The Value of Modern Educational Technology to Construct a New Teaching Model

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Abstract — The essence of education is to cultivate talents of innovative ability and the noble moral spirit. To achieve the goal, the modern education technology which have the important role cannot be ignored. Chinese traditional teaching mode is mostly based on the theory of behaviorism which emphasizes the students passively accept knowledge, without the sense of innovation. To cultivate creative ability, to gain the growth of talent, we must change the traditional teacher-centered teaching mode. We should pay more attention to student’s cognitive ability than teachers’ leading role under new teaching mode. Modern teaching media based on computer can provide ideal state for the construction of the new teaching mode under new teaching environment. Teaching design theory of modern education technology provides a solid theoretical basis for the construction of the new teaching mode.

Keywords - education; modern education technology; teaching model

I. INTRODUCTION

Modern educational technology has a vital significance cultivate a new generation of innovative capability and high moral spirit to adapt to the 21st century. This is not only because of the cultural foundation in the information society contains the knowledge and capabilities of information while information knowledge and ability obviously depends on the technical means of modern education, but also because of the various disciplines are inseparable from the support of the guidance of the theory of educational technology and computer-based teaching and learning environment to deepen the reform of teaching. As mentioned above, the essence of the education is to cultivate talents with innovative ability and high moral spirit and modern educational technology have important role to achieve the educational goals, in particular for the cultivation of innovation ability. This can be explained from the following four aspects.

II. THE MAIN PROBLEMS

A. Teaching Reform

Over the years, the teaching reform in China has made many achievements, but generally speaking, there is no major breakthrough. The main problem is that these education reform focus more attention to the content, the means and methods of reform than the reform of the teaching mode. Since the reform and opening up, we made up a lot of new teaching materials, teaching content and each school has added a lot of equipment. These reforms are needed to promote the teaching reform. Though we put a lot of manpower and material resources to carry out such reform, but they ignore a more fundamental reform, the reform of the teaching mode.

As we all know, the traditional teaching system is composed of three elements of teachers, students, and teaching materials. Modern teaching environment even more increase of a factor, which is teaching media. Since it is a teaching system, from the viewpoint of the system, these several elements is not simply isolated to pieces together, but interrelated, interact to form an organic whole. The so-called teaching model is these four elements to form a stable structure in the process of interaction and teaching activities, four elements interrelated, a concrete manifestation of the interaction.

Over the years, the teacher-centered teaching mode rules our schools at all levels, for example, it is characterized by teachers through lectures, writing on the blackboard, and instructional media auxiliary, teaching content is passed on to the student. The teacher is a master of the entire teaching process, and students in a passive acceptance of the status of teachers impart knowledge. In this mode, the teacher is the initiative by the teaching, students are passive external stimulus recipients, media auxiliary tool for teachers to instil in students textbook indoctrination. Whether the arts, science, mathematics, physics and chemistry, or language, history, geography, are all abide to teacher-centered teaching mode in which four elements (teachers, students, teaching materials, media) have a stable structure.

The five sections teaching of Kairov is the typical representative of teacher-centered teaching mode which is came from the Soviet Union. Its advantages is conducive to teachers' leading role in the play, is conducive to the organization of the teachers in the classroom teaching, management and control; but there are a lot of defects, such as ignoring the initiative and creativity of the students and the student's cognitive subject role is not well reflected.

It is not difficult to imagine that the students as a cognitive subject is always in a passive position in the entire teaching process, and certainly difficult to achieve the ideal teaching effect, impossible to cultivate creative talent, this is the biggest drawback of the traditional mode of teaching. But over the years this model has not been challenged, in 1993-94 years, Beijing Agricultural University affiliated high school reportedly engaged in a pilot research project called “main participatory classroom teaching mode”, which is the
traditional teaching mode without a computer to study how to make students more motivated to participate in teaching process. This is earlier exploration on teaching mode. We emphasize that the reform of the teaching mode, not means we will abandon other aspects of the reform, such as content, means, methods reform. But if the pattern does not change, even if the content, means, methods change then advanced, it is still inevitable wear new shoes take the old roads, there will be no breakthrough. Over the years, this did not cause much attention of the education sector. This situation gradually has changed in the past two years, but from the national point of view, the reform of the teaching mode is still sporadic, small-scale, not as before we have a grand national point of view, the reform of the teaching mode is much attention of the education sector. This situation will be no breakthrough. Over the years, this did not cause is still inevitable wear new shoes take the old roads, there even if the content, means, methods change then advanced, it means, methods reform. But if the pattern does not change, emphasize that the reform of the teaching mode, not means process. This is earlier exploration on teaching mode. We to make students more motivated to participate in teaching traditional teaching mode without a computer to study how “three stages” of Chairman Mao in “On Practice” and “leap” cognitive processes), and are based on rational knowledge generally called “special understanding” (process of classroom activities carefully designed into nine stages. In order to make the teaching and learning activities to promote meaningful learning, his process of classroom activities carefully designed into nine specific steps to adapt with the learning process in cognitive psychology activities have a positive impact on learners psychological process, which is the famous “Gagne the Kudan teaching program. We Gagne attitude is serious (Silverman, 2003), scientific research methods used, and the essence of his teaching process and analysis is in line with objective reality. The other hand, our domestic education theorists, have been published so far on the “Education Introduction” and “teaching theory” kind of textbooks or monographs in vast majority regard the teaching process is generally called “special understanding” (process of understanding in the education sector is usually regarded as cognitive processes), and are based on rational knowledge “three stages” of Chairman Mao in “On Practice” and “leap” point of view on this particular understanding of the process to be discussed in detail. As mentioned above, teaching is a contradiction, there are two sides of the “teaching” and “learning”. From this side of “learning”, learning activities are primarily cognitive activities (also includes emotional, emotional activity), so the learning process can also be referred to as a cognitive process; “teach” this side, it’s just a species affect the learner internal mental processes external stimulus, is a condition that affects the learning process external conditions or “external factors”, also known as cognitive processes such external conditions or external factors or understanding of the process is appropriate? Obviously, the formulation of science should be “learning” as a cognitive process, “teach” as is “learning” an external influence and promote conditions. The practice of “teaching” and “learning” together the two systems called cognitive process or understanding of the process is not desirable. Marxist epistemology only as the guiding ideology and not a substitute for specific scientific field research.

Unfortunately, some comrades in our education sector is precisely on this issue out of the deviation, error epistemological principles and conclusions replace of specific cognitive regular teaching process. In this way, it will inevitably illegible nature of the teaching process, cannot see the “teacher-centered teaching mode hazards, and thus, despite this model the long reign of schools at all levels of classroom, never to be critical, but did not think of the need to reform, it is not surprising.The second misunderstanding is not for in-depth study, but simply copying foreign ready-made conclusions on this important concept in the teaching mode.

In many textbooks on the Principles of “education” and “teaching theory” or monograph, defined on the teaching mode are usually a direct reference to the United States Joe Adams and Will, published in 1972, “Models of Teaching” (teaching mode ), a book's point of view. The book teaching mode is defined as “a plan that can be used to set the course, the design of instructional materials to guide classroom or other occasions teaching or paradigm. According to this definition, the teaching mode is just a planning guide classroom teaching or other occasions teaching or paradigm (that is representative of a certain role model teaching methods and instructional programs). In this way, put the teaching mode is actually assigned to the areas of teaching methods or teaching strategies. This is because, according to the interpretation of the “Modern Chinese Dictionary”, “strategy” refers to the guidelines for action and the way of work, method. Method, as we all know, is the plan to solve the problem, tips and program. Domestic education sector there is a very popular saying jujube “teaching method is a small way, teaching mode method”, its roots cover for this. Since teaching mode and teaching strategies, methods belong to the same category, is not essentially different, so what's necessary to put it as an important reform goal singled out? However, as mentioned earlier, from the point of view of system theory, teaching mode should refer to the four elements interrelated in certain educational ideas, teaching concepts, teaching and learning theory, under the guidance of the teaching system, the interaction of specific reflected. Teaching model reflects the dynamic characteristics of the
entire teaching system in the process of teaching and learning activities, and overall, comprehensive features, rather than one or two elements of the characteristics, teaching methods and strategies is reflected in one of the teaching system has the characteristics of the elements (such as teachers or textbooks), and often static characteristics (such as textbooks organizational strategy is a static characteristic). So we think there is a difference in principle between teaching mode and teaching strategies, methods, and they are not the same level (teaching mode is deeper) concept of the same category, this confuse the two theoretically untenable foreign authority have said if not necessarily correct.

C. The Serious Consequences of the Ignoring of the Teaching Mode Reform

Theory of China's education sector precisely because the existence of the two misunderstandings, so the problem of teaching mode has not been given enough attention, teaching reform also has not been able to grasp the fundamental goal they have been unable to hit home, this is many years to the main reason for the teaching reform done a lot of work, but no major breakthrough. To this end, our country, our nation had to pay a heavy price jujube long reign of schools at all levels of classroom teacher-centered teaching mode for decades, thus inhibiting our generations of innovative ideas and innovation ability of the growth of creative talent.

This conclusion is arbitrary? Alarmist? No, this is an entirely consistent with the logic of things scientific conclusions. This is because the teacher-centered teaching mode based on behaviorism in psychology. This teaching mode long reign of schools at all levels of classroom behaviorist learning theory ingrained in our schools at all levels. As we all know, behaviorist the school advocates psychology study only explicit acts against the study of consciousness and internal psychological processes. Their individual behavior comes down to the individual to adapt to the external environment of the reaction system, the so-called "stimulus - response system, learning the cause is considered to be a reaction to external stimuli, but they do not care about the internal psychological processes that learning and internal stimulus regardless of the mental process, so long as the control stimulus will be able to control the behavior and predict behavior, which also will be able to control and predict the learning effect. This is basic behavioral learning theory perspective. According to this view, the human learning process is interpreted as passively accept external stimuli, and the teachers' task is just to provide an external stimulus, to immediately impart knowledge of students task is to accept external stimuli, teachers impart the knowledge to understand and absorb. due to China's education theorists epistemology replaced in the process of teaching study of cognitive rules, cause the vast majority of primary and secondary school teachers do not understand the law of human cognitive learning process, are not familiar with or even fully understand the cognitive learning theory, which opens the door for behaviorism, behaviorist learning theory especially prevalent in our country. still many schools emphasize student's task is to digest and understand the content of the teacher taught the students as objects of indoctrination, receptor of external stimuli, the memory of previous knowledge and experience, forget the students initiative, creative thinking, living people. due to the subtle influence of the long-term behavior theory, the vast majority of our students gradually develop a love does not ask do not want to ask "why", do not know to ask "Why "numbness habits, and the formation of an idolatrous superstition of books and teachers: books are classic, the teacher must be correct, are not suspected of books and teachers. “Such ideas passed on from generation to generation, continue to strengthen the students divergent thinking, reverse thinking shackles, was being detained, the courage to break through the traditional contempt for the authority of the new ideas, new concepts are denigrating, strangle bold fantasy wings are broken, unable to play as the of Cognitive main student initiative. Tantamount to be removed from the substrate on which nurture innovative thinking and ability to innovate talent, soil, breeding and growth of the culture of creative talent into difficult to achieve castles in the air. Fact, there are already many people of insight to see through the comparison of the different characteristics of the Chinese and American students, this harsh fact. example, they pointed out that the American students in the class can be arbitrarily interrupted by the teacher lectures, presented its own problems and different points of view; in our country, unless the teacher to ask questions or cannot students are expected to do so the students must dare to do so. As a result, the Chinese students, graduate students, and the United States similar students compared to the overall creative thinking, creative ability was not as good as the other. Comrade Jiang Zemin pointed out in a speech on February 14 this year: "Innovation is the soul of a nation's progress, is an inexhaustible motive force for national prosperity. This is a national innovation capability is difficult to stand in the advanced nations of the world, "but our education students generally lack of innovative thinking, the ability to innovate, and difficult to adapt to the needs of the 21st century dates Over the years we ignore teaching mode reform caused serious consequences, but also the heavy price we pay for education science theoretical research into errors.

III. CURRENT MAIN GOAL

Based on the above analysis, we believe that, in order to promote the deepening reform of China's education, in order to facilitate innovation and growth of the capacity of human resources, must clearly understand the nature of the teaching process, advanced education and guidance of scientific theories, to change the traditional teacher- centered teaching model, constructed both to play the leading role of teachers (in primary and secondary school teachers is necessary to play a leading role in the higher education stage will be teachers "leading role" to the "guiding role" to more appropriate) and new teaching model can fully reflect the students' cognitive main role, the main objective of deepening reform in schools at all levels as the current. The shortcomings of the traditional teaching mode, and does not claim rights to play the leading role of teachers, and
the leading role of teachers is to arbitrarily exaggerated and absolute. Teaching process in order to achieve optimal, so that students get the best learning results, the leading role of teachers (or guiding role) is essential dates in particular, especially in the primary and secondary schools. Construction of the new teaching mode should never lose sight of the one-sided emphasis on student-centered, completely to allow students the freedom to explore and neglect of teachers (or even ignore the textbook) role and went to the other extreme, dates, like some of the current foreign extreme constructivism advocated (Guifen, 2011), this one-sided from the outset, should be avoided. At the same time, taking into account the decades, after all, is ruled classroom, teacher-centered teaching mode to dominate the whole process of teaching and learning activities by teachers and students in the passive position has become the habits and practices of the traditional teaching, so teaching reform, stressed the need to play to the initiative of the students to fully embody the main role of the students, and even proposed should be guided by the constructivist theory (constructivism advocated under the guidance of teachers to student-centered learning) to establish a new type of teaching more mode, we believe that it is absolutely necessary for the impact of this for many years a teacher-centered one-sidedness (only see one side of the teachers teach this contradiction of the teaching process, while ignoring the "learning" this other side), and critical mechanical "external factors" (only attach importance to external stimuli provided by the teachers, and ignore the internal mental processes of the students) are a lot of good. In other words, the current construction of the core of the new teaching model (or current deepen teaching reform key) is that, and how to give full play to the initiative of the students in the learning process, enthusiasm and creativity of the students in the learning process truly become information processing passive recipients of the main active construction of meaning, rather than external stimulation and knowledge instilled object; teachers should become the organizers of the classroom teaching, guidance, help students construct meaning, facilitator, rather than knowledge indoctrination and the master of the classroom. To achieve the above education reform goal decidedly cannot do without the support of modern educational technology, from the characteristics of the modern teaching media (media characteristics and application is one of the main contents of the Educational Technology) with these two aspects of the theory of modern education technology to be demonstrated.

IV. AN IDEAL TEACHING ENVIRONMENT

Modern computer-based instructional media refers to a multimedia computer classroom network, campus network and the Internet (Internet). As new teaching media, they have the following five for education, the teaching process is extremely valuable feature for the Construction of the new teaching model to provide the best teaching and learning environment.

A. Multimedia Computer Interaction Help to Stimulate Students' Interest in Learning and Cognitive

HCI is a notable feature of the computer, and any other media. Multimedia computer further TV has audio-visual functions in one computer interactive features combine to produce a new illustrated a variety of human-computer interaction, and immediate feedback. Such an interactive way for the teaching process is important, it can effectively stimulate students' interest in learning, to enable students to have a strong desire to learn, to form the motivation.

In addition, this interaction will also help students play the main role of cognition. As mentioned above, in the traditional process of teaching all dominated by teachers: teaching content, teaching strategies, teaching methods, teaching steps and even prior arrangements the exercises are teachers of students do good, the students can only passively involved in this process . Interactive learning environment for middle school students in this multimedia computer in accordance with the basis of their own learning, interest in learning to choose to learn and suitable for their level of practice; teaching software compiled better, even teaching strategies can also choose For example, individualized teaching strategies can also be discussed with negotiation strategies. That is to say, the students in this interactive teaching environment possible with the active participation, and not all listen to the teachers at the mercy, the students can only passively accept. Given in accordance with the point of view of the theory of cognitive learning, human knowledge is not an external stimulus directly, but rather the product of the interaction of external stimuli and internal mental process. External stimulation is needed for effective cognitive, but still play a decisive role internal psychological processes. Must play the principal of the high school students is the perception of the teaching process, students' initiative, enthusiasm, in order to obtain effective cognitive, this active participation in student initiative, active play created good conditions, so that the students can truly reflect the main role of cognition.

B. Multimedia Computer is Conducive to the Acquisition and Maintain of Knowledge Through Diversity External Stimuli

External stimulus provided by the multimedia computer is not a single stimulus, but a variety of sensory stimulation. For knowledge acquisition and maintain, are very important. Experimental psychologist Chek Rui Tela (Treichier) for over two well-known psychological experiment, one source of access to information about human, that human beings get information mainly through avenues. He confirmed by a large number of experiments: the human acquired 83% from the visual, 11% from the hearing, the two add up there is 94%. 3.5% from the sense of smell, and 1.5% from tactile, and 1% from the taste. Multimedia technology can not only visible, but also audible, and can be operated by hand. So through a variety of sensory stimulation for the amount of information that is much stronger than a single teacher to listen to lectures. Information and knowledge are closely related, and get a lot of information you can acquire more
knowledge. He also made another experiment, the persistence experimental knowledge to keep that memory. Result is this: people can remember their reading content of 10%, they are hearing the content of 20%, own 30% of the content see, hear and see the content of 50%, and in exchange process said 70% of the content. That is to say, if you can not only hear but also see through discussion, exchange of knowledge retention is much better than in their own language to express the effect of traditional teaching. This multimedia computer used in the teaching process is not only very conducive to the acquisition of knowledge, but also very conducive to the retention of knowledge.

C. Multimedia Hypertext System Characteristics to Achieve the Most Effective Organization and Management of Teaching Information

Hypertext (Hypertext) is in accordance with the human brain's associative way of thinking, to organize the management of an advanced information technology network structure nonlinear. If management is not only the text, but also contain graphics, animation, images, sound, video and other media information, it would become a hypermedia system, in other words, hypermedia is multimedia and hypertext. In fact, almost all multimedia systems are based on the hypertext information organization and management. Usually hypermedia systems and multimedia systems without distinction, that hypertext is seen as an inherent characteristic of the multimedia system.

Hypertext organization a book, and traditional file or printed books entirely different when the body (article, paragraph, or sentence, word) between the organization into a body network. The first page and the last page of this book does not matter, the segment body from which to start reading, as well as next read by the reader wishes to decide. Select the next section body not based on the order, nor is an index, but the semantic link between the bodies. Cognitive psychology studies have shown that the human thinking with Lenovo characteristics. In the process of reading or thinking problems frequently Lenovo transfer from a concept or theme to another concept or theme. Therefore, according to the non-linearity of hypertext, the network structure of the organization of information and text traditional linear order structural organization of management information compared, the former is more in line with the human characteristics of thinking and reading habits.

The reason why hypertext having the above advantages are decided by their structural characteristics, the basic structure of the hypertext by the node (node) and a chain (link). Node is used for storing various information, the node content can be text, audio, graphics, animation, images, or a period of moving images, the node size can be a window can also be contained in the data in one or several frames; the chain is used to The association between each node (i.e. various kinds of information). Have a variety of different types of nodes and links resulting in a variety of multimedia system.

D. Computer Network Characteristics Conducive to Collaborative Learning to Cultivate A Spirit of Cooperation and to Promote the Development of Advanced Cognitive Abilities

Traditional CAI only emphasized individualized instruction, individualized teaching strategies to help students develop their initiative and varies from person to person guidance undoubtedly is good, but with the development of cognitive learning theory research, it was found that only emphasizes individualized not enough to learn the advanced cognitive abilities occasions (such as solving difficult problems or require complex problem analysis, synthesis, evaluation occasions), the use of collaboration (Collaboration) teaching strategy can often achieve a multiplier effect, and therefore more to be effective.

The so-called collaborative teaching strategies require multiple learners using a variety of different perspectives on the same issue comprehensive observation and comparison and analysis, in order to brainstorm. This is not only for the problems deepen understanding and knowledge to master the use of great benefit, and the development of advanced cognitive abilities, also have a significant role in promoting the formation of the cultivation of the spirit of cooperation and good interpersonal Thus, collaborative learning is based on a computer network increasingly subject to international research and concern of a growing number of educators. In Internet-based education network, collaborative teaching strategies competitive, collaborative partners and role-playing a variety of different forms. Collaborative embodies network characteristics most conducive to a teaching strategy for the 21st century with new personnel training, currently around the exploration of collaborative teaching strategies, has become an international computer network on a hot research topic in the field of education.

E. Hypertext Features and a Combination of Network Characteristics Conducive to Cultivate the Spirit of Innovation and Discovery Learning to Promote the Development of Information Capacity

As mentioned earlier, innovation and information (including information acquisition, information analysis and information processing capability) is the ability and quality of the information society required a new type of human resources necessary to have two important. Specific training needs of both ability and quality, with higher requirements for teaching and learning environment supported of the multimedia hypertext features with a combination of network characteristics, just to create the ideal environment for both the ability and quality culture. As we all know, the Internet (Internet) is the world's largest knowledge base repository, it has the most extensive information resources and knowledge base and repository are organized hypertext structure in accordance with the characteristics of human associative thinking, which is particularly suitable in the students' self-discovery, self-exploration "learning, which provides a fertile ground for students divergent thinking, creative thinking, development and innovation capability gestation.
At the same time, have the opportunity to students from small Internet this ocean of information, the freedom to explore and found, and get a lot of information, analysis, evaluation, preferably, and further processing, and then according to their own needs to be fully use, obviously, in the process of high school students will surely be the best way to learn and exercise on the ability of information, which can grow up quickly for both highly innovative spirit and have a strong information capacity of new talent to meet the needs of the 21st century.

Based on the above five areas of analysis, the modern computer-based media does have a variety of valuable features to optimize the educational process of teaching, epitomizes these characteristics is to give full play to the initiative and creativity of the students, which the students' ability to innovate and information ability to create the best possible teaching and learning environment, and this environment it is essential to construct a new teaching model.

V. CONCLUSION

Educational Technology Theory core instructional design principles, it is connected to learning theory, teaching theory and teaching practice bridge is used to actually guide the teaching process, "how to teach" and "how to learn" a specific prescription prescriptive theory. Since the birth of the discipline since the late 1960s, after nearly 30 years of research, has developed two different types of instructional design theory: One is the "teach-centered teaching design, and another based on school-centered teaching design. Instructional design theory to "teach" the center entirely around how to help teachers teach "and expand. It consists of the following links: teaching objectives analysis (through objective analysis to determine the teaching content knowledge points, as well as knowledge of the point of the teaching sequence), learner analysis (under which determine the starting point of the current teaching object teaching), on this basis, on the selection and design of the teaching strategy design and instructional media, formative evaluation, and timely adjustments and modifications to the teaching content and teaching strategies based on the formative evaluation feedback. After years of effort in educational technology experts, instructional design center to "teach" the formation of a considerable system integrity and strong operability theory and methods, and had a greater impact on the practice of teaching by majority teachers of welcome. Its advantages is conducive to the organization, management and control of teachers 'classroom teaching process is conducive to play the leading role of teachers, the drawback is that this teaching designed to ignore the students' initiative, students in the entire teaching process by instilling passive position. Obviously this instructional design theory is a direct service for traditional teaching mode.

From above analysis, traditional teacher-centered model facilitates teachers to organize, manage and control the process of classroom activities which conduct to teachers 'leading role, while its shortcomings is ignoring the students' initiative, the cognitive instructional design. Student-centered model can fully mobilize the initiative of students, creativity, and is conducive to the main role of students.

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