

# A Strategy to Promote e-Learning Industry in Taiwan: Network Science Park

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**Abstract:** Since January 2003, a 5-year e-learning national program was launched to assist the development of e-learning industry in Taiwan. One part of the program is to promote the development of e-learning industry by establishing the e-learning network science park. The main idea in the network science park is integrating participators and linking social network. Knowledge and intelligence services are constructed on the Internet to enrich the skill of knowledge works, and products can therefore get closed to the mass market. E-Learning standard promotion agency tries to assist companies follow the international standard for industry expert demarcation. Quality certification agency works on defining quality levels of courses and services; providers may therefore increase the service quality, market may get the different price according to quality level, and consumers may choose from various selections by this rating mechanism. In the park, some application service providers are also generated by the alliance of the companies booked in the park to provide total solutions for e-learning problems. These two years, the digital learning demands and appliances have grown up increasingly, including the promotion of using e-Learning in companies and the support of the development of e-learning industry and company. Some successful models are also set up to follow.

## Introduction

To develop the e-learning industry in Taiwan, our country has executed a 5-years national e-Learning program since January 2003. One of the branches is to set an e-learning network science park (e-park) which aggregates e-learning firms to stimulate cooperation and knowledge sharing. Through frequent exchanges of information and technology or staff, we expect to reinforce the cooperation between the industries to academic circles, business to business, and pioneer the demand. With the aid of the government authorities and the incorporation, international e-learning standards promotion, generation of policies, and operation strategies are implemented to upgrade the productions and increase competitiveness of the e-learning industry based on professionalism and value chain.

Nowadays, the problems of domestic e-learning firms are almost inexperienced, in small scales with less funds, the lack of innovation skills and manpower. Besides, e-learning industry must reach the economic scale to profit and should be the leader among the competitors. It is inevitable that domestic firms have to face the challenge from international firms and sell the products to the world stage step by step. Although we take the advantage of having the same language and culture with China, it is emergent to research and innovate to meet the latest international standards and technology so as to take a seat.

However, the constriction in Taiwan includes several aspects as the following described. About environmental problems: First, Internet bandwidth in some sense always costs too high. Bandwidth price has much to do the utility rate of internet and e-Learning. Secondly, Computer network is not reachable in the out-of-the-way places. Thirdly, e-learning company servers always need higher internet speed when their employees are scattered in different places. Available bandwidth definitely may affect the quality and displayed types of e-Learning materials deeply.

Though lots obstructions may not easily be solved, it is possible to promote what is e-learning, where benefits are, and how to use specific techniques to use e-Learning, like technique support or free consultation or services or partial finance. Besides, setting up some golden models is also a good strategy to make others follow in a similar way. Some e-Learning service companies may therefore setup, corporate, and grow strong in the e-learning market. Techniques and ideas may have various combinations and more product capacity approaching the market.

For giving advice to e-learning industry in Taiwan, we refer how science parks use the regional advantage to create many successful industry flocks and competitiveness. For the reason, we plan to copy the successful model to cultivate the new industry. Yet, most of the current existing e-learning firms are scattered all over the commercial buildings in big cities; it is uneasy but essential to gather to a concrete flock as an industrious development strategy. Arriving the highly flow of IT manpower, we use “network”, the trait of e-learning, to connect all fields. Therefore, we propose the concept ‘e-learning network science park’ to build a network platform to offer the knowledge base and intelligence agency of sharing information technology and communication mechanism. At the same time, firms booked in the science park are enforced to follow the standard, upgrade the quality and technology, promote the development of business, increase e-learning application and values, and reach the economic scale to internationalization. This park at the very beginning planned to use budget to build a network park to aggregate technical reports and market intelligences, encourage the cooperation, and upgrade the capacity and standardization of products. Few years later, we hope the e-learning network park may be financially responsible for profits or losses in business dealings.

## The Study

To assist domestic e-Learning industry, including increase quality of learning content and services to enhance global competitiveness, many industry-developing strategies are surveyed to have regional advantage and industrial value chain to form a critical majority for effective cooperation. Consequently, some people or organizations can focus their resources or funding in a small but critical part of e-Learning services. Distributed expertise may be consisted in variety way to generate more valuable products close to market. Some companies may also organize unions for ensuring their benefits. Similarly, e-learning products or services may therefore do better in every part and become more valuable.

These science parks have experienced half-a-century development. The first scheme was established in the U.S.A. in 1951. An increasing number of science park schemes have appeared worldwide under different names and physical manifestations (Zhang, 2002). Williams in 1982 indicated the essential factors for a successful science park should include ‘Proximity to International airport’, ‘Good road network’, ‘Pleasant residential environment’, and ‘Pleasant working environment’. He also pointed out the important factors including ‘Proximity to market’, ‘Proximity to capital city’, ‘Good rail link to capital’, ‘Specialist labor force’, and ‘Availability of university’. In the 1990s, Luggar and Goldstein conducted an assessment on the impact of research parks on the regional economic development in the U.S.A. They believe regions differ widely in their suitability for research park growth. The main factors include:

- An existing base of research and development and high-tech activity;
- One or several research universities, medical schools, and/or engineering institutes;
- Good air services;
- A well-developed network of infrastructure and business services;
- Foresightful and effective political, academic, and business leaders.

Summary, a park has to be located in a place with (or with easy access to) a pleasant, convenient and supportive living and working environment so that technological entrepreneurs will like the place, and are willing to work and develop their businesses. Universities and research institutions should also involve into the development of Science Park. But it won't be easy to find an available zone close to research institutions, highways, international airport and should be a pleasant residential and working environment at the same time.

In Taiwan, e-learning research departments are distributed in several different universities and institutions. Many e-learning companies have already set up in different office buildings, most of them are in major cities or just nearby. Finding a suitable place to take the region advantage facilitation for e-learning industry might not be easily to find and not very necessary in the meanwhile. Computer network and its application might contribute to

the essentialities of e-learning industry growth, such as online community, web-based knowledge and information system, or portal for content trade or student entry in learning.

Table 1 shows the major facts that lead to success of Science Park and the corresponding methods in e-park.

	Outside condition	Inner management
	Necessarily conditions: Comfortable and convenient living and working environment, ex. Close to national airport, near main roads, close to academic or research institutes.	Necessarily conditions: Hardware facilities Management strategies, tax discount, policy, shared resources.
real park	Finding a suitable place for real park is very important, including convenient traffic, close to major academic research centers, good facility, and comfortable living environment. Well living environment attracts talents involve in production and invention. Close to research institutes may increase cooperation with industries efficiently. New information, new ideas, technique, and market information can therefore share and discuss widely. However, fine places are sometimes hardly be found. Fine location had already been occupied by houses or developed; the same as to a large place nearby relative research institutes.	Flexible design of factory building and infrastructure let customers adjust well. These kind services reduce the defrayal in hardware in the beginning and let companies focus their resources on key points like products or techniques. Management strategies or tax discount or government policies are all also very important to affect the growth of industry .As resource sharing , different industries have different resource and sharing methods.
e-park	Hardly to find a good location, Internet appliances maybe help cultivating e-Learning industry. Social interaction or knowledge sharing in some sense can perform on Internet. Academics and companies can also cooperate via Internet services. Community can also be aggregated to enhance industry developing. That means every e-Learning company can locate in scattered buildings and have the similar regional advantage. The location of company attracts good employees to join the business under sound living functions and environments. Besides, industries demarcation or cooperation between academia and company can also perform closely.	E-Learning company does not need a concrete factory. It is a labor-intensive and technique-intensive industry. About resource sharing, knowledge and information can be setup in Website, including communities. Learning Portal is also meaningful to integrate all learning courses and materials for convenient accessing.

Following are the well-known e-Learning industry enterprise value chain.

1. Create Content, 2. Aggregate, 3. Integrate, 4. Disseminate, 5. Educate, 6. Substantiate.

The purposes of the e-park infra-structure design are to develop e-Learning industry, trying to assist industry in each aspect of value chain. In other words, every company, investor, or industry can benefit from the services in the e-park based on the division of value chain. Strengthening in each part of the e-Learning industry value chain includes the services in e-park or the cooperation of involved companies. Let the diverse professional resources be combined heterogeneously to reinforce the industry in the e-park. Hopefully, many useful and satisfactory products with price advantage will be sold to the market.

The organization of the e-Learning science park includes one consulting department and seven task forces to design, deploy, administrate, coordinate, and manage the development of domestic e-Learning industry.

To enhance the techniques, researches, and inventions, three task forces are launched to assist this task. Task Force 1(Quality Service Agency) provides the review and assessment of e-Learning quality and services. Task Force 2(Knowledge Management Agency) provides an Internet based web site with technical reports, market information, government policy and some other relevant information. Some forums are also included for companies or expertise sharing their ideas and opinions. Task Force 3(Learning materials research agency) provides useful or latest e-Learning course developing methodologies and constrains. In addition, some pioneer techniques, like simulation, modeling, or game based learning, are used as examples to assist students in e-Learning.

To discover the international and domestic market, Task Force 4(International cooperation agency) is setup to seek international cooperation chances, and to lead some companies to provide overseas services. Task Force 5(Learning portal agency) integrates huge amount e-Learning courses from many companies to provide learners a unique learning portal with many courses, learning portfolios and personalization services. Task Force

6(Application service agency) provides services, e-Learning platform, and courses for companies or departments to apply e-Learning into their organizations.

Besides, material exchange agency is launched in task force 7 to provide an integrated material collection for trading. The services in this task force include the bargaining environment, copy right protection, licensee agreement, and price mechanisms.

The goals of three phases of this 5 years project are as following:

Phase 1. Enhance the proficiency and ability of the industry. Through the promotion of e-Learning and meet the standard and quality of e-Learning services to enrich the e-Learning industry.

Phase 2. Construct some successful examples. Use the resources in the e-park to generate some successful appliances as models for imitating or referencing.

Phase 3. Form the industry value chain demarcation for cooperating and producing. Including techniques used in variety way or heterogeneous combination in production. Let creation or idea come true.

In short, the design of e-park and its assistance strategies are based on the industry structure and its value chain. In first, let every company or knowledge works can expertise cooperate based on the value chain. Secondly, try to let each part of the products or service has better performance in quality and standard. Thirdly, form some teams from the current companies in e-park to increase the solving ability and product producing. Fourthly, take the advantage of Internet to setup knowledge and information center and community on Web to enhance the power of knowledge and promote the collaboration between academia and industry. Finally, manage the learning portal to become a critical mass of learning courses and learning materials for customers browsing and purchasing, and for employee to e-Learning.

## Primitive Results

From the beginning of the program to now, the following describes the results of the implementation. At beginning of the program in January 2003, we elect Application Service Providers into the e-park to provide e-Learning services, including assist companies in using e-Learning or providing e-Learning platform or bandwidth or e-Learning experts. And then learning portal is also setup to get the reputation. E-Learning Quality assistance and assessment mechanism is also initiated to assist companies while using e-Learning or developing e-Learning products. At the same time, Knowledge and information management mechanism is also constructed step by step in a form of Internet forum and e-publisher. In January of 2005, content research and trade mechanisms were also launched to assist e-Learning industry developing. International cooperation agent is setup in following to promote e-Learning product to International market.

Application Service Mechanism:

The two management teams of the ASC were selected by the ELNP in 2003 are UPCity and LearnBank. The UPCity is a new established company funded by Taiwan Fixed Network (TFN is one of the four fixed network providers in Taiwan) and Chinese Television System Digi-Tech (CTS was funded by the Ministry of Education, the Ministry of National Defense, businesses in 1961) in 2003. Different to other providers who dedicate to technologies and applications, the UPCity focuses on services. There are five major services which are provided by the UPCity:

- Telecommunication Service: IDC and ISP of TFN
- Platform Service: ASP-based rental platform
- Project Service
- Value-added Service: the channels of the CTS
- Member Service

Unlike the services that provided by the UPCity, the major services of the LearnBank are:

- Courseware Development
- Instruction Design
- Consultative Service
- Marketing Service
- Self-developed Platform (Wisdom Master)

Currently there are 48 e-learning service providers hosted in the ASC and more than 100 businesses from different industries such as Construction, IT, Agriculture, and Tourism apply to use these services provided by the members of the ASC. Until today, the ASC offers over 1,800 e-learning courses (around 50,000 hours lecture) and the effective count for visiting and learning reaches 60,000 (effects of e-Learning park, 2004).

About the two management teams, the revenue of the UPCity in the year 2004 was 1.19 millions USD and there were 23 service providers joined this team. There were 83,400 people used the e-Learning services that were provided by the team of the UPCity; The revenue of the LearnBank in the year 2004 was 5.80 millions USD and there were 30 service providers joined this team, of course, some of the service providers joined both of the two management teams. The counts of pay-for-learning were 180,000.

The platform providers of the ASC had a total 6.23 millions USD revenue in the year 2004. Other service providers of the ASC had a total 9.06 millions USD revenue in the year 2004. Although the data mentioned above was according to the feedbacks of the questionnaires, out of 48 questionnaires we sent out, only 16 have responded. Therefore, the total revenue of the year 2004 that brought by the ASC should be over 32.25 millions USD.

#### Learning Portal Mechanism

Some Taiwan company teamwork (website: <http://www.learn.com.tw>) obtained LPC managerial rights and started business on August 2004. So far, LPC management adopts B2B2C model, encouraging lesson suppliers upload information by themselves via LPC offering mechanism and accept users to question about lessons online or purchase directly. If the special require of products needs more specify, users can leave contact information positively, and then uploading lessons firms explain to users. Basically, engaging education training courses industries are LPC potential target customers. Course consumers are targeted 16~45 year-old people able to use internet.

The current pure e-learning courses ratios out of domestic learning courses are not high. Entity courses are the major proportion, still, mixed courses are on the increase. LPC proposes not only basic and charged service but promotes products. It offers an excellent choice for those who cannot get advanced studies in entity courses. To sum up, LPC presents the followed service:

At the present time, there are 80 firms stationed in, giving around 600 courses in which computer training is the most popular and then language learning, moreover management. EMBA and certification courses occupy the higher ratios in the sum of business.

#### Quality service mechanism:

Improving e-learning quality, therefore at the end of 2004 A.D., we announced quality service norms to have learners, buyers, or e-learning developers the common quality indicators. Different quality service goes with different price. The norm is divided e-learning quality service into three certification types, "learning unit service quality certification", "course service quality certification" and "curriculum service quality certification" to suit different e-learning service institutions. It is specified behind.

##### (1) Learning unit service quality certification

This type is mainly constructed of learning unit, it doesn't form a complete e-learning framework. It often appears inside business e-learning. Applying agency asks quality certification for learning session service.

##### (2) course service quality certification

It is mainly made of course with complete e-learning course structure and perfect teaching plans. It presents a lot in the e-learning manpower cultivating courses offered by e-learning training institutions.

##### (3) Curriculum service quality certification

Participating certification e-learning services are composed of curriculums? It develops curriculum e-learning courses framework and sufficient institutional supports. It usually appears in the e-learning courses proposed by e-learning training institutions with entire skill formation courses.

#### Certification system

Here we build three certification ratings to constrain e-learning service quality. These three ratings correspond to norms and certification credentials below.

##### (1) Class-A Rating.

The rating applies to e-learning service suppliers without online learning tutors. Offering some effective fundamentally essential e-learning services needs to meet the standard. It is a foundation to have the rating for individual or groups.

(2) Class-AA Rating

This agrees to e-learning suppliers with online learning tutors. Unqualified companies cannot present some effective e-learning service. It is helpful to e-learning users upgrading learning efficiency under this rating.

(3) Class-AAA Rating

This rating suits suppliers offering not only online learning tutors but also e-learning resources and activities. Unqualified firms cannot present ideal e-learning service. E-learning users benefit a lot from the credential improving learning efficiency.

Knowledge management mechanism:

Building a software platform, formulating whole functional need standards, considering online operation time to take incremental and iterative developing methods are advantageous to host users' needs easily and be able to handle the function rapidly. From operation setup mechanism, we centers the practice community to gather knowledge and feelings as a growing mutually environment.

Expected service items are included (1) Offer e-learning related knowledge, techniques, standard, products and market analysis researches. (2) Present cooperative channels of e-learning related techniques and research between industry and academic domains. (3) Collect, arrange and analyze e-learning products information and service to build match mechanism with the users. (4) suggest e-learning expertise a place to be shared and exchange.

Functional needs are divided into two blocks: knowledge community and information center. Knowledge center is dedicated to build a sharing and exchanging place for e-learning expertise. It offers e-learning knowledge, techniques, standards, products, marketing analytical reports to join business customers' Power User. Intelligence center mainly proposes industry-academic medium, supply-need medium, and industry consulting mechanism. Because of the limits of difficult techniques and few resources, it is planned this year without realizing.

## Findings

Though we attempt to build an e-Learning science park to take the regional advantage to enhance the industry in Taiwan, some problems have been encountered such as "knowledge management mechanism". The knowledge management agency has many technical reports, news, and successful business models, but those are not yet very welcome within those participators. Considering the cause is that interaction among people or information changes from human entity contact to network communication which makes knowledge on the knowledge management service is far from thoughtful and distant. Consequently, we are trying to enrich the values of those knowledge and information to let business men have interests.

Cost of applying e-Learning does not every company can afford. Self-made business teaching materials are lack of quality due to deficiency of unsupportive system, budgets, people and equipments. Outsourcing materials cost 100,000 ~300,000 NT. Dollars per hour that makes many enterprises get cold feet. For business security consideration, learning system also cost a lot if a company wants to deploy the server inside.

Besides, not lots of suitable e-learning courses have been used to enhance the employees' abilities that cause this kind training mechanisms are still under development. Selling teaching materials are way off needs. Enterprises obtain teaching materials from outside supplier called as "outsourcing material". Most of them are foreign-publishing managerial and English-learning materials. The general problems of managerial materials are culture, customization, and bad after service. First, some materials have no Chinese version. Even if they do, the interpretation is no good. Then, cases referred in materials are from publishing country, though worldwide well-known cases are different from local business environment and culture. It is not familiar and practical to domestic managers. Secondly, domestic firms prefer products customized to match business and yet current internal or foreign materials are standardized which are sold more like publication without customer-made contents. A few companies offer extended customized service outside the materials, just like: education training,

consulting service...etc. to make up for deficiency of standard materials. So far there is no successful model yet. Thirdly, outsourcing materials often encounter the technique problems. They do not content the platform causing learning records lost or inaccurate. Moreover, teaching materials belong to knowledge products needing professional market selling, i.e. consulting sales to have good service. For example: Offering teaching or learning related consulting service positively, in-class or after-class courses or learning resources, understanding learners as improving reference...etc. In fact, it needs trained salespeople and costs highly. In Taiwan's small market, it is unreasonable to ask for the business to invest. Deficiency of coursing service quality or profession, rapidly change of course information, lack of in-time renew instruction system, students' learning unexpected conditions and problem resolution or answering time effect ...etc. are still a long way to overcome.

## Conclusions

For developing e-learning industry in Taiwan, a National e-Learning Program is launched to enforce the services of technology and quality enhancement as well as following standard. A network science park is constructed on Internet to form the regional advantage to assist the development of e-Learning industry. Inside the science park, social network consists of academic, industrial, and governmental participators are reinforced to support the development of e-Learning industry. Seven task forces in the park are set up to assist in e-Learning promotion, including quality service agency, knowledge management agency, learning portal agency, application service agency, and etc. By way of learning portal in the e-learning markets to have learners choose abundant courses through unique interface. With standard consultation and rating of service and quality, correspondent task forces are executed to reach the market requests and increase the industry advantages.

Results of the two years from the beginning of the program, several successful cases of companies profit from e-learning which appeal others to join this field to upgrade business competitiveness and reduce manpower cultivating cost. Besides, knowledge and community management have been set up to support the social network communication, knowledge and information transformation, and business cooperation. Two major application service providers from now on provide total solutions to companies or colleges want to use e-Learning, including servers, platforms, bandwidth, courses, or course services. Though there are still many problems need to be solved, the e-learning market and applications have extended obviously.

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