A Type of Technological Course with using Information Technology

Rong-Jyue Fang, Hung Jen Yang, Hua Lin Tsai, Chi Jen Lee, Tien-Sheng Tsai, Dai-Hua Li

Abstract—The purpose of this study was to develop of information technology and network infrastructure construction On the past decades, educators have developed various scales to measure the learning attitudes. But few of them have constructed specifically for attitudes towards digital devices. This research is discuss the meaning and purposes of Life Technological Course crossing different fields, the strategies of implementation and the integration of information science, and the integration of information technology applying to every discipline. It is urgent to give teachers accurate teaching models of Life Technology Courses complying modern IT technology nowadays. According the discussing, we put forward and implement the tactics to support the reference that scientific and technological teacher crossing different fields and studies the way and information to incorporate teaching of life concretely finally.

Keywords—Information Technology, Technological Course

I. INTRODUCTION

Although some researchers pointed out the days for mobile learning have yet to come [5]. It really works now. Mobile learning is an important learning milestone following e-learning. The term e-learning comprises computer-based learning, Web-based learning, virtual classrooms and digital collaboration. Such as the Internet, intranets, extranets, satellite broadcast, audio/video tape, etc. Mobile learning (m-learning/ mlearning) is a subset of e-learning, and it is the learning by means of mobile devices, that is, m-learning is a new stage of the progress of e-learning [3].

How to implement information science and technology in the teaching of all areas will be one of the main policies for schools to prove the teachers' teaching models. According to a recent statistics, three-fourth of the five hundred investigated teachers indicated their urgent needs of the technological application into teaching. [2]

Therefore, the combination of information science and technology with teaching disciplines is the demand of both the officials and the teachers. However, some teachers expressed their embarrassing situation that the current workload makes it difficult to combine information science and technology with

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their teaching. They regarded it as too idealistic until the situation and problem are solved. All in all, the first consideration of its advocacy should be the deal with present and future teaching modes and provide teachers with practical references to integrate technology in their curriculum development.

The ability of manipulating technology and information is one of the ten core competences which students under fifteen should develop, regulated by the Ministry of Education, Grade 1-9 Curriculum Guidelines, 1997. In which it includes:

(1) to perform the technology and information science accurately, safely, and efficiently.

(2) to collect, analyze, judge, integrate and manipulate the information

(3) to enhance learning efficiency and the life quality.

Moreover, it is assorted to the sphere of Scientific and Technological Courses, including physics, biology, geoscience, and information science. Also, it also emphasizes the respect to lives and ecology, the curiosity to science, and the manipulation of information and technology. As mentioned above, we can realize that the upgrade of technology quality indeed is one of the main spirits of this new course.

When it comes to enhancing teaching modes, the short term goal is to apply computer technology into constructing multiple teaching materials and the learning environment. In the twenty-first century, citizen's attitudes toward using and learning the digital technology may determine the educational and economical development of a socie. How to implement information science and technology in the teaching of all areas will be one of the main policies for schools to prove the teachers' teaching models. According to a recent statistics, three-fourth of the five hundred investigated teachers indicated their urgent needs of the technological application into teaching. [2] Therefore, the combination of information science and technology with teaching disciplines is the demand of both the officials and the teachers. However, some teachers expressed their embarrassing situation that the current workload makes it difficult to combine information science and technology with their teaching. They regarded it as too idealistic until the situation and problem are solved. All in all, the first consideration of its advocacy should be the deal with present and future teaching modes and provide teachers with practical references to integrate technology in their curriculum development.

181

According to the present curriculum schema in primary and secondary schools, the ability of manipulating technology and science is not only restricted in the field of Science and Technology, but is also encouraged in all the other fileds, such as Math, Art, and Sociology. In other words, this ability is strongly connected with all the fields and shouldn't be isolated.

In the twenty-first century, citizen's attitudes toward using and learning the digital technology may determine the educational and economical development of a society. Students' digital attitudes may influence their future involvement in digital-related careers or activities.

II. LITERATURE REVIEW

This curricular revolution meets the needs of the time and suits the development of teenagers. Also, [3] it aims at developing people's various abilities, including sense of humane, ability of integration, spirit of democracy, and the understanding of both local and international ones. Moreover, people are encouraged to keep learning through their lives, i.e. continuous education. [4]

This is one of the main characteristic of Grade 1-9 Curriculum. Because of the un-separated relationship between teachers' use of media and all the learning areas, the application of information and technology will be involved in every teaching activity. Meanwhile, the value of instructional technology is to make the teaching smooth, convenient and efficient, thus, the implement of the new courses will have a positive feedback as far as the IT can be properly used. [7] Since the spirit of Grade 1-9 Curriculum is the Integration of Curriculum, the style of Instructional Technology should follow it as well. [5] [6]

Critical thinking is a high level of cognitive ability. According to[1] [6], critical thinking is to 「decide what to be believed or to be the focused reflective and reasonable thinking. 」 From view of problem-solving, critical thinking is an intellectual activity of choosing proper hypotheses or answers [2]. Norris and Ennis[7] argued that critical thinking can be regarded as a part of problem-solving process generally.

III. METHODOLOGY

As the coming of digital time, media becomes materials which need extra works to be products of the new time—E-media. That is, the manufacture machine is a computer, the process is Digitalization, and the labors will be teachers. As equipped with the proper ability manipulating E-technology and media, texts of modern time cab be easily presented. The follows are some main directions of the production of digital instructional technology.

First of all, teachers should be capable of transferring texts into scripts. Since scripts are visual forms of lesson planes, the rest following jobs are simply following the lesson plans and collecting the related information. The resources are textbooks, handouts, campus journals, data of the community and the internet.

A. The Internet

Also, teachers should make an advanced preparation in case of an unexpected accident. If there are Documents, teachers can make use of Word and save as a HTML file. Also, teachers can complete the work directly by FrontPage.

Teachers should observe different E-teaching principles at all learning areas and collect related teaching samples. Such are helpful for designing E-correspondence modes. It also meets the concepts of Committee of School Curriculum Development. Meanwhile, from the viewpoint of self-made texts from teachers, PowerPoint developed by Microsoft is indeed a good helper. It has multiple functions, including broadcasting and editing films and documents, making slides and handouts.

B. Collect and transfer

First of all, teachers should be capable of transferring texts into scripts. Since scripts are visual forms of lesson planes, the rest following jobs are simply following the lesson plans and collecting the related information.

C. The other tool

Teachers can make use of output from VHS, VCD, DVD and then input those into a computer then save as files. After that, make use of CD burner to compress these images and documents into a CD.

IV. RESULTS AND DISCUSSION

What defines a good teacher is their ability to effectively deliver materials to students. [8] noted that "Presentation Method", which is carried out through speeches, acting, or through the use of teaching aids such as textbooks, audio tapes and video tapes, is the most widespread teaching method. A teacher's ability to deliver a presentation would not be enhanced or diminished by the introduction of novel technologies, therefore one shall be mindful of placing too much focus on the use of multimedia and thereby failing to recognize a teacher's true capabilities.

Technology is not the answer to everything. For one, in emergencies like a blackout, a computer crash, or a shortage of resources, a teacher should be adept at switching to a teaching method that does not rely on high-tech products, however tech-savvy they might be. There are also situations where, for example, a simple poster might do a better job of explaining a concept to students than a high-tech learning environment.

An educator should be familiar and flexible with an array of media to suit the needs of the courses, [4] proposed in their "Multimedia" concept. The use of digital data is ideal for this sort of media switching, as it can easily be moved from platform to platform, and readily converted to different formats to meet the requirements of various technological equipments. An educator's command in digital technologies is therefore crucial.

It aims at rising the effects of teaching, but it is a successful curriculum development that really matters. In the schema of Grade 1-9 Curriculum, a teachers' curriculum development ability is the core competence to integrate the curriculum. When it comes to the design of curriculum and teaching

activities, [5] indicated that keeping modified teachers' thoughts and methods via the internet.

Computers are not only used in the computer room and in every classroom. The curriculum development doesn't follow the linear mode but the non-liner one—hyperlink. Hence the teaching methods need to adjust. Teachers at digital time should welcome the new technology and be capable of developing new teaching methods to cope with the teaching job.

V. COLLABORATIVE ONLINE NETWORK

Due to the liberalization of global economy, all trades and professions emphasize on the promotion of English comprehension in order to expand their international markets, and to keep themselves in the same pace with global economic development. To improve the competitiveness of the country, the government has proposed that enhancing students' English comprehension as an important policy. The Ministry of Education suggests the perspective of 'Creative Taiwan, connecting globally', in which 'fostering talents with foreign language abilities' is one of the action plans. Due to the universal availability of the internet and the rapid development of multimedia techniques, e-learning has become an important learning tool. Digital teaching materials produced with multimedia films and pictures provide various and more active content of courses. Meanwhile, there is less restriction on space and time using digital teaching material and that provides a more interactive and convenient learning environment. Therefore, using multimedia digital teaching material on international interactive teaching is a necessary way of learning in this digital era.

The Ministry of Education has provided many resources of learning, such as the teaching resources center, the Six Major Learning Systems, and seeded schools to encourage teachers applying computer into their teaching, and to encourage students using internet. The digital plan of augmenting manpower will bring wireless internet to each school, each city and county. Thus, instructing teachers and students in using online information to connect with the world currently becomes an important issue.

E-learning has been developing in recent years. There are many academic organizations using internet as a learning bridge among students to enable them to make use of online resources and to connect the world. Multimedia and interactive e-learning are used to narrow the gap among students, to promote international cooperation, and to implement international exchange. Currently, there are 3 million students and 250,000 high school and primary school teachers. If we can strengthen the use of internet on teaching, it will be helpful for interactive learning.

VI. DISCUSSIONS ON WEB-ENHANCED PROJECT-BASED LEARNING IN CONNECTION WITH THE WORLD

Recently there have been teachers trying Project-based learning (PBL) which is different from the traditional teaching method. PBL emphasizes on helping students apply what they have learned into daily life innovatively. PBL is a constructivist approach which provides learners a complex and authentic project in order to have students find subject matter, design questions, draw up action plans, collect information, solve problems, set up policies, complete research process, and present a learning mode of the project. his learning mode integrates learning of life experience and inter-disciplinary courses.

1. Inter-Disciplinary Courses and Problem-Based Learning

[11]pointed that interdisciplinary courses have four features. First, inter-disciplinary courses are based on important issues in real life and thus it is similar to the nature of project-based learning. Second, inter-disciplinary courses apply knowledge of context rather than limited to knowledge of subject matter. It conforms to the feature of project-based learning that it is inter-disciplinary and designed to explore a question which combines contexts in real world. Third, inter-disciplinary courses do research on current issues, not on a subject. Project-based learning also does researches on current social or scientific issues and aims at fostering student's ability in exploration and research. It is not limited to the aim of the courses, either. Fourth, inter-disciplinary courses emphasize on applying knowledge and solving problems which are also one of the key features of project-based learning.

2. Discussing Project-Based Learning with Constructivism

Constructivists consider that knowledge is understood by a learner's construction. Students should express the learning results by applying surface features of diversified knowledge. Knowledge and techniques already possessed by a learner may influence on learning something new. Learning cooperatively and learning to interact with communities will help in depth learning[14]. PBL also emphasizes on a learner's construction of knowledge, and thus adopts a learner-centered model. Instructor will not tell the answer but instruct students in exploring questions and trying to solve problems. Learner constructs his/her knowledge by himself/herself in the process of exploring. Products of PBL can be presented with oral presentation, website, and briefing, etc.

3. Cognitive Psychology and PBL

Huang & Hsu pointed that cognitive psychology highlights on learning motivation, fostering students' meta-cognition and ability of self-management which are related to PBL (1). Learning motivation: a learner who has internal motivations attends an activity based on his/her interests. (2). Meta-cognition and self management: Bereiter and Scardamalia indicated that the difference between an expert and a beginner lies in better meta-cognition and ability of self-management an expert possesses. Meta-cognition is the cognitive process and the results of a learner's self-examination. A learner will have more efficient process of learning if he/she knows his/her cognitive process, adjusts his/her learning pace, and adopts remedial measures when

facing difficulties. (3). Context: cognitive psychologist place emphasis on the importance of context, considering that learning may be more efficient if the learning system is closer to real life[15]. PBL chooses the important issues around the world and encourages a learner to apply what he/she has learned to make a decision and solve the problems.

4. PBL and the Internet

Added on the elements of science and technology, PBL is different from the traditional teaching method either on the development of course content, or the way of delivery. Teachers can apply internet technology to create different learning opportunities, obtain learning resources, manage teaching resources, and evaluate students' learning results through internet.[16]Information Technology-Assisted PBL can help students develop diversified skills, enhance research skills, and master diversified evaluation methods, such as self-evaluation, peer evaluation, and learning process files, etc. Furthermore, it can promote common consensus in a community through online discussion board and interaction between peers, instructors, and experts. [17]

5. The Internet Provides Learning Communities Channels for Collecting Distributed Knowledge

Learning communities are formed by learners based on different social relationship, such as schools, clubs, organizations, and neighbors, to provide learners a learning opportunity. [18] In this learning environment, the emergence of knowledge relies on the interaction in the community to integrate professional knowledge possessed by different members. Therefore, [19]indicated it as 'distributed cognition' in a learning community. Learners can share their views on how to solve the problems and reach an agreement to examine and solve the problems collaboratively. The Internet plays an important role as the medium for communication in integrating distributed cognition.

6. The Internet Provides PBL Functioned with Scaffold Knowledge Integration (SKI)

PBL is used widely in teaching strategies. The typical mode is the Knowledge Integration Environment (KIE) in University of Berkeley. (http://kie.berkeley.edu/KIE.html)[20]pointed that the four points of SKI are: 'identify new goals for learning,' 'make thinking visible,' 'encourage lifelong learning,' and 'provide social support.' These promote learners' ability to solve problems through repeated examinations and correction.

In a word, this project is expected to encourage schools and local communities to share resources, achieve development collaboratively, and enhance the connections between school education and the world. Students from different countries share learning experience through the process of exploring the issues, researching, and designing websites. We would hope to develop this project which can serve as a bridge for children in the world to encourage them care and help each other.

VII. PURPOSES OF THE PROJECT

This project aims at providing opportunities for students attending international activities under their teachers'

supervision. The purposes of it are as followed:
1) To foster juveniles' abilities of attending projects, and promote their competitiveness.
2) To broaden juveniles' views, develop their scientific and humanistic care.
3) To broaden juveniles' views, develop their scientific and humanistic care.
4) To enrich international teaching activities, and develop friendship.
5) To enhance students' ability of communication, and students' global vision.
6) To advance students' communication ability in English.

This project combines digital information and the Internet to instruct students using PBL to search information to progress online teaching and learning.

VIII. SCHEDULE OF THE PROJECT

This project is scheduled from August, 2005 for three years in three phases:
1. Starting the project (August,2005-July, 2006)

. Develop interactive mode of learning online.

. Search for foreign partners.

. Decide purposes and methods.

. Train teachers with action research.

. Learn interactively online.
2. Cooperation Period (August, 2006-July, 2007)

. Advance international exchange. (It holds interactive and non-interactive activities.)

. Encourage teachers to have international exchange.
3. Creation Period (August, 2008-July, 2009)

. Learn collaboratively.

. Attend foreign web-based competitions.

This project is designed because juveniles should be encouraged to care the important issues around the world, to work collaboratively with team members, and to broaden their global views.

IX. CONTENTS OF THE PROJECT

1. Purposes

. Connect with the international society.

. Develop students' ability of project-based learning.

. Explore international issues.

. Enhance students' abilities of foreign languages.

2. Set up the Website

The website is set up as the center of communication. Teams, information, and interactive functions will be provided online, including:

. Teaching platform: including courses and members

management.

. Interactive platform: including interactive texts, emails, international members, and the discussion board.

. Web server: providing storage space for members.

3. Members

The major members are students from primary schools and high schools in Kaohsiung, as well as those in southern Taiwan. Each teacher instructs 3-5 students. 400 teams are expected to join this program.

4. Procedure of the activity (6 months for each session)

A.   Organize teams.
B.   Search for international partners.
C.   Register to attend.
D.   Propose the plan, and set the title.
E.   Start international activities.
F.   Record the process.
G.   Write reports.
H.   Attend related international competitions. (Optional)
I.   Publish results on the website.
J.   Invite experts to evaluate the results.
K.   Announce outstanding groups and award them.
L.   Hold international workshops to share experiences.

5. Modes of Activities

A. Titles can be decided freely by each team, either learning subject matter or English.

B. Partners can be searched by each school or assisted by this project.
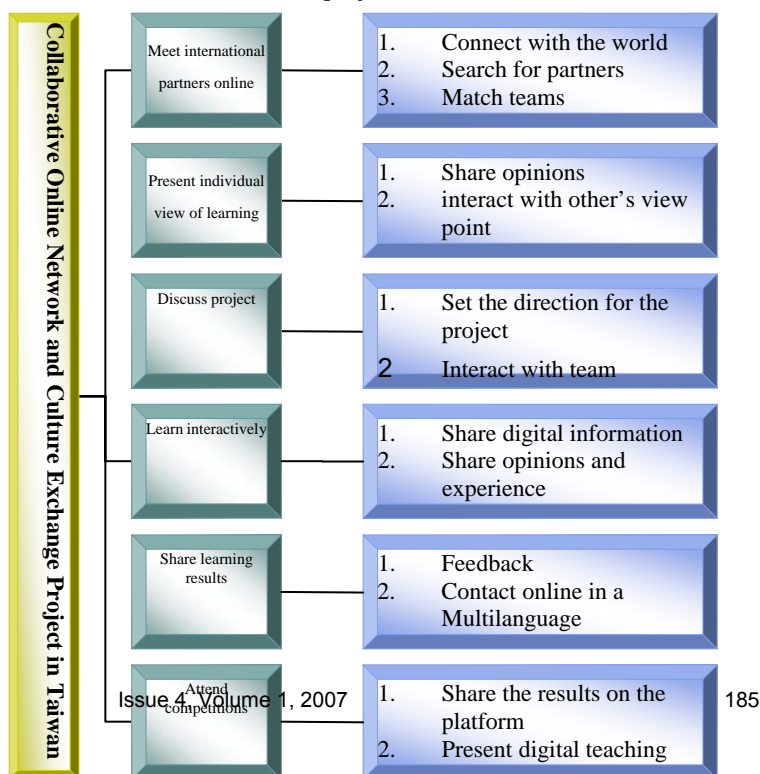
6. Networks

There are four networks:
a.   International Education and Resource Network (iEARN)
b.   Advanced Joint English Telecommunication (AJET)
c.   Asian Student Exchange Program (ASEP)
English teaching (such as international online teaching)

7. Contents

Table 2: the structure of the project

This project is aimed at building a high-quality online learning environment, integrating learning resources, improving online learning environment, and stimulate teachers' motivation of learning. It is hoped to promote e-learning at domestic schools and to achieve the perspective of 'Creative Taiwan, connecting globally.'

X.   MEMBERS OF THIS PROJECT

This project will be attended by the teachers and students in Department of Applied Foreign Languages in Shu-Te University of Technology.

Table 3: Structure of members in this project
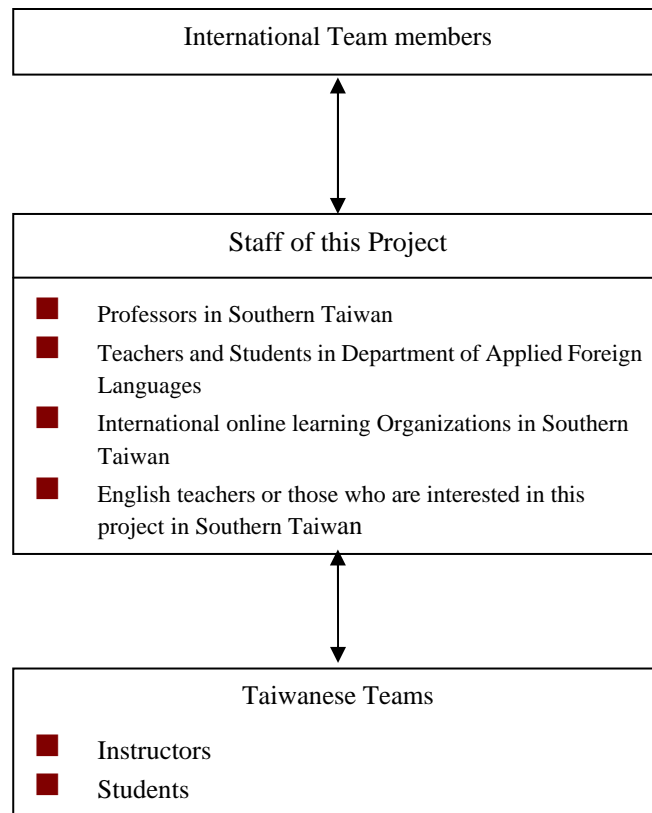
XI.   EXPECTED BENEFITS

400 teams (around 2,000 students) from 40 countries and 800 teachers are expected to attend this project. It is hoped to achieve the goals as below:

1. Encourage students to learn actively.

2. Broaden students' global vision. Understand diversified cultures.

3. Foster Students' abilities of communication in English.

4. Train students the techniques of doing project-based research.

XII.   CONCLUSION-- DEFINITION OF MOBILE LEARNING

Many authors are arguing that the growth of pervasive, ubiquitous, computing will have a large impact on learning and think the m-learning is defined as e-learning through mobile computational devices. In this section, we applied the previous literature to discuss the definition of different scholars. As described by Patten, Sanchez & Tangney[9] that many applications currently available merely leverage off the mobility of handheld devices to replicate or augment existing learning scenarios and the most appropriate use of handheld devices is to be found in the synthesis of appropriate use of the technology and sound educational underpinning. M-learning intersects mobile computing with e-learning; it combines individualized with anytime and anywhere learning [10]. Learning with a wireless and handheld device, the relationship between the device and its owner becomes one-to-one, always on, always there, location aware, and personalized [10].Tatar et al. [12] defined the combination of e-learning and mobile computing is called mobile learning (m-learning) and promises the access to applications that support learning anywhere, anytime. Accounting of Ally, M. [2] the use of mobile devices in learning is referred to as mobile learning (m-learning): this is the delivery of electronic learning (e-learning) materials on mobile devices such as personal digital assistants (PDAs), mobile phones, Tablet PCs, Pocket PCs, palmtop computers, etc. Georgiev, T. et al. [8] describe that distance learning, electronic learning and mobile learning offer methods, which decrease the limitations of traditional education. Historically the distance education has more than one hundred years of experience and traditions. Its main characteristic is the distance and time separation between teacher and students. The e-Learning offers new methods for distance education based on computer and net technologies.
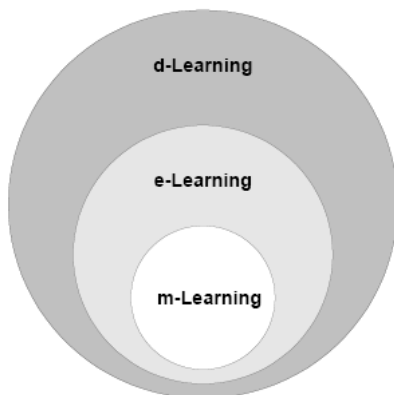

Fig.1. The place of m-Learning as part of e-Learning and d-Learning Source: M-Learning - a New Stage of E-Learning by Georgiev, T. et al. [8]

Teachers of different subjects can divide themselves into groups and look for certain topics through the searching engine. After that, a systematical classification is in need. Then all the teachers and students can utilize it. The second stage is to think of Internet as teaching materials. Encourage students and teachers communicate by emails, news groups and message delivery tools. Cooperative learning is strongly recommended at this stage. Teachers will give students a task and ask them to solve it in time. When students exchange their information by

emails, a duplicate is asked to send to their teacher so that the teacher can handle the progress and give them a hand immediately. The last stage is to involve Internet into teaching, that is Web_title. Just like CAI, there's no time and space limit by means of Web_title. Because people can be anonymous on line, some introverted students can express their ideas and thoughts with fear on line and practice their critical thinking. May be one day. popular of information science and technology has become necessary and it will be an important issue that how to make good use of technology to meet the future educational trend and the needs of modern teaching modes.

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