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THINKING ABOUT THE TEACHING MODEL OF "MOBILE NETWORK + INTELLIGENT EQUIPMENT" –TAKING IPAD APPLICATION TEACHING AS AN EXAMPLE

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ABSTRACT

The teaching model of "mobile network & intelligent equipment" is a new teaching model based on the development of mobile internet. On the basis of a comparative study on the application of iPad to teach both in China and abroad, the paper tried to discuss the teaching model of "Mobile Network + Intelligent Equipment" and how to better use this new teaching model.

KEYWORDS: mobile network; intelligent equipment; teaching model; iPad.

INTRODUCTION

With the rapid development of the mobile Internet, all aspects of people life have been deeply affected. School education is also deeply affected. The way people acquire knowledge and information became varied and is no longer restricted by time and space. The students' study is not limited to the school and the teacher's teaching. The mobile internet has brought a new way of education for modern education because of its characteristics of convenience, dynamics and immediacy. Obviously, this innovative way of education extends teaching beyond the classroom. Under the background of rapid development of science and technology, the emergence of new electronic intelligent equipment provides a material basis for the emergence of this new teaching model. Therefore, it is of great significance to study the new teaching model of "Mobile Network + Intelligent Equipment", which is important to the school teaching in the future. It changed the traditional approach of teaching, paid more attention to students learning rather than teachers' teaching in the classroom, and emphasized the training of students' interest in exploring and solving practical problems.

The mobile web refer browser-based web services connect to a public network via mobile devices, such as mobile phones, laptops, or other portable tools. It does not require a desktop computer, and it doesn't have a fixed connection. Intelligent equipment is any kind of device with computing power, which has the characteristics of task migration, intelligent collaboration and multi channel interaction. For example, in recent years, the popular micro-lecture teaching model, MOOC teaching model, flipped classroom teaching model, micro-blogging teaching model, even WeChat teaching model, are all new education models based on "Mobile Network + Intelligent Equipment". iPad, as a new representative intelligent electronic device, contains a lot of learning resources. Under the background of the development of the mobile Internet, it has practical feasibility for building a new teaching classroom.

II. APPLICATION STATUS OF IPAD IN TEACHING:

Concept of Tablet PC was first proposed by Bill Gates of Microsoft Corp in 2002. However, due to the limitations of technology, network and social environment at that time, it has not been widely applied. In January 2010, Apple Inc. announced the release of iPad, which made iPad receive extensive attention. "iPad" is an electronic product between the smart phone and notebook. Its size is larger than that of a smart phone, smaller than that of a notebook. iPad can connect to the Internet, browse web pages, send e-mail, watch videos, listen to music, take pictures and many other functions.

In the first two years of iPad release, the academic research is only theoretical, and the application fields are relatively narrow. Nevertheless, with the passage of time, the research and application field of iPad becomes more and more extensive. In the United States, teaching experiments on iPad covered almost every school age. Scottsdale's Kindergarten in Arizona turned empty classrooms into a laboratory by using 36 iPads and named "Fantasy Show", which has become the core area of the school. As the headmaster of the school said, "among all equipment, iPad is the most film-star glamour for the child." Roslyn High School in the United States tried to replace textbooks with iPad in 2012. They sent iPad for teachers and students in school humanity classes for use in class time and after school. In early 2013, more than 2200 tablet computers were assigned to pupils from grade 1 to grade four in Charlotte, North Carolina. In Australia's institutions of higher education, one aspect of educational reform is the release of a tablet computer as a new tool for education. Professor Robert Hill, executive director of the Academy of Sciences at Adelaide University, said, "I think iPad will bring the reform of college science teaching methods. Adelaide University will be the first university in Australia to teach science courses by using iPad, and is also a university that provides the largest number of iPad for students in the world". In January 2011, Nanyang Girls' High School also carries out the iPad demonstration class. The school bought 150 iPads for some students to be used in class. Students can use iPad to surf the Internet, download books and course, and even take notes on iPad. Seah Hui Yong, Director of the Academic Affairs Office, said that compared with the traditional classroom teaching, the use of iPad in class can give students more freedom, giving them the opportunity to learn autonomously instead of relying entirely on teachers. In 2012, Education Committee of Osaka in Japan decided to issue the tablet computer for the teaching of primary and secondary school. According to the plan, this move will give out about 400 tablet computers to students from grade 3 of primary school to grade 3 in junior middle school in 2013 and 2014. Yingla, the Prime Minister of Thailand, made a promise of "one child, one flat" during the election campaign. In order to fulfill this commitment, the Thailand government purchased a number of tablet computers in 2012, and plans to popularize WiFi in many schools across the country in 2013 to support the plan of "one child, one tablet". At present, more and more countries, including the United States, Britain, Australia, Singapore, Japan and Thailand, are preparing or already applying iPad to teach.

With the more and more extensive application of iPad in teaching, technology is becoming more and more mature. The experiment and research of iPad in the field of education are also being conducted in China, which are involved in every school age from primary and secondary school.

According to the existing research results, application research of iPad in the teaching discipline involved various stages from kindergarten to university, mainly including preschool education, primary Chinese, middle school mathematics, geography, history, biology, chemistry, multimedia teaching, moral education, special education, general education, etc.

From the situation of practical application, Kirin Primary Department of Nanshan Experimental School in Shenzhen has tried to use iPad for teaching in 2010 [13]. In 2012, Beijing's Baijiazhuang elementary school also began to use iPad in the teaching of various subjects, such as English, mathematics, art, music and so on. Before class, the teacher will give iPad to the students, and utilize iPad to teach in the next class.

In September 2011, students from the Jiangxi City College got 5000 S7 Silm tablet computers offered free of charge by HUAWEI. The company will work together with Jiangxi Unicom to provide a customized industry solution to the institute and help it to establish an "Information University". In October 2011, Zhiyuan College of Shanghai Jiao Tong University was equipped with 200 tablet PC for students. Every teaching reference books of each course has been automatically pushed to the terminal by e-book form for the students learning. Students of two Experimental Class of experimental primary school in Jiading District in Shanghai can use iPad for classes and exercises [14]. In 2011, high school in Hangzhou also planned to introduce the tablet computer into the teaching of high school class in order to realize the goal of reducing the students' burden.

III. COMPARISONS OF THE APPLICATION OF IPAD IN TEACHING IN CHINA AND FOREIGN COUNTRIES:

A. Common points of applying iPad to teach in China and foreign countries

a. Supporting and opposing voices coexist

Emergence of a new kind of thing is often accompanied by Supporting and opposing voices, and the application of iPad to teaching is no exception. Whether in China or other countries, People who support the use of iPad in teaching generally think: iPad is not only small, thin and light, but its function is very powerful. If the tablet computer can be used within the classroom, it can make the content of the teaching more colorful. Obviously, this approach can attract the students' attention. At the same time, the students are in a period of growth and development. The application of new teaching tools can arouse the students' interest in inquiry to better grasp the new knowledge. However, opponents argued because students' self-control ability is relatively poor, and their physical and mental development is not yet mature, the application of iPad will make students indulge in content that has nothing to do with learning and fall into the Internet without realizing it. Meanwhile, electronic products like iPad can not only cause the decline of students' writing ability and visual acuity, but also hinder the development of students' thinking. Another part of opponents thinks if iPad is applied to teaching, so must invest a lot of money in early stage, including the construction of the school’s wireless network and iPad purchase costs. After the iPad is put into teaching, how to protect it from being damaged and stolen is also a big problem. Larry Cuban, Honorary professor of Education at Stanford University, said there was little evidence that students can learn more, faster, or better

through these devices. Although iPad is a great tool for attracting students, it is still the core issue of teaching and learning after freshness.

b. Involving every school age

In some countries, iPad is applied to teaching from kindergarten to university. In kindergarten, iPad is usually used by teachers as a tool for playing games. In primary and secondary schools, the use of the tablet computer is widely, and the most common usage is as e-Schoolbag. Teachers will use iPad's existing programs or import new e-textbooks to teach, so that it can avoid students take many paper textbooks to class, thus the burden of students is relieved. Other uses are mainly assignments, doing exercises, downloading course, and so on. Although the use of iPad in universities is also varied, the fundamental purpose is the same, which is towards the direction of "Information University". At present, the introduction of iPad into kindergartens is relatively scarce in China. However, in primary and secondary schools in China, this phenomenon is very common, and iPad's application is similar to that in other countries. The application of iPad in universities is also alike in China and other countries.

c. Popularized in the form of point to surface

Popularizing form from "point" to "surface" refers to a pilot experiment based on one or several schools, and then a comprehensive popularizing is conducted according to the situation of the pilot. The Osaka city of Japan adopted this model. They tested some students from seven to eight primary and secondary schools in the city. Throughout the experiment, problems were constantly discovered and solved to optimize this teaching model, and then popularized it. Beijing, Hangzhou, Shenzhen and other cities in China also adopted this method. The advantage of this method is it can save manpower, material and financial resources to give full play to the greatest role of iPad during teachings.

B. Different points about the iPad's teaching application in China and other countries

a. Different types of iPad applications

In China, the application and research of iPad principally focus on the primary and secondary school classes, which chiefly involves mathematics, Chinese, English, art and music. From the existing research literature, although the scope of the study is wide, these are only in the field of theoretical research level, and have not been really implemented. Taking geography at middle school as an example, most literature only analyses the feasibility of introducing iPad into class, or conduct an instructional design for a certain point of knowledge, but there is a little practice in classroom teaching. Moreover, these literatures are only designed for a knowledge point or a course, and there is no study for the whole book. Therefore, systematic process and method have not been formed on the whole. In other countries, iPad not only was applied to traditional discipline teaching, such as history, geography, language, but also involved various kinds of teaching, such as medicine, management, and so on.

b. Different teaching environment, different popularizing difficulty

It is undeniable fact that the teaching environment in China and abroad is different. Most schools in other countries carry out an open teaching model. Students' learning is relatively autonomous. In the classroom, they mainly discuss and explore. This way of learning and teaching model is very suitable for introducing iPad into the classroom. iPad, as a new teaching tool, can help students gain more knowledge. Compared to other countries, most of the classroom teaching is completed by the teachers. Although there is some discussion and practice course, the proportion of these courses in total course is not high. As a result, the difficulty of iPad introduced into the classroom is virtually increased. At the same time because China has a vast territory, large population, a different level of economic development in a different region, different number of students in different areas, and extremely uneven of the hardware, software, and teachers, it also makes the popularizing of iPad teaching becomes more difficult.

c. Differences in equipment and technical means

In order to introduce iPad in the course of teaching, it must be supported by certain funds, equipment and technical means. In terms of capital and equipment, buying iPad as a teaching tool requires a lot of money. At the same time, use of iPad needs strong network support. If we want to introduce iPad into the classroom, we will make the campus network full coverage, which requires more powerful equipment support, and the purchase of these devices will require a lot of money. Problem is who should pay off the cost? On the other hand, the mobile Internet technology started from outside of China, and has developed for a long time. However, China accessed to the Internet relatively late, though in recent years, the internet developed rapidly, there is still a certain gap between China and some countries. In addition, the development of electronic textbooks in China is rather late, and the development is not very mature. Many disciplines do not have matching electronic textbooks. Compared with some developed countries, there is still a gap.

IV. THINKING ABOUT THE TEACHING MODEL OF "MOBILE NETWORK + INTELLIGENT EQUIPMENT":

At present, both China and other countries have seen the fair prospects of the application of iPad in the teaching, and have already had preliminary research and practice. However, in the process of practice, there are still numerous problems, such as capital, equipment, technology, talent, and so on. From the pilot popularizing of iPad teaching model, it can be seen that the new teaching model of "Mobile network + Intelligent device" has a great potential. It will have a huge impact on the reform of education and teaching. However, how to better apply this model to classroom teaching is worth considering deeply.

A. Vigorously develop professional resources that can be used in teaching

Teaching model of "Mobile Network + Intelligent Equipment" is built upon the development of mobile internet. In fact, whether the flipped classroom teaching, micro-lectures teaching, or iPad teaching, intelligent equipment is needed to play the related videos, audio, courseware or electronic textbooks. These videos, audios, courseware or electronic textbooks must be targeted, systematic and suitable for classroom teaching, rather than simply list the scattered data collected on the Internet. Otherwise, it only adds a new

tool for the traditional classroom teaching, but it doesn't play any role in fact, and even destroys the traditional teaching model. In terms of digital resources, some publishing houses have begun researching and developing corresponding e-textbooks, but their development speed and scale are far from the requirements of existing practice. In order to solve the problem of lack of professional resources, the strength of development needs to be increased on the basis of systematic planning. California has developed a complete implementation phase and step (Table 1) in the implementation of electronic textbooks, which are worthy of reference.

Table 1 Implementation stage of the electronic textbook program in California, USA [16]

Stage	Proceeding
1st stage	1. Teaching material suppliers apply for electronic materials of high school mathematics and Science at high school. 2. Before the application is completed, the government-appointed agencies review whether teaching materials meet the educational standards. 3. Release the review results. 4. Review qualified electronic textbooks for selective use of school districts.
2nd stage	1.Teaching materials' suppliers apply for electronic teaching materials for History, Social Sciences and Advanced Mathematics courses of high school. 2. Audit takes the form of rolling, no deadline for the application. 3. Release the results of the audit. 4. Teaching materials in accordance with the standards are selected by school districts, schools and teachers.

In fact, no matter the video production of the micro-lectures teaching or the production of electronic textbooks in iPad teaching, the way of implementing electronic textbooks in California is worthy of reference. We can call textbook providers to make targeted, systematic, and teaching resources, and then combine the resources with intelligent devices for teaching after the audit. In this way, we have both professional electronic teaching resources, and also speed up the strength and depth of the resources' development.

B. Strengthening the support of funds, technology and talent

"Mobile Internet + Intelligent Device" teaching model relies on mobile internet technology and intelligent electronic devices. The key of supporting these two parts is the funds that purchase technology and equipment and the talents with technology and equipment. However, whether it takes a large fee to buy smart devices or to popularize the mobile network, who will be responsible for the cost? It's a big problem now. At the same time, if this new teaching model is adopted, it must have a strong platform as a support. This platform can not only control students' learning progress in time, but also carry out effective classroom management. However, as far as some auxiliary teaching platforms are concerned, it is far from this requirement.

Table 2 is the source of funds, which purchases iPad devices in some countries. From Table 2, it can be seen that the funds used to buy iPad equipment are mainly from the four aspects: school, school district,

government and parents. For the new teaching model of "mobile internet + intelligent device", the capital problem can be solved by using the above operation model. School, school district, government and parents should be considered at the same time. However, the actual situation of China should also be taken account, and the main contributor to the funds should be implemented. For talents and technology, the model of joint training between primary and secondary school and university can be adopted. By training corresponding professional talents and developing corresponding technology platform, colleges and universities will gradually enter partner schools.

Table 2 Sources of funding for iPad projects in some countries

Source of funds	Specific model
School	iPad equipment issued by the teacher to the students in class (purchased by school alone).
School and school district	Schools applied for the financial subsidy from the school district, and the iPad equipment is purchased jointly by the school and the school district.
Government Education Department	Ministry of Education has set up a special iPad project fund for the implementation of iPad project.
Parent	iPad equipment purchased by parents for students to learn and use in the class.

C. Building a complete road map before implementation

Implementation of a novel teaching model is bound to develop a complete road map, which should include four aspects: planning, preparation, implementation and evaluation. In the planning stage, it should take into account from all directions and angles. In the preparation stage, whether people, money and materials are ready should be considered. In the implementation stage, good relevant records should be made, so that follow-up assessment can be carried out smoothly. In the evaluation stage, the evaluation approach should be considered, for example, evaluating the processes or the results.

Figure 1 is a complete plan for the one-to-one digital learning project in Australia's "iPad for learning" project, which can provide a useful reference to the "Mobile Network + Intelligent Equipment" education model. The new teaching model of "Mobile Network + Intelligent Equipment" can also use this method to create a complete road map, including funds, technology, talent, platform, and so on.

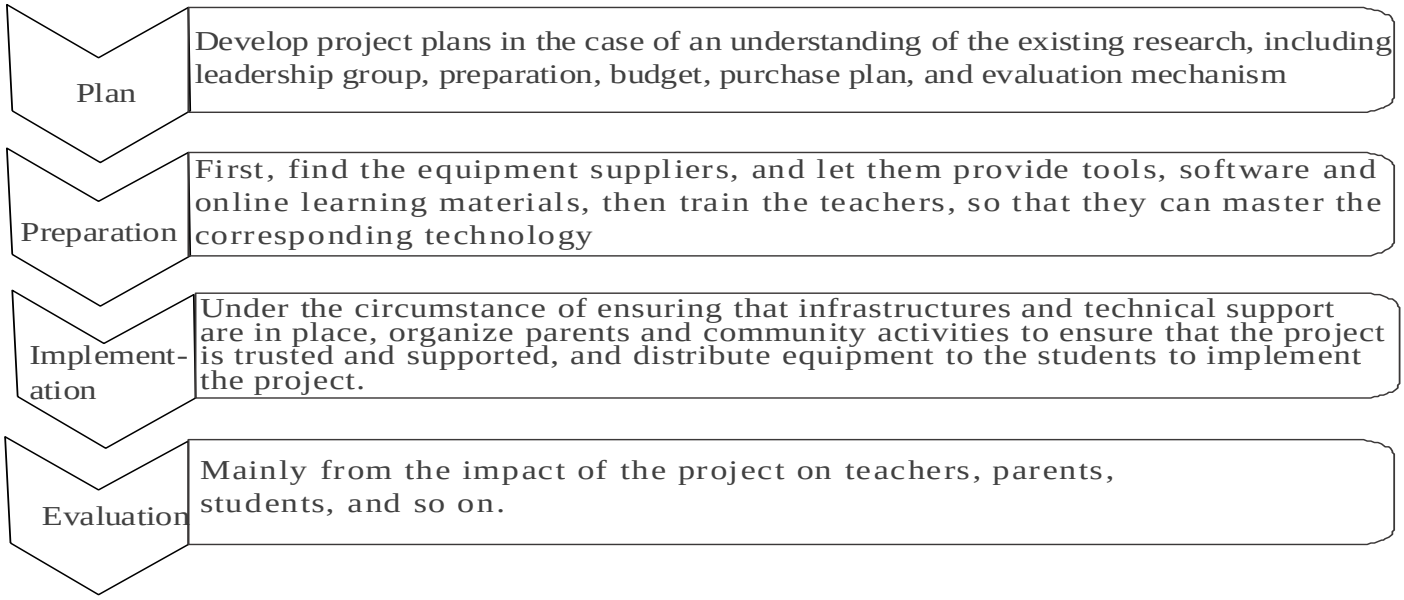

Fig. 1 Digital learning roadmap of the project of Australia's "iPad for learning"]

V. CONCLUSION AND DISCUSSION:

In the current situation, this new teaching model based on the mobile internet and intelligent devices have attracted wide attention. Many schools and regions have gradually increased their teaching practice in this field. However, on the whole, the development of this new teaching model is faced with some problems urgently needed to be solved, mainly including the development of professional teaching resources under the environment of mobile internet, the training of technical talents to carry out brand new teaching models in school teaching and the source of funds for purchasing and maintaining intelligent equipment. Therefore, how to develop, how to cultivate and how to build this teaching model to apply the subject teaching is a problem we need to think seriously.

The teaching model of "Mobile network + Intelligent device" has a bright future, and may even become the main form of school teaching in the future. The development of information technology and media equipment is a catalyst for the reform of teaching methods. Using modern high technology to assist teaching is an important supplement to traditional teaching form [18]. Therefore, how to make use of new teaching tools and develop a new teaching model will take a long time to explore. It not only needs the research of the experts and scholars, but also needs the first-line educators' personal practice. On the basis of research and practice, the country can learn from the relevant experience of other countries to find out and solve the problems in combination with their own national conditions to explore a more suitable way for the teaching model of "Mobile Network + Intelligent Equipment".

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