A study of Life Technological Course of using Information Science and Technology in Cross-area Learning

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ABSTRACT: This research is trying to 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: Life Technological Course, Cross-area Learning

Introduction

Owing to the needs of Technology Time and the foundation of a completed teaching situation, the Ministry of Education has integrated the following projects—The Promotion and Development of Computer Assisted Teaching Program, The Upgrades of Technology Education for Schools at All Levels, and The Basic Technology Education. It was initiated in July, 1997 and it will last until June, 2007. The short term purpose is to widen and deepen that three projects’ main events and the long term one is to develop an omnibearing technological teaching environment and popularize Technology Education to all the people.

The main events of the project are as follows: to augment technology teaching materials, to enhance teaching modes, to strengthen brains education, to adjust the organization system, to advance the apparatus, to amplify TANet, and to cultivate senses of Technology. 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. The long term goal is to apply CAT to all subjects and combine the networks with distance learning setting, and thus carry out the ideas of individual learning and multiple learning.

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. 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.

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.

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 filed, such as Math, Art, and Sociology. In other words, this ability is strongly connected with all the fields and shouldn’t be isolated.

As for the brains education, teachers should upgrade themselves positively. As far as teachers themselves can use the media and technology easily, they can put it into their curricular development naturally and efficiently. In fact, this is the only path to achieve a successful media teaching and to carry the spirit of technology and information through this new course.

2. Literature analysis
To be competitive, the urges of educational action plans overwhelmed the world. Developed countries, such as the UK and the States, announced the national education polices, emphasizing the basic abilities instead of the knowledge-oriented ones. Taiwan is not left behind. We began to execute Grade 1-9 Curriculum since 2001.

One purpose of Grade 1-9 Curriculum is to combine the elementary curriculum with the junior high, integrating and re-dividing all the subjects into seven main learning areas. The other purpose is to encourage teachers to teach creatively and then cultivate creative students. By means of education, we can develop modern, creative, and initiative people, and thus take a place in the world wide competition. The core of Grade 1-9 Curriculum is not teachers nor textbooks but students, focusing on their daily experiences and developing their independency and problem-solving ability.

In terms of teaching, Grade 1-9 Curriculum focuses on the integration of all subjects, breaking the traditional subject-oriented curricular development. In which, teachers are expected to consider students lives experience, traditions, folk customs, and local characteristics, and put these elements into teaching. [3] This curricular revolution meets the needs of the time and suits the development of teenagers. Also, 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]

The seven main learning areas are as follows: Language Arts, Health and Physical Education, Arts and Humanities, Science and Technology, Mathematics, and Integrative Activities. 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] indicated the principles of curricular integration: (1)Integration within texts (2)Connection between subjects (3)Integration between texts and school activities (4)Combination of learning and life experiences. Whatever principle is followed, there are two main types of IT: (1) the core curriculum can be divided from the secondary courses. That is, IT as a means of teaching. (2) Either core or secondary curriculum should be combined with each other.

3. The characteristics of cross-area learning
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 can be easily presented. The follows are some main directions of the production of digital instructional technology.

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

3.1.1 Documents:
the resources are textbooks, handouts, campus journals, data of the community and the internets. Type what are collected and save as a Microsoft Word file.

3.1.2 Motionless Images:
including photos, pictures, slides, the internet. Save these images as .jpg.

3.1.3 Dynamic Images:
including VHS, V8, and the internet. Save them as .avi or .mpg.

3.1.4 Soundtrack Recording:
including audio tapes, CDs, and the internet. Save them as .wav, .mp3.

3.1.5 Animation:
including related image banks, clip art library, data base, and the internet. Teachers can also make good use of certain program to produce animation by themselves. Save these as .gif.

3.2 The preparation for PowerPoint
PowerPoint is a good way to produce digital texts. The process are as follows:

3.2.1 Words:
Make use of PPT or Word.

3.2.2 Images:
Draw by PPT or other programs, inputs of Scanner or DC, past and post from the Internet.

3.2.3 Others:
sounds, animation, special efficacy, and films. These are internal functions of PPT.

3.3 CDs
Teachers can make use of CD burner to store a huge amount of data easily.

3.3.1 Material Resources:
self-made and ready-made

3.3.2 Process:
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.

3.3.3 Form:
CD-ROM, Audio CD, VCD, and DVD. DVD has a larger storage room.

3.2 The Internet
When it comes to E-learning, teachers should consider the updates of the texts, the effects of E-teaching and if the texts design suits the teaching activities. 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.

Invite Professionals to build a digital data base for e-teaching. Furthermore, the professionals can solve the problems of skills while the teachers can develop better curriculum in this way. This is a microscope of cooperative works. It also meets the concepts of Committee of School Curriculum Development.

Teachers in the 21st Century should follow the four directions and polish their own ability of producing E-instructional medium. 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. If teachers can make good use of this kind IT of multiple functions and integrate it into their teaching, it will be easier to inspire children’s Multiple Intelligence. That’s why the familiarity of PPT is the attainment indication of American
Teachers’ technology competence. All the teachers should make PPT handy and make good use of it.

4. Present conditions with the Grade 1-9 Curriculum
With the advent of technology and the reform of curriculum, choke board writing and monotonous lectures have become something of the past. How to educate in an effective way is a pressing question that educators should ask themselves. Becoming well-versed in new technologies is an obvious solution. More importantly, a few perspectives are important for anyone who would like to cope with the trend toward incorporating technologies into traditional teaching methods.

4.1 A good teacher can never be replaced by even the best software or hardware.
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.

4.2 “Low-tech” methods can come in handy in undesirable situations
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.

4.3 Use the teaching equipments and venue to a teacher’s advantage
An educator should be familiar and flexible with an array of media to suit the needs of the courses, [8] 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.

4.4 Upgrade curricular designing ability to integrate curriculum with technology
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, [9] indicated that keeping modified teachers’ thoughts and methods via learning and communication is the inevitable process of IT.

4.5 Always ready for latest technology and develop a new teaching method
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.

5. The process of implementing cross-area teaching and learning

2.1 The policies
Professor Hsieh defined Information Science and Technology as a new system or a new way to propagation via digital electronic media. [4] There are six elements in subject-oriented teaching activities—purposes, students, contexts, environments, teaching principles, and teachers. And IT should be applied properly to all these elements. The following are different types of IT in school setting: PC, Computer Room, area network, and the Internet.

2.1.1 The combination of PC and audiovisuals
Teachers should undergo personal and educational information production and spread via learning the use of PC. It can help the batch processing of
documents, the construction of teaching materials data base, the gains of latest information, and rise the efficiency of designing teaching activities. Meanwhile, because it is reproducible, teachers can save the time coping with repeated stuff and make use of the time to interact with students. Owing to the audiovisuals in the classrooms, teachers can make their teaching more flexible and appealing. That is, make the biggest efficiency under the time limit. It is especially useful in the Warm Up and the Presentation when it comes to abstract texts, such as the growth of a planet.

2.1.2 The broadcast system in the computer room
There is at least one computer room in every elementary and junior high school. Making good use of the broadcasting system in the computer room and combining it with subject teaching are helpful to achieve the teaching purpose and meet individual meets.

(1) The teacher broadcast his screen to all the students
(2) The teacher broadcast a students’ work to everyone
(3) Supervise/ Monitor students’ screens in terms or specifically
(4) the inter-control of keyboards and the mouse between teacher-students
(5) Online discussion with groups

It is helpful to make abstract ideas more concrete and provide students with opportunities of interpersonal observation, inspiring their motivation and creativity. Moreover, because teachers can monitor students’ screen at any time, the assistance can be made in time and then enhance student-teacher interaction. Also, because it offers students means to communicate online, the computer room is not only a place for learning technology and information science, but also an important learning setting for other subjects.

2.1.3 The area network server
Area Network means the connection of all the information instruments via wires to attain the share of software and hardware and then advance the ability to apply the information system. The main difference of Area Network from the Internet is the high rate and the great flow. It is helpful in constructing a campus internet media center by VOD and manage the software and audiovisuals efficiently. Adapt CAI via Area Network or combine Area Network with the computer room will definitely enhance the efficiency of teaching.

2.1.4 Apply the Internet to teaching
The population of serving the Internet was 2.2 million in 1998, and it keeps increasing. Owing to the amazing population, Internet has become the biggest markets both for business sites and commonweal sites. How to make a proper use of such a huge digital data base is one of the main lessons that a teacher should learn. There are three stages of the Internet application to instruction. First one is to view of Internet as teaching resources, collecting the necessary information world wide. 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.

6. Conclusion
R. McClintock at the University of Columbia, Teachers College, indicated that digital libraries, multi-media and personal technological skills will bring the society and its education a brand new facet. [1] On the other hand, information science and technology, digital resources and multi-media will have a great impact on learning and teaching and thus results in a huge change. The main reason is the implement of information science and technology. It is a tool not only for problem solving, but also for cooperative learning and message delivery. To have the most efficiency on instruction, it should be integrated in the teaching activities of different learning areas. Such won’t increase the burden of learning, but, in stead, makes learning more efficient, individual and multiple. As what Thomas mentioned[7], the development and application of information science and technology have made the breakthrough of teaching modes, solving certain
teaching problems such as the difficulties of presenting abstract texts.

Despite the current problems, including the pressure of evaluation and the time limits of curriculum progress, it is still practical to apply technology to all the subjects. After continuous improvement and modification, subjects have been integrated into core competences by the year of 2001, and the 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.

Reference