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THE ACTIVE AND INTERACTIVE THINKING LEARNING RESEARCH IN "FLIP EDUCATION"

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ABSTRACT

In 2014 a total of 183 schools and 40 high schools participating in the experiment, the schools are in the Tablet PC as a learning tool, application-oriented learning and teaching strategies topics flipped learning, so that students in the teacher's guide concept after active exploration program, in peer under the cooperative learning deepen CBC. After the rise of the majority of primary and secondary schools flipped classroom teacher began groping flip-teaching philosophy, the domestic schools have been put into digital teaching become common trend, there is a period of systematic research in schools to promote the use of the Internet and action vehicles, auxiliary in teaching of information technology equipment, emphasizes active learning, enhance learning interaction between teachers and learners understand and factors influencing teaching effectiveness, so with this initiative (active) and interactive (interactive) flip teaching experiment program.

Keywords : Flip Teaching 、 Interactive Learning 、 High Order Thinking Skills

INTRODUCTION

The GDP declined over the past fifteen years, due to uncreative students unable to increased domestic production value while these students cast into the community . Now the competition is not in factories but in schools, this driving the educational innovation in teaching strategies, nurturing talent education need to be adjusted. The current educational reform trends including:(1) stimulate active learning, (2) encourage cooperative learning,(3) provide personalized learning environment,(4) effective learning, (5) fair learning. Education reform is urgent imperative in Taiwan to meet global challenges.

The flip classroom growing up, teachers of primary and secondary schools began groping flip-education philosophy, they make the past teaching described into video and recording into the clouds, so that students do preview or review before or after school, such become mainstream teaching, mainly current high school and college application system not completely removed, exam still remain in the Bloom teaching, cognitive learning , students can cope alone memory test, but after the course easily forget. Digital teaching become common trend, for research the effectiveness and impact of teaching factor, hence make an active and interactive flip education experiment program.

This project will provide a source of knowledge teaching in the digital cloud environment to stimulate motivation for active learning, via two schools as an experimental field of teaching, curriculum materials including primary and secondary schools to complete an experimental study.

LITERATURE REVIEW

Flip Education

Gerstein (2011) considered that can be independent learning in flip teaching, e-learning, watching movies is just one option only, game simulation and interactive learning site (or Apps) resources, are possible options, the whole learning experience all made by teachers.

The implementation of "flip education" ,is to transition from knowledge receiver to an active learners , because information transfer (lecture) is only the most basic level of learning activities.

In the "flip teaching" situation, Benjamin Bloom's cognitive teaching objectives viewpoint, the lower levels of "memory" and "understanding" ability is accomplished via independent learning, and "application", "analysis", and " evaluation "and" creating" the higher levels boot by the classroom teacher and cooperative learning to interact with their peers ; in other words, in the traditional teaching, students extremely difficult to develop the" evaluation "and "creating" higher levels cognitive abilities, but now may have more opportunity in "flip teaching" to change traditional teaching methods, by " interactive "situations and other guidance .

Digital Learning Theory

Enhance environmental incentives behaviorism

The behaviorist proposed through activities to for student learning, which allows students to change behavior from observation. Learning is through repeated stimulation and feedback. That often used in the field of computer-aided learning rendering stimulus, and the student find solutions to solve the problem as response, by means of the system provides feedback to reinforce learning.

Student learning progress be given to the results of stimulus and response, learning environment more recognize and exploration than active learning. Internet provided e-learning environment in depth connotation, to stimulate behaviorism, the reaction theory, and observe the reaction of the students' learning, and record learning outcomes.

Digital learning Scope

For several years domestic schools promote e-learning platform ,the effectiveness is being questioned, the main reason is that digital learning platform mere formality only can download materials, watching the syllabus, homework submit and other functions. Which lack of situational exercises to learn from each other, and problems solution limited to train students from contextual learning, for the students to learn through the cloud computing environment ,teachers need to put up scaffolding guide the initial build environment. Because the student knowledge is insufficient. This is in line with constructivist advocated, through the Arrangement student knowledge to construct new concepts.

Most constructivist (Bischoff & Anderson, 1998; Novak & Gowin, 1984) believes that prior knowledge is the follow-up related concepts in learning. Therefore, the study architecture in accordance with the theory of constructivism, provide students cloud computing environment, a community learning platform scaffolding , and experiential learning situation, coupled with student collaborative learning , can enhance the ability of independent study and application of knowledge and so on.

Active learning: effective learning ability

"Active learning" emphasizes the "analytical thinking" importance. Study should marked by " people own mind," according to the mark been done in order to recall. How to mark in the mind as a sign? Through homework analysis , students set question and process of answer by familiar knowledge, that is " known absorb an unknown." This "question and answer" is an integral part of the learning process, the most important key. Students start the correct reading and get major concepts for himself the right notes

"Active learning" is the "hourglass learning," When students systematic analysis and compress information, to find the essence of the data, the key lessons, grasp out the key points, naturally impressed by lots of information .the compress and release process, place homework in long-term memory , through these tips in exams, recall the relevant homework, such a better learning. Hourglass active learning is to teach students to organize their own learning priorities, smoothly absorb knowledge.

High-level thinking

High-level thinking or complex-level thinking, the corresponding is Basic-level thinking. Prior to learn complex cognitive skills, shall learn simpler cognitive skills; therefore the effective application of high-level thinking must be based on the basic level thinking. The basic-level thinking including memory, recall, basic comprehension and observation skill. The high-level (complexity level) thinking involves multiple possible answers and participants judgment. Udall and Daniel (1991) consider that the high-level thinking includes three way thinking: judgmental thinking, creating thinking and problem solving.

Thus, high-level thinking involves a series of proactive process to a judgment making, decision making, problem solving, to construct and communicate ability and willingness. In these psychological process, thinking the situation appropriately ,selecting, combining and applying its related knowledge and skills, and to monitor and adjust their thinking at times.

Figure 1 shows constructivist learning with high-level thinking skills learning.

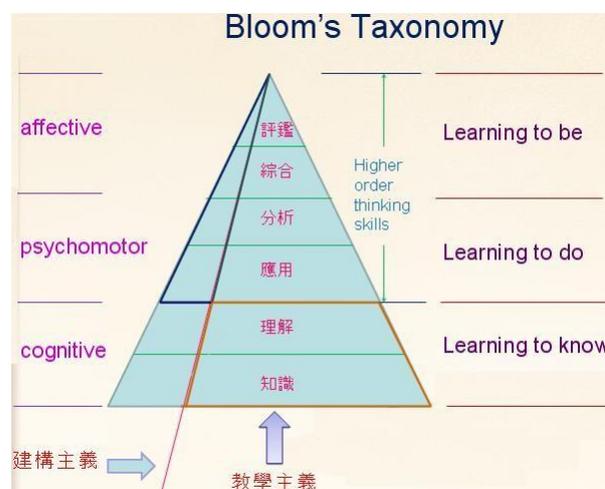


Figure 1. Constructivism in Broom cognitive learning classification

Teaching Quality Assessment

DeLone and McLean (1992) proposed that system quality and information quality will affect the use of information systems and user satisfaction, and above both will be affected individual impact, and further occur organizational impact.

Although DeLone and McLean (2003, 2004) pointed out that the quality of the three information systems: information quality, system quality and service quality as the intent of using the antecedents, but some other scholars, such as: Jeong and Lambert (2001) combine this three factors into a single facet, to explore the connection between behavior and its intention, therefore factor analysis to confirm the discriminant validity convergent validity between the three factors, to learn more about the quality of the facets of information systems, that will be relatively substantive approach.

Teaching quality result can be obtained from information system success model, successful model will include three independent variables and a dependent variable, the three independent variable is the quality of teaching-learning, which depends: information quality, system quality and service quality, and the reaction to the teaching quality can be analyzed as follows:

System Quality (hardware platforms): Internet service, platform, vehicles.

Information quality (teaching software): curriculum, teaching materials, screen design, interactive mode.

Service Quality (teaching activities): teaching strategies, curriculum, tests, exercises, assignments, etc.

The digital teaching applications of cloud computing services

Digital teaching can be divided into two levels, "teach" and "learn": (1) "Teaching", teacher-centered, use E of equipment for teaching; (2) "Learning" is a student-centered learning allow students to use the Internet learning.

"Digital teaching" is basically using the Internet and information equipment, such as the Internet, computers, digital lectern, projectors, interactive whiteboards, teaching network cameras, etc., the Internet as a medium, delivery teaching digits material to the distal end learners. Its feature is the use of Internet as the main medium of instruction, learners and professors who are available in different time, space,, asynchronous communication mechanism to reach a learning network through two-way synchronization, the main advantage is that without the barriers of space limit, can be anywhere, anytime learning and interactive learning unlimited number of teaching materials can be reused, and can record the learner's learning process via the learning system (Wen & Chen, 2011).

Highly interactive teaching methods

Another industry-university research project plans by the host of this case, the development of highly interactive synchronous teaching system can also be described in this era of science and technology information explosion, people learn through the use of diverse media and different learning styles, with the advent of carrier operations, 3G unlimited internet popularity, the promotion of paperless concept, various service applications, establish ubiquitous personal learning environment, anywhere learning, not necessary to be tied in front of the computer, not limited to the classroom. Learners can pre-loaded in their vehicles, the application increasing its elasticity. This system meets student career development, self-study purpose of action in response to the trend of which is shown in Figure 2 illustrates the use of design.

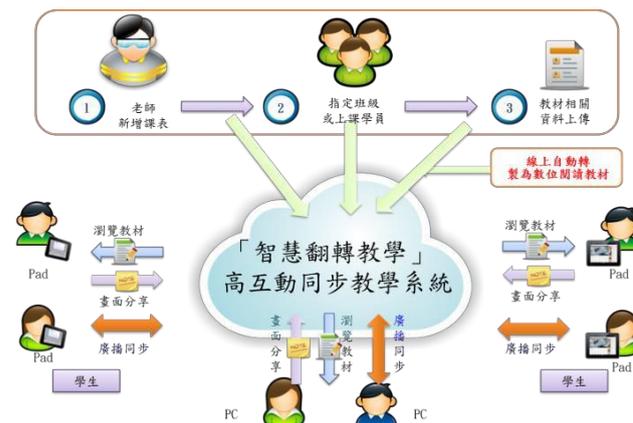


Figure 2. The Educational Technology operation mode

Teaching and learning highly integrate interactive application mode

Demand of teaching is unlimited, creative imagination is infinite, classroom teachers and learning system development direction and concepts illustrated as follows:

- (1) Interactive Teaching System simulcast Construction
- (2) Provide a variety of operating modes and auxiliary teaching tool

- (3) Provide classroom Measure assessment mechanism
- (4) Instant Watch Results
- (5) The learning feedback course

RESEARCH METHODS

In this study, to built up a cloud "Teaching" and "Learning" environmental operations, divided into Moodle LMS teachers teaching platform for students to share with the course of study data collection, and students interactive Google autonomy learning platform .Teachers disseminate knowledge, design materials and planning teaching activities. Students learn to communicate as interactive learning platform , through teaching and research planning, implementation and evaluation of the three phases, and construct network learning behavior theoretical model to know the learning effect, and other factors.

Selected Learning Courses

Study flip courses Learning Behavior in selected primary and secondary schools students of all grades, grouped with the school e-learning platform and cloud computing environment as the main learning platforms, by learning behavior analysis and comparison between platforms, influence factors and learning outcomes between the two.

Cloud Service Operations mobile devices

Cloud computing environment in addition to e-learning platform in the fixed desktop computers connect to the Internet but also stressed that action learning omnipresent, and action learning environment with small , light, wireless transmission, handwriting input, portability and other features for indoors, outdoors individual or group work and other learning situations, so learning extends beyond the classroom and can provide face to face interaction (Oloruntopa, 2006), using action learning vehicle is based tablet PC, desktop supplement.

Cloud computing platform e-learning environment

The project is divided into Moodle teachers teaching platform (Figure 3) and student self-learning platform Google. Teachers to share and disseminate knowledge, use platform design materials and planning teaching activities. Cloud computing environment will use Google's cloud platform to build a new Google cloud computing platform for learning environment (Fig4).



Figure 3. Teachers teaching platform Moodle

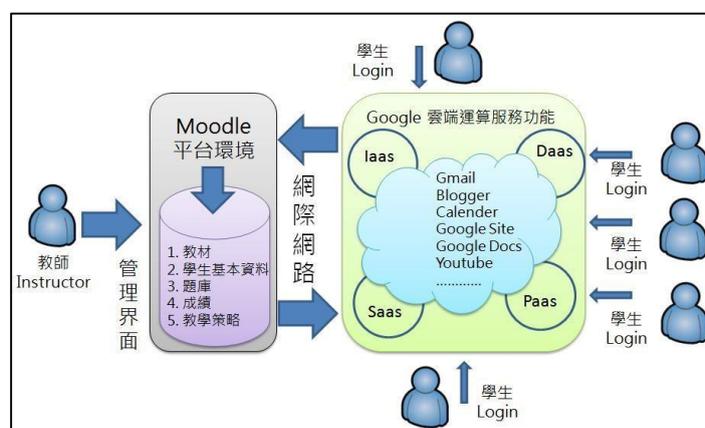


Figure 4. Flip Learning System Architecture

Establish Student learning behavior research framework

This project research framework shown in Figure 5, the contents of each variables as follows: (1) external variables as "environmental" and "teaching material" (2) E-learning motivation affected by external variables, "thereby affecting the" learning effects "and" satisfaction. (3) external variables as factors affecting the motivation of the Internet courses, through literature analysis, there are "practicality", "effectiveness" and other two variables.

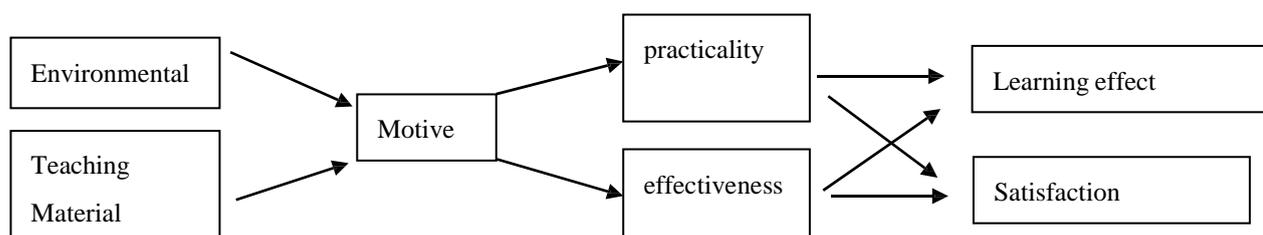


Figure 5. Research framework

System Assessment procedures

The first year of the project plan to build up cloud computing platform E-learning environment prototype, arrange three classes total 150 secondary school students, for a period of 12 weeks of experimental teaching and questionnaire respondents, each class divided into 10 groups, each group has at least three tablet PCs, the assessment procedures as follow: (1) teachers participate in the program should attend at least 18 hours flipping teaching strategies. (2) students and teachers involved in the apply cloud account and explain the procedure. (3) Student groups practice connect the cloud and set their own collaborative learning platform and share with same group of students and teachers. (4) The three teachers were weekly design teaching content and discuss issues related online learning materials to the students' in general E-learning platform and cloud computing platform. (5) The groups discuss in collaboration to answer questions, the mobile devices and Cloud Connect allow teachers to use cooperative learning dialogue text, interventional and guidance. (6) The teachers collaborate weekly observation and assessment of student learning.

THE RESEARCH RESULTS AND DISCUSSION

4-1. Student motivation and environmental facilities vs teaching materials have significant correlation Learning motivation and environment facilities, teaching materials related tables

		Learning motivation	environment facilities	teaching materials
Pearson related	Learning motivation	1.000	.755	.795
	environment facilities	.755	1.000	.788
	teaching materials	.795	.788	1.000
Distinctiveness (one-tailed)	Learning motivation	.	.000	.000
	environment facilities	.000	.	.000
	teaching materials	.000	.000	.
number	Learning motivation	542	542	542
	environment facilities	542	542	542
	teaching materials	542	542	542

From the above table, after three experimental schools through digit environmental facilities, teaching materials design. Conducted a few weeks digits teaching, learning motivation of students from high interactive e-learning platform is significantly elevated.

4-2. student learning outcomes effectiveness, practicability significant correlation

Learning outcomes effectiveness and practicability related tables

Control variable		effectiveness	practicability
effectiveness	related	1.000	.389
	Significant resistance (two-tailed)	.	.000
	df	0	539
Learning outcomes	related	.389	1.000
	Significant resistance (two-tailed)	.000	.
	df	539	0

From above table, affect students' learning motivation two outer factor "practicality", "effectiveness", under high interactive learning platform and digital interactive teaching in the three experimental schools, learning satisfaction is highly significant Related.

4-3. Learning satisfaction and effectiveness , practicability related			
Learning satisfaction and effectiveness , practicability related tables			
Control	variable	effectiveness	practicability
	related	1.000	.347
effectiveness	Significant resistance (two-tailed)	.	.000
	df	0	539
satisfaction	related	.347	1.000
	Significant resistance (two-tailed)	.000	.
	df	539	0

From above table , affect students' learning motivation two outer factor "practicality", "effectiveness", under highly interactive learning platform and digital interactive teaching in the three experimental schools, learning outcomes are highly significant correlation.

Construction flip education of digital teaching mode

Cloud computing processing mode greatly reduce the cost of educational information system construction. Cloud provides a suitable environment for school teaching data center, network center, and other related tasks. Through the IT infrastructure provided by cloud computing , not only reduce the investment to purchase hardware devices, frequent maintenance and upgrade costs; to develop grid computing mode and better management mechanism, high level of automation , network virtualization will achieve the maximization of resource sharing and collaborative environments. Flip education is bound to become an important teaching strategies .

- (1) Increase the teaching digitized materials, amplified resource content.
- (2) Find out the students E- learning behavior.
- (3) Provide students analyze the digital learning behavior curve.
- (4) Understand Flip education effectiveness in situations.
- (5) Training Teachers digital teaching materials editing skills.

CONCLUSION

Recently, the Internet web 2.0 accompanied by a large number of Internet multimedia data, and now most of the campus e-learning platform architecture, are based on a single computer or server to set up the basis of considerations, once the overload or lack of space, should upgrade hardware and software, is a funding burden. In addition, the conventional E- learning platform is package system not flexible, students are condensed to system functions, learning depressed .In the future it might offer different courses Community E- learning materials and curriculum, as a growing number of learners join this architecture, bringing more learning service resources, such as: interactive learning modules, virtual reality-based learning modules, individuals course modules, etc., this platform use environmental resources cloud ,build individual learning entrance with Community mechanism in this study, students can solo Integration into learning portfolio into individual learning entrance, everyone is knowledge creation node, can learn and grow from each other in the learning community.

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