Study on the Deep Integration of Information Technology and Curriculum Teaching

Yanming Yang*, Youbao Ding

Qingdao Campus, Naval Aviation University, Qingdao 266041, China

*Corresponding author

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Abstract. The deep integration of information technology and curriculum teaching is topic focus of e-Education nowadays, and it is also a fundamental change in the classroom teaching structure supported by information technology. The key is to construct a new teaching model. The ultimate goal of applying information technology to curriculum teaching is to follow the teaching idea of taking students as the main body and teachers as the guidance, and to enhance the self-discipline and centripetal nature of learning subjects. The deep integration of information technology and education is not only the core content of education informatization, but also the way and method to realize education informatization. In this paper, we start with the analysis of the basic path of information technology and curriculum integration, and discuss the connotation and core elements of fusion, the methods and countermeasures of integration, and the future development direction of informational teaching, which has a certain reference value for guiding the reform of information-based teaching.

1. Introduction

The deep integration of information technology and education is the focus of today's educational information research. *The National Education Development Ten Year Development Plan* (2011-2020) pointed out that the deep integration of information technology and education is not only the core content of education informatization, but also the way and method to realize education informatization [1]. The Ministry of Education on *the Education Informatization 2.0 Action Plan* (2018) pointed out: based on emerging technologies such as artificial intelligence, big data, and Internet of Things, relying on various types of smart devices and networks, actively carry out research and demonstration of smart education innovation, and promote new technology supports the transformation of educational models and ecological reconstruction. "Full and deep integration" is fundamentally different from the traditional "computer-aided teaching" and "information technology and curriculum integration". Its main feature is that "information technology is required to penetrate into every link of the teaching process in depth, so as to realize the structural change of the school education system, especially the fundamental change of classroom teaching structure"[2]. That is to say, "the traditional teacher-centered teaching mode will be transformed into the student-centered learning mode", which can highlight the individualized teaching [3].

2. The Scientific Connotation and Core Elements of Deep Integration of Information Technology and Curriculum Teaching

2.1 The scientific connotation.

The integration of information technology and teaching is to create an information-based teaching environment, effectively integrate information technology into the education and teaching process of various disciplines of the school, and realize the characteristics of both the teacher's leadership and the student's subject. Exploring the new teaching methods, which bring out the initiative and creativity of students, and make a fundamental change in the traditional teacher-centered teaching model [4].

According to the cognitive characteristics of the students and the essential requirements of the course teaching, the information technology is effectively integrated into the whole process of the course teaching. The starting point and destination are to promote the development of the students. The understanding of the

deep integration of information technology and curriculum teaching must transcend the conditional elements such as information technology, curriculum teaching, and teaching environment. From the standpoint of the essential element of student development, consider what is the deep integration of information technology and curriculum teaching, and why to do it. In view of this, we can understand the deep integration of information technology and course teaching as: in order to better play the educational function of the course teaching, in accordance with the students' cognitive needs, according to the students' cognitive characteristics, the characteristics of the times and the teaching of the course essential requirements, the effective integration of information technology into the whole process of curriculum teaching, through the aggregation and promotion of high-quality curriculum resources, providing intelligent learning analysis, scientific and rational division of labor and human resources can not only give full play to the leading role of teachers but also highlight An information-based teaching environment that reflects the student's dominant position to promote better development of students.

2.2 The core elements

The deep integration of information technology and curriculum teaching has four core elements. Firstly, the ultimate goal of the deep integration of information technology and curriculum teaching is to give full play to the educational function of curriculum teaching. Secondly, the students' learning needs and the construction of information-based teaching environment are prerequisites for the deep integration of information technology and curriculum teaching. Thirdly, the characteristics of teaching content and teaching objects are the focus of the deep integration of information technology and curriculum teaching. Fourthly, it is the practical pursuit of the deep integration of information technology and curriculum teaching to change the teaching mode and improve the teaching effect [5].

3. Countermeasures for Deep Integration of Information Technology and Curriculum Teaching

The deep integration of information technology and curriculum teaching is to use information technology to solve the problems existing in traditional curriculum teaching, so as to better play the role of curriculum teaching in promoting students' development. In view of the current development of information technology and curriculum teaching, the deep integration of information technology and curriculum teaching should be achieved by aggregating and promoting high-quality curriculum resources, providing intelligent learning analysis, scientific and rational division of labor between human and machine, and creating an intelligent environment. [6].

3.1 Improving the infrastructure construction under the condition of smart education

The hardware facilities are prerequisites for integration. The weak infrastructure (hardware) such as campus network hinders the process of teaching information construction. All schools must increase the intensity of informatization construction, effectively transform traditional teaching concepts, vigorously promote the advantages of using information technology to teach, and continuously improve students' rationality. The ability and level of knowledge acquisition through informational teaching. Information technology is a necessary means to cultivate compound talents in the 21st century. However, information technology cannot be effectively promoted in integration with teaching due to the lack of infrastructure. The local government departments and schools should attach great importance to and take corresponding measures to solve the problem of lack of configuration of information technology hardware facilities, and constantly improve the infrastructure construction of campus networks and digital campuses under the conditions of information technology, and create favorable conditions for the development of integration work [7][8].

3.2 Aggregating and pushing high-quality curriculum resources to achieve sharing

The prominent problem in the development of education in China is the unbalanced development, especially in school curriculum construction. The monotonous curriculum resources and traditional teaching methods inevitably lead to inefficient learning of these students. In addition, although some schools have developed a lot of suitable curriculum resources for their students to learn, but because most of these curriculum resources are presented in paper or simple multimedia form, and the presentation is not the way

students like, so no matter how valuable these curriculum resources are, they cannot stimulate students to learn. Information technology uses its characteristics of fast transmission speed, wide resource sharing range and strong information processing ability to aggregate high-quality and multi-form curriculum resources into a special cyberspace or designated cloud platform. This space or platform should not only have the function of storing and sharing resources, but also have the function according to teachers and information processing ability. Students' learning behavior data intelligently push the function of high-quality resources. Teachers and students can share high-quality curriculum resources through these special platforms and spaces under the guidance of relevant institutional mechanisms.

3.3 Changing traditional teaching methods and cultivating students' innovative thinking

For a long time, the students accept passively-received education due to the influence of traditional educational concepts, which severely limits students' sense of participation and innovation, and weakens the passion for learning. Information technology continues to expand and enrich the teaching information resources, and changes the teaching methods and organizational processes of the teaching process, improving learning efficiency. Therefore, it is necessary to change the traditional educational methods, make information technology the main tool for students to learn, train students to improve their learning ability through information technology, strengthen the cultivation of students' innovative thinking, and truly highlight the students' learning subjects. In teaching, the appropriate use of modern information technology, combined with the content of the textbook, according to the psychological characteristics of students, let students expand the wings of imagination, and have an impact on the development of students' innovative spirit and development creativity.

3.4 Providing smart learning analysis and promoting students' individualized learning

The students' individualized learning refers to students' learning according to their own goals, progress, favorite ways and states. It has always been a common concern of educational philosophy, educational psychology, curriculum and pedagogy. However, this ideal did not become a reality in the existing physical space, or did not become a universal reality due to various constraints. The main reason is that teachers face too many students, coupled with the problems of teachers' personal qualities and abilities, can't provide each student with targeted learning analysis and appropriate learning guidance. Therefore, in the existing physical space, students have no way to achieve individualized learning. The virtual space created by information technology provides students with smart learning guidance and help by recording learning process, identifying learning situation, perceiving learning state, and making real-time statistics and analysis by using cloud computing and cloud services, big data analysis, human-computer interaction and other technologies, including providing students with individualized learning guidance and help. The ways and means of learning, the analysis of the reasons for the problems in students' learning and the suggestions for improvement, the intelligent selection and delivery of students' learning resources are related to the individual learning information of students. According to intelligent information, students can improve and adjust their learning in time with the help of teachers on the spot, and then realize individualized learning.

3.5 Strengthening teacher training and improving ability to use information technology

In the process of promoting the integration of information technology and teaching, teachers should make full use of modern teaching methods, strengthen learning and research, further enrich their knowledge system and information technology level, and improve their professional ability and adaptability. Local educational administrative departments and schools should formulate detailed training plans and programs, insist on inviting in and going out, organize teachers to carry out technical training in a planned and step-by-step manner, change the focus of training from the traditional teaching mode to the modern teaching mode of integrating information technology with teaching, and use modern teaching methods. Educational ideas arm the mind, fully understand the advantages and significance of information technology in teaching, so that it takes the initiative to organize teaching activities by means of information technology, and promote the integration of information technology and teaching.

4. The Future Development Trend of Educational Informatization

4.1 Deep integration of information technology and curriculum teaching

The deep integration of information technology and education is the development stage from the accumulation of teaching informatization in quantity to the promotion of education quality in an all-round way. Information technology transcends the auxiliary nature of being a "tool" and emphasizes the deep combination of information technology and various elements of the education system, from top to bottom and from the educational concept. From the perspective of school structure, curriculum teaching and policy, the reform and innovation of education are promoted in many ways. "Fusion" includes the process of non-separation, mutual penetration, interaction and integration, emphasizing organic combination and seamless connection.

4.2 Cloud computing will reconstruct the existing educational information system

Taking full advantage of cloud computing, we optimize and integrate the traditional education information system and campus network system, construct the education cloud service platform, and form a new generation of digital campus system and intelligent campus system. Thus, we can reconstruct the educational information system, aggregate a wider range of educational resources, establish large-scale unstructured educational data that can be flowing, accessible and applied, and form large-scale educational data to support the whole process of intelligent decision-making, implementation and evaluation of education and teaching. In the era of education cloud, digital campus is no longer isolated. All teachers and students can share the high-quality resources of education anytime and anywhere. Big data of education will help to promote education evaluation, educational decision-making, innovative education practice, and provide great opportunities for intelligent support of education and teaching process [9].

4.3 Teaching resources turn from support education to support learning

In the aspect of teaching resources, the emphasis will be shifted from the construction of resources supporting teachers' teaching to the construction of resources supporting students' individualized learning. The learning resources will change from unidirectional, static and solidified in the past to open and generative. The learners can participate in the generation of the content of resources themselves, and keep the renewal and interaction in the dissemination and utilization of resources. The development of learning resources has expanded from content-oriented to learning-oriented, and a ubiquitous, personalized, intelligent, virtualized and open resource evolution system has been formed.

4.4 Teaching mode from closed to open

With the help of digital campus and various learning terminals, the interconnection between pre-class, in-class and after-class can be realized. The school teaching has developed from single classroom teaching to diversified open teaching. The school provides "wisdom courses" for every child. The students can preview the learning content of the unit and learn electronic textbooks with the help of electronic schoolbags. The teachers can design classroom exercises according to students' feedback, conduct individual tutoring for students, and monitor students' knowledge points online to follow up tutoring. This change in students' learning behavior will promote the change of teachers' teaching methods: students are no longer confined to learning in the classroom, and various resources in the cloud provide students with a wall-free classroom. All kinds of new teaching methods will break through the limitation of time and space in school teaching, and promote the school's teaching mode from closed to open.

5. Conclusion

The integration of information technology and curriculum teaching is an inevitable trend in the development of education and teaching. Adhering to the people-oriented teaching philosophy, using intelligent teaching methods, giving full play to students' subjective initiative, using information technology appropriately for the whole process of teaching, and promoting the harmonious development of the mind and body of educators is the main purpose of information technology [10]. In the process of information technology and curriculum integration, information technology does not play a separate role, but is integrated into the specific teaching environment and teaching links. Therefore, in the process of using information technology, we need to pay attention not only to the improvement of technical means, but also to the

integration of information technology with teachers, students and teaching content. Any technical means has its own strengths and weaknesses, has its own characteristics and scope of use, and must not be reinvented and follow suit. The integration of information technology and teaching is a dynamic process. As an education practitioner, lifelong learning is an essential quality. Under the guidance of information technology, we should continuously enhance our teaching skills, improve teaching methods, and achieve teaching goals.

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