Construction of Mobile Learning Model Based on Network Collaborative Inquiry from Bigdata

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Abstract. The rapid development of information technology represented by media and network is changing our work, life, and learning style. In recent years, with the development of information age and bigdata, mobile learning is being widely used in numerous industries and areas. It is also gradually penetrated into information education. Through the creation of network collaborative inquiry learning model and its application in teaching, this paper tries to study a mobile learning model of network collaborative inquiry based on bigdata.

1 Introduction

With the coming of information age, the transition of knowledge, as well as rapid development of multi-media and network technology, people's living style and learning style are experiencing a historical change. With the fast development of information technology and its widespread dissemination and application in higher education, education and teaching process in colleges and universities are undergoing a profound reformation. The construction of collaborative inquiry mobile learning model supported by multi-media network in particular, integrates modern information technology and new teaching method, and develops it as a mainstream teaching model for various subjects and levels. Therefore, it will promote the teaching reform in universities to a brand-new development stage. As early as 2007, the Ministry of Education pointed out in its key points that it would further deepen the reform of education and teaching, focus on enhancing students' scientific and cultural level, and cultivate students' creative spirit and practical ability. Meanwhile, it would support and encourage universities to conduct research-based learning and creative experiments.

2 Network Collaborative Inquiry and Mobile Learning

Collaborative learning under network environment is to establish collaborative learning environment by utilizing computer network, multi-media, and other related technology, so that teachers and students, and students themselves will discuss and cooperate about the same learning content. Therefore, they will form profound understanding and master the teaching content. During this process, learners will cooperate with each other, perform their own functions, help each other, give play to cooperative effect, and complete learning tasks together by means of certain network interactive platforms.

Characteristics of collaborative learning under network: interactive, collaborative, open, individual, and resource sharing.

Web-based inquiry learning is a process that learners achieve preset tasks, goals, and solve actual problems based on network. Through a large number of topic learning resources and collaborative exchanging tools, learners will select and confirm the research project. Then, they will collect, arrange, and synthesize all the resources.

Mobile learning means that learners can acquire learning resources at any learning time and any place through mobile devices (such as mobile phones, and PDA with wireless communication module) and wireless communication network. Learners will exchange and collaborate with others, to construct individual and social knowledge.

Mobile learning can not only adapt to traditional teaching model, but also effectively supply traditional teaching models by combining its characteristics with advanced technology. Meanwhile, the appearance of mobile learning overturns previous learning styles and inherent thinking of learning. Meanwhile, mobile learning inherits the advantages of digital learning, featuring the characteristics such as mobility, convenience, self-reliance, efficiency, and situation. Therefore, it can provide learners with more widespread learning space. With the construction of educational resources, new mobile learning model based on wechat + micro course is more and more widely used in the basic education and higher education of China. At present, mobile learning model for university students is also presenting diversified development tendency, while network collaborative inquiry learning model based on bigdata is an outstanding mobile learning model now.

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3 BASIC ELEMENTS AND PROCESS OF NETWORK COLLABORATIVE INQUIRY LEARNING MODEL

Web-based collaborative learning model usually contains four basic elements: collaborative group, tutors, learning resources, and collaborative learning environment.

3.1 Collaborative group

The collaborative group divided by certain standard is a basic component of collaborative learning model. Collaborative group can be designated spontaneously, whose structure is usually loose. For example, learning partners concerning about one question usually come from different grades, classes, or with different background knowledge to discuss about their study. Teachers (online teachers or teachers in actual life) also organize some collaborative groups with compact structure, to perform regular discussion and assess their learning results. The different way of dividing groups will directly influence the effect of collaborative learning. Generally speaking, 3-6 members in a collaborative group will be better.

3.2 Tutors

Tutors are essential in collaborative learning model, because they will be responsible for organizing questions, evaluating the results of collaborative learning, organizing discussion, and monitoring the process of collaborative learning. Meanwhile, tutors will give effective guidance when students cannot achieve learning objectives through collaboration or self-study. However, collaborative learning puts forward stricter requirements for tutors, which requires tutors to form new educational thinking and educational concept, changing from traditional "teaching"-centered to "learning"-centered education. At the same time, it requires tutors to realize the optimal combination of these two concepts.

3.3 Learning resources

Learning resources refer to the resources utilized in collaborative learning, such as virtual library, online demonstration, and teaching materials. Enriched learning resources designed by teachers are the basis for web-based collaborative learning. Without resources, teaching is like the water without a source.

3.4 Collaborative learning environment

Collaborative learning is performed in certain environment, including the hardware environment and organizational environment for collaborative learning. Hardware environment refers to the hardware conditions required by collaborative learning, namely the network environment. While organizational environment is the organizational structure of collaborative group, as well as the software environment required by collaborative activities, such as discussion environment, and file transfer interface.

Collaborative learning encourages students to take part in the inquiry process, to compare their different opinions with others systematically. Then, they will form the thinking habit of solving problems by various methods. When designing network collaborative learning, we should consider the above factors, and make the most of network technology to promote learning.

The web-based collaborative inquiry learning model includes five stages: determining topic and formulating plans, individual inquiring learning, collaborative inquiry learning, constructing group results, and displaying group results. Each stage is divided into different learning units, while each unit has corresponding learning activities and learning objectives. Therefore, teachers can select proper teaching activities and reasonably arrange their class period in line with teaching materials and the requirements of teaching methods. It is shown as follows:
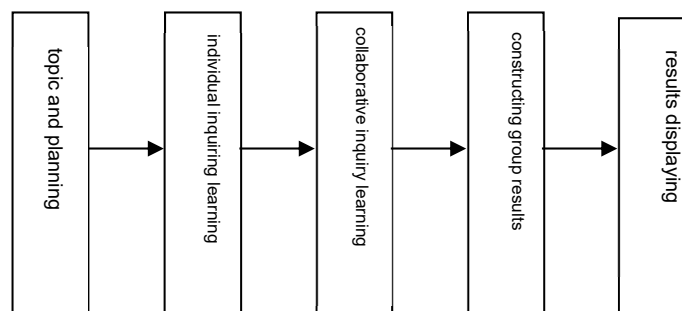

Figure 1. Process of Network Collaborative Inquiry Learning

4 MOBILE LEARNING SYSTEM BASED ON MOBILE APP

Mobile learning system based on mobile APP consists of the module for students, teachers, and managers. It is shown as the following pictures in specific:
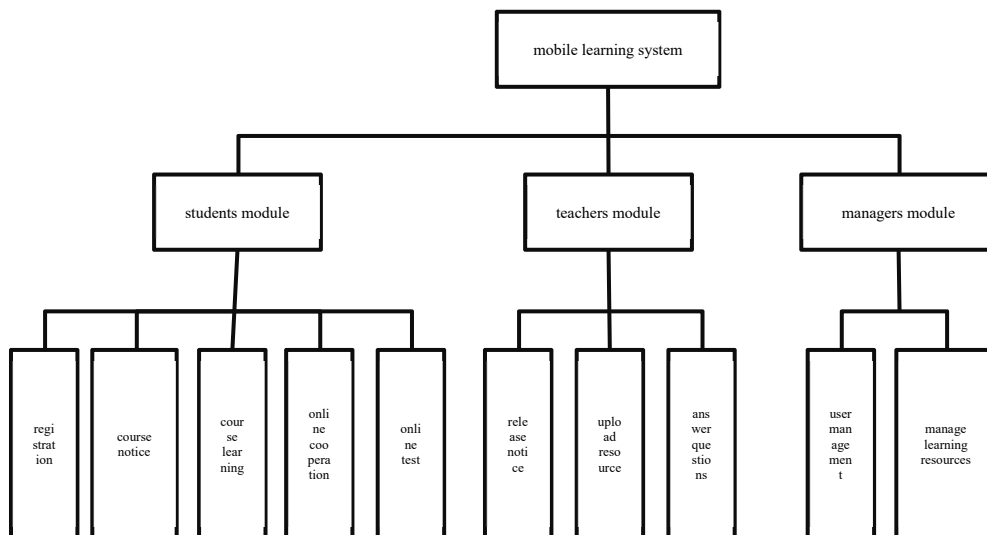

Figure 2. Modules of Mobile Learning System

Through developing mobile learning system for "Modern Educational Technology" and learning terminal software based on mobile APP, teachers will upload teaching syllabus, teaching plans, learning contents, project cases, films, videos, and other resources to resource library. Learners will log in mobile learning system to make independent mobile learning through mobile terminal. The learning interface consists of four parts: "course notice", "course resources", "learning tasks", and "online questions". Learners can understand recent teaching arrangement and teaching situation through "course notice", to formulate their learning objectives and learning plans, and arrange their learning time. Meanwhile, through "course resources", learners can browse the learning contents of the course, watch videos about teaching cases, and download courseware and teaching plans, to strengthen and consolidate their weak links. On the other hand, "learning task" reminds learners to complete corresponding tasks and online test after independent learning. At last, learners can ask and exchange with teachers and other learners through "online questions" in time.

5 CONSTRUCTION OF MOBILE LEARNING MODEL BASED ON NETWORK COLLABORATIVE INQUIRY FROM BIGDATA

5.1 Problems in traditional teaching

The author carries out discussion and research about the "Modern Educational Technology" in our college. Because of originally pure teaching environment, it adopts traditional classroom teaching model for theoretic module, skills module, as well as design and making courseware. The teacher stands on platform and teaches all the students, while students listen to the course and take notes. Due to limited conditions for teaching experiment environment, the experiment for media operation and courseware preparation cannot be carried out. However, teaching methods mainly utilize PowerPoint electronic writing, which only replaces the function of traditional writing. This is typical "teaching"-centered model, which may cause many problems:

As a course in methodology, it does not take modern teaching methods and ways to change its teaching form, so that students may have the wrong impression that teachers do not have good application ability of educational technology or their educational technology is not useful.

Theory learning of the course only adopts one-way transmission, while information feedback and interaction are not smooth.

· Without considering the difference of different learners, students' questions cannot be solved effectively.

The evaluation way concentrates on summative evaluation of final exam, which can arouse speculation easily, so it is difficult to accumulate knowledge and skills. The above teaching result is a common problem of "teaching"-centered teaching model. The one-way information transmission during the teaching process ignores the recognition process and acceptation ability, and it cannot mobilize learners' activity. As a result, it may affect the learning effect and learning efficiency.

5.2 Construction of Mobile Learning Model Based on Bigdata

Aiming at these questions, the author first creates a learning group with mobile APP, and proposes a mobile learning model of network collaborative inquiry based on bigdata. Based on the theoretical discussion about this research, this paper conducts primary research and reflection on its application and role in collaborative inquiry through creating and managing mobile learning group. It selects a class as an experiment, analyzes and compares the operating results of collected data.

According to the results, it further revises and consummates this model, to verify the effect of mobile learning model based on network collaborative inquiry from bigdata.

Through three rounds of action research, it continuously consummates and revises the model, and forms a specific teaching model. The model is shown as follows:
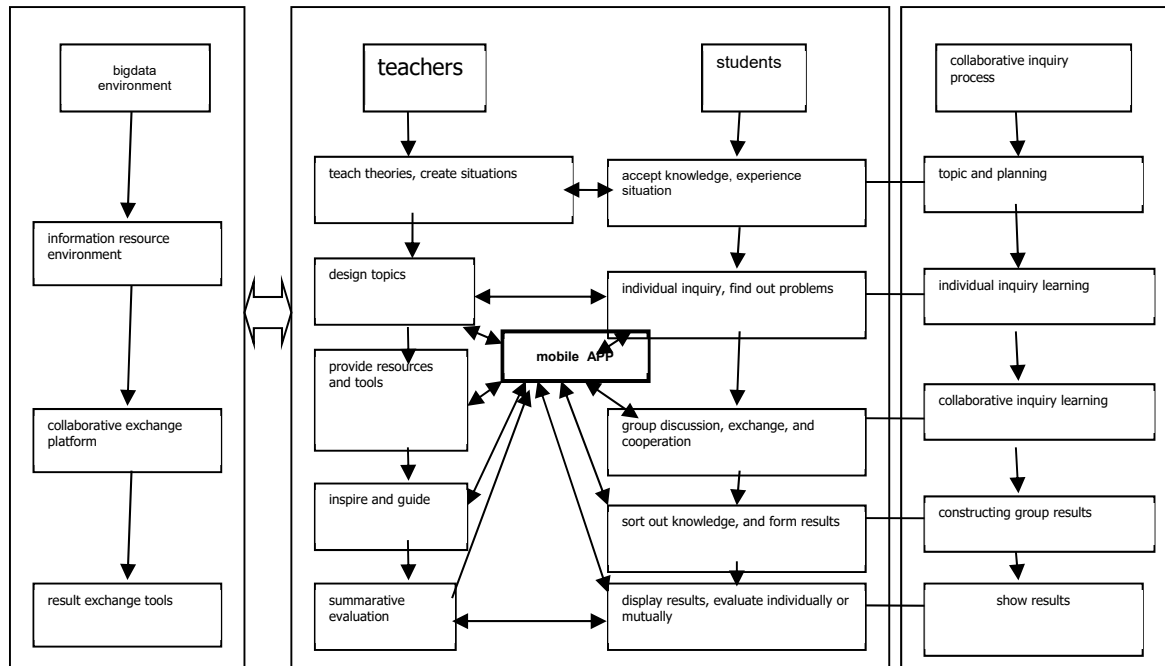

Figure 3. Mobile Learning Model Based on Network Collaborative Inquiry from Bigdata

This model emphasizes the teacher-student relationship: teachers are instructors and opinion providers, their relationship is equal, open, and democratic, and it advocates the equal status for teacher-student and student-student relationship, so that teachers and students can inquire questions together. Teaching strategies include some basic principles and specific teaching methods.

5.2.1 The strategy of inspiring and maintaining students' learning motivation

In principle, it combines internal and external motivation. In specific application, it mainly focuses on external incentives at the beginning of the activity, such as specific grades. During the activity, teachers will guide and feedback actively, to help students obtain successful experience and form favorable self-efficacy. Then, it can inspire students' internal motivation, such as knowledge seeking and expression.

5.2.2 The strategy of forming and concerning questions

The formation of questions can be determined by teachers, and can be found out by students in discussion. Remember to respond the websites with high browsing rate in time, lead profound analysis for the contents with high

relevancy to the question, arouse in-deep discussion, and shape correct attitude or method to solve problems.

5.2.3 The strategy of teachers' tutoring

During practical process, teachers should offer as many resources as possible and teach students to use web search tools. Meanwhile, they can link the blogs of experts online, to promote the course learning. As the role of an instructor or promoter of activities, teachers get involved in discussion with equal and democratic way, to persuade through reasoning. At early stage, teachers should give much attention, but reduce the participation degree in line with teaching conditions when students have accepted it and applied it freely.

5.2.4 Evaluation strategy

It takes formative evaluation in learning as the main standard, while evaluation methods mainly consist of self-evaluation from students, mutual evaluation between students, and evaluation from teachers. That is to say, it is divided by evaluation objects. On the other hand, it consists of evaluation for students, for project groups, and for other project groups. It pays much attention to the evaluation for learning process, which regards students' attitude towards the course participation as an important evaluation index. However, group result is an index for

the evaluation among groups, which is obtained through mutual evaluation between groups.

Acknowledgement

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