemented by the Computer Center (MOE) and is expected to reach over 100% of schools (including vocational schools) in the country by 1999. Students will become quickly acclimatized to the Internet environment. The distance learning program of the MOE has taken into consideration the progress in the NII development and the implementation of experimental programs in schools at all levels. In addition to conducting studies on the application of the pioneer ATM technology and facilities, the intention is also to keep a closer watch over the application and promotion aspects of distance learning. MOE shall also keep an eye on the developmental learning activities found on the Internet, as well as coordinating with the ISDN network installation schedule of the Telecommunications Bureau. The technology of video conferencing shall be applied to enhance distance learning services. Should such technology eventually be able to make use of Taiwan's widespread cable TV network, then the promotion of distance learning would of course be substantially accelerated.

III. Distance Learning Promotion

Although distance learning is first being implemented in colleges, the MOE shall also initiate planning for the promotion of distance learning in both regular and special, vocational education, in social education, and other further study programs. With regard to the concepts for the aforementioned programs, we shall be inviting experts and scholars to assist the MOE in choosing focal points and schools likely to have a high participation rate, since they shall serve as the sites of the experimental distance learning programs. In time, the number of participating schools will increase. From the experimental setup we will establish the teaching patterns, teaching management, course planning, textbook development, and other characteristics of the distance learning system. Similarly, we intend to actively develop elementary, vocational, social education and even special education materials. We are obliged to train the teachers, to ensure that distance learning technology and experience permeate all levels of education.

In October 1996, it was felt the promotion had reached maturity. "Distance Learning" has consequently been passed to the Computer Center (MOE) for implementation. As the Computer Center's budget for the program has not yet been approved by the Executive Yuan, schools that participated in the experimental program sought the participation of neighboring private universities and colleges. Since interest in the program was quite high, a total of 30 colleges signed up to join the experimental program during the second semester of 1996, including 16 regular universities and teacher's colleges and 14 technical institutes. 22 courses were offered, including Marine Geology of the Taiwan area. To give just one example of the program's potential: There were 5 medical colleges that joined the distance learning program, offering general medical courses such as Health & Sanitation. Distance medical education training and distant medical services were implemented by the NTU College of Medicine, the Chin Shan Medical Training Centre, and Cheng Chih University College of Medicine for the outer island district of Penghu. Students were taught diagnostics, clinical cases and group treatment through distance learning. The programs improve the quality of medical treatment for the community.

In light of its obvious utility, the Ministry of Education firmly hopes that it will be able to integrate the experiences, faculty, equipment, text books, application software and other resources of different schools within a short period of time. We hope to put the schools' resources to fuller use toward the goal of "resource sharing", as well as to diminish the gap between private and public colleges, thereby breaking the student's fixation with famous teachers and universities. In July 1997, the MOE passed the "Pointers for the Experimental

College & Higher Education Distance Learning Courses". Around 71 schools joined the experimental program in the 1997 school year, and at the time of writing over 100 distant learning courses are available to students.

It is hoped that we can gradually give the distance learning program a nationwide exposure. In particular, we hope that the Open University will be able to break away from its current time and space limitations, and thus provide classes of better quality; livelier, more effective teaching; and more convenient and economical services for the benefit of those students who are anxious to continue their studies. Those responsible for the current review of school education may also consider employing this system to solve the perennial problems of overcrowded classrooms and inadequate safety facilities. Students, after all, are entitled to study in a more comfortable and safer environment. Another benefit offered by distance learning is class repetition. Students will be able to repeatedly review course material – thus ensuring a more complete understanding – and thereby hopefully enable them to achieve the objectives they set when taking these supplementary classes.

IV. Application of Distance Learning in Vocational Education and Training.

Distance learning, when applied to vocational education and training, will provide the field with a tremendous boost. The MOE is aggressively preparing an “accelerated highway” in vocational education, the so-called “second national education channel,” to provide vocational education with a necessary fillip. As a matter of fact, the MOE promulgated the "Pointers for the Experimental College & Higher Education Distant Learning Courses" to encourage the participation of technical colleges in experimental distance learning programs. It hopes to integrate the specialties of each college and allow them to present their special vocational courses through the system. The program shall emphasize the skill training aspect of vocational education and teach college general courses through distant learning as well, thereby making up for the general course inadequacy of vocational colleges. Furthermore, the MOE is hoping to promote national symposium programs through distance learning. In this way, technical college students who wish to further their studies will have the opportunity to do so under the guidance of reputed teachers. Clearly then, the program reinforces the resources of technical colleges.

Among the 71 schools that participated in the 1997 school year experimental distance learning program, 34 (48%) were vocational colleges. Moreover, in realization of the life-long learning program, the MOE is proposing a 3rd national educational channel blueprint: *the life-time educational boulevard*. The boulevard shall allow members of society who wish to continue learning to have the chance of going back to school or availing themselves

of the further study resources of society. The recently passed "College Promotional Education Implementation Rules" allows the MOE to use the existing university resources in expanding the life-time learning doorway to the public. This promotional education shall be implemented through distance learning. It is hoped this learning channel will free the general public from most space and time restrictions. Corporate employees may pursue further studies through distance learning, and therefore improve their professional skills and sense of commitment. Inadvertently, the companies will also benefit from the program as the quality and competitive power of their human resources are enhanced.

Furthermore, distance learning is proving to be very influential in the vocational training of disabled persons. Disabled persons should soon be able to acquire education of the same quality at home as at school. Knowledge acquisition is therefore made easier for them. Moreover, a group of students may take a class together, voice and visual transmissions allowing more people to learn and discuss lessons together. Recently, through the collaborative efforts of the Education Department of the Normal University and the Council of Labor Affairs, a program of "Home Vocational Training Program for Serious and Spinal Injury Victims" was initiated. Another example is that Tamkang University established the "Tamkang Visually Impaired Information Network", which is now linked to the Taiwan Academic Network. The program provides disabled persons with a chance to exchange information with the world. In short, not only is it possible to fully utilize distance learning for on-the-job training and education, the public is also able to take advantage of instantaneous and interactive distance learning programs wherever they may be; i.e., in school, library, social education centers, museums, offices, factories or their own homes.

At present, the priorities for the promotion of distance learning has been given to outlying islets such as Kinmen, Machu and Penghu. The facility installations are subsidized, thereby allowing teachers from these less accessible areas to acquire the same on-the-job learning opportunities as those in more accessible locations. In addition, NTU and the Ilan County Government signed an agreement for the distance learning training of government employees. The professional education and training systems in these remote areas are ideal examples of the government's attempt to make up for certain inadequacies in the national educational infrastructure.

V. Conclusion

The ultimate goal of distance learning is to link all the distance learning systems of other countries and provide each person with 'just-in-time' learning, a vivid illustration of the boundless learning environment—"education without frontiers". An individual in any part

of the world may reach beyond geographical borders and enter the program of any school located in any country of the world, at any time that he/she desires. More specifically, using distance learning in providing professional education and training will speed up the NII program. The result: an immeasurable boost not only to the development of technology in Taiwan, but, more importantly, a sharper competitive edge to the whole spectrum of industry and education in our island nation.

Participants in the MOE Distant Learning Experimental Program, Second Semester 1996

Principal broadcasting university (program host)	Program Beneficiaries			Course	Class schedule
	regular universities	teachers colleges	vocational schools		
National Taiwan University	Tatung Technical Institute Culture University			Marine Geology of the Taiwan area Internet Technology Health & Sanitation Multimedia Visual Education Broadcasting	Monday, 10:10 a.m. to 12:00 nn. Friday, 2:10 to 5:00 p.m. Saturday, 8:10 - 10:00 a.m. Wednesday, 1:00 - 3:00 p.m.
Ching Hua University	Chunghwa Technical Institute		Ming Hsin Institute of Technology & Commerce	Human Science IC designing	Wednesday, 3:00 - 5:00 p.m. Wednesday, 10:00 a.m. - 12:00 nn. Friday, 11:10 a.m. - 12:00 nn.
Chiao Tung University	Culture University Yuan Chih Institute of Technology	Hsinchu Teacher's College	Ta Hua Institute of Technology & Commerce	Culture & History International Planning Science & Management Studies	Tuesday, 10:10 a.m. - 12:00 nn. Wednesday, 9:00 a.m. - 12:00 nn. Wednesday, 1:00 - 3:10 p.m.
Normal University	Culture University	Normal University Branch Dept.	Tungnan Institute of Technology Chingwen Institute of Technology & Commerce	Career Planning Music Appreciation	Wednesday, 9:00 a.m. - 12:00 nn. Wednesday, 2:30 - 5:30 p.m.

Central			Wan Neng	Introduction to	Wednesday,
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University Yuan Chih Institute of Technology			Vocational School Chien Hsing Vocational School	Astronomy Business Symposium	3:30 - 5:00 p.m. Wednesday, 1:30 - 2:30 p.m.
Chung Hsing University			Shu The Institute of Technology Chung Tai Institute of Medicine	Computer Networking Internet Resource Utilization & Home Page Production	3 hours every Wednesday
Chung Cheng University	Ching Hua University Cheng Kung University			Psychology and Life	Friday, 1:30 - 2:20, 2:30 - 3:20 p.m.
Cheng Kung University	Chung Shan University		Nan Tai Vocational College Kun Shan Vocational College	Chinese Music Pharmaceutical Identification	Wednesday, 1:30 - 3:20 p.m. Thursday, 1:30 - 3:20 p.m.
College of Medicine, Cheng Chih University	Tainan Art College, College of Medicine, Cheng Chih University		Chia Nan Pharmacology College, Chung Hwa College of Medicine	Food Nutrition & Health	
Kaohsiung Teacher's University			Kaohsiung Shan Hsin Home & Business	Practical English	
Chung Shan University Kaohsiung Voc'l College Kaohsiung Inst. of Technology Kaohsiung Teacher's University	Chung Shan University Cheng Kung University Kaohsiung Inst. of Technology colleges in the cable TV network	Kaohsiung Teacher's University	Kaohsiung Inst. of Technology	Introduction to Investment Mgmt. Technology & Society Electronics, Information & Living Science Education	Tuesday, 1:30 - 3:10 p.m. Thursday, 10:10 a.m. - 12:00 nn. Wednesday, 3:20 5:10 p.m. Friday, 1:30 - 3:20 p.m.

Note: There are 31 schools participating in the experimental distant learning program

1. 17 are regular universities

1. 14 are technical institutes and colleges

1. Chung Cheng University did not join in this experiment, it is connected to the Ching Hua University program through the ATM network.

