



## The Application of Mobile Learning in College Experimental Teaching

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### Abstract

First we analyzed the current forms of higher education and learning characteristics of the experimental courses, then we introduced mobile devices to the teaching process of experimental courses in colleges and universities. The introduction of mobile learning can meet the needs of higher education and to achieve the requirements of the reform. In this paper, we focuses on how to construct the learning platform in the integration of mobile learning and experimental courses. As well as the session framework for mobile learning activity design. Practice teaching proves that this method can better improve the efficiency of classroom teaching, and expand the depth and breadth of the students' study. At the same time, it can also promote the improvement of students' comprehensive ability.

**Key words:** Mobile learning; Experimental teaching; Computer education

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### INTRODUCTION

In pace with the development of mobile communication service and performance, cellphone, palm computer and laptop computer meet the learning needs anywhere. So what provides the possibility for lifelong learning. For colleges and universities, reform of teaching methods and means is

needed urgently to improve teaching efficiency. In order to meet the needs of the current education and reform, mobile learning provides the possibility of improvement of quality education at the same time to ensure the completion of conventional teaching tasks. Mobile learning is considered as a kind of future learning model, or it is an indispensable learning model in the future.

Abroad mobile learning began earlier, in the domestic the development is late, but its development is highly valued by the relevant departments of the government and scholars. At present, some of the results have been achieved in many industries used successfully. In the education, mobile learning application is widespread.

This paper focus on how to integrate mobile devices into traditional experimental teaching and enable students to study actively. With integrating mobile learning and experimental courses, learners not just by reading and listening obtain information but also be through a variety of mobile devices to participate in learning. Through communication of students, who access to information and share experience. Taking advantage of the advantages of mobile learning devices' portability, flexibility and mobility, it makes the learning process more easy to mobilize the enthusiasm of students and stimulate learning interest. What effectively expand the experimental teaching process, so as to improve the efficiency of students' experimental study.

## 1. MOBILE LEARNING

### 1.1 Mobile Learning Concept

Mobile learning is a learning that can occur at any time and at any place with the help of a mobile computing device (Sharples, 2000). The mobile computing device used in mobile learning must be able to effectively present learning content and can provide two-way communication between teachers and learners. The definition of the

Committee of Educational Technology Association of higher education in China: the mobile learning is based on the relatively mature wireless mobile networks, Internet, and multimedia technology, students and teachers through the use of wireless devices (such as mobile phones, PDA, laptops, etc.) achieve interactive teaching activities, as well as educational, scientific and technological aspects of information exchange what is more convenient and flexible.

On the basis of digital learning, mobile learning can bring a new feeling of learning through the effective combination of mobile computing technology to the learner. Although mobile learning has different meanings in different social groups, it is considered as a future learning model. The mobile learning is developed based on the digital learning. It is the extension of digital learning. In the traditional study of printing textbooks also can be a good support for the learners at any time to learn, it can be said that the textbook has become a tool for supporting mobile learning, and mobile learning has been around us.

## 1.2 Characteristics of Mobile Learning

Mobile learning is a new stage in the development of digital learning. Mobile learning in addition to all of the characteristics of digital learning, there is its unique characteristics, that is, the learner is no longer limited to the computer desk, can be free, anytime, anywhere for different purposes, different ways of learning. Learning environment is mobile, teachers, researchers, technicians and students are mobile. In addition to network, multimedia, digital features, but also it has its own characteristics:

(a) The most notable feature of mobile learning is mobility: Mobile meets the learning needs of learners at anytime and anywhere. It can give full play to the autonomy of students learning and can better create the situation of learning.

(b) Mobile devices can be carried with portable convenience: The development and application of wireless network technology provides convenience for mobile learning. Mobile communication technology is convenient for the exchange of real time, which makes it possible for students to learn in time.

(c) Mobile learning is a learning process based on learner: According to their own actual situation, the learners can customize the learning content, control the progress of the study, choose the time and place, so as to realize the individualized learning. Learners can also choose to the ways to learn, such as independent exploration of learning or collaborative learning.

(d) Rich multimedia learning resources broaden the horizons of the learner and improve the enthusiasm of learners learning: Convenient communication facilities facilitate the learners to discuss and exchange that can be helpful to improve the learning efficiency.

(e) Mobile learning can make learning activities more situational: Such a scenario can be a real environment where mobile learning is located, or a learning link or scenario and this kind of situation is helpful for the learners' autonomous exploration and cooperative learning.

From its implementation approach, the mobile learning technology is based on mobile computing technology and Internet technology, namely, mobile interconnection technology; The tool of the realization is a small mobile computing device, the device for mobile learning from the characteristics of such an analysis: portability, that is, the device is small, light weight, easy to carry; no linear (wireless), that is, the device without the line; mobility.

Mobile learning is not only a simple transplantation of network learning platform and course, but also is more consistent with the learning needs of mobile state, such as micro. Miniature is that the learning time is shorter than in the past, and the transmission efficiency is higher, which can attract the user to participate in so that the mobile learning can keep a good effect.

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## 2. COMBINATION OF MOBILE LEARNING AND EXPERIMENTAL COURSES

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### 2.1 The analysis of experimental course

Experiment is not only the important way that students acquire knowledge, but also the important means that they carry out knowledge exploration and innovation. What can improve students' scientific interest in improving students' ability to solve problems. As a basis of natural science, the experiment has a close relationship with daily life. At the same time, the new curriculum reform advocates from the students and social development needs and exerting the advantages of natural science. The experiment teaching can narrow the distance between the students and the specific subjects and Make the students realize the practicality and value of knowledge.

According to the ways of students' participation, the experiment can be divided into two kinds: the teacher demonstration experiment and the students' operation experiment.

The demonstration experiment is that in the classroom the teacher demonstrate contents to the students who look at them. Which has the effect of transforming the abstract image into the image. Students' operating experiments are conducted by the students themselves. In view of the limitations of realistic conditions in some schools, some experimental phenomena are diverse, microscopic, and dangerous. In addition to students hands-on operation and teachers demonstration, experiment teaching can be completed through the use of multimedia courseware and virtual experiments. Mobile learning can provide support

for experimental learning and it can also be a kind of media learning resource in traditional digital learning. Experiment courses are practical courses. It is a need for students who have the operation ability and the students need to cooperate with each other. So in experiment teaching, it is more advantageous to improve the students' enthusiasm and initiative. It is necessary to apply the mobile learning to the experimental teaching.

## 2.2 Analysis of Learners

Mobile devices have obvious advantages such as portability, operating convenience, communication and interaction, and user targeted, etc. The power of it is beneficial to the transformation of traditional learning to mobile learning. At the same time, contemporary learners have the characteristics of the times to better adapt to and promote the application of mobile learning mode. First, students have a high rate of holding a variety of electronic products. Secondly, in the era of knowledge update quickly, it is more easy to accept new things for students. They show great curiosity and happiness to use of new technologies, so they eager to use new technology to learn. Before the word of mobile learning appear, the application of mobile devices in the field of education has been carried out. Practice proves that in the new technology, the learners' learning efficiency and learning efficiency were significantly improved. Thus, it is necessary and urgent that in the university carry out mobile learning.

## 2.3 Learning Resources and Platform Construction

Learning resources are all the factors that can be used by the learners in the process of learning which mainly include the support of learning, financial, material, information, etc. Mobile learning resource is a new type of learning resource, which is based on the development of the network and mobile communication technology. And mobile learning requires that it is suitable for the study of portable mobile devices, mobile phones and handheld computers and other portable devices for access and participation. Students can receive the content of their own likes and needs at any time and anywhere. At the same time teachers also can solve the problems in the process of study and practice. The design of mobile learning resource should follow the following principles.

### 2.3.1 Open Thinking

Teaching design in mobile learning should emphasize the cultivation of open thinking. The whole experiment teaching design should reflect the openness (Aderinoye, Ojokhela, & Olojede, 2007; Cook et al., (2007). It should be pay attention to openness in the teaching content organization, the use of teaching media and the design of teaching strategy. Thus, it can not only meet the needs of different students, but also can cultivate students' innovation ability.

### 2.3.2 Suitable Size Unit Module

Mobile learning has no strict requirement on learning environment. The learning environment is no longer limited to the classroom and it requires to meet the requirements of learning anytime and anywhere. Due to the increase of external interference factors, the size of the unit module in mobile learning must be short and moderate. So its size is generally not more than 30 minutes. If the task is larger, the task can be divided reasonably, which can meet the requirements of different learning state.

### 2.3.3 Goals Must Be Clear, Better Targeted

We must do a good job on the knowledge level of learners, learning ability, learning needs and learning habits and other aspects of research. So that we can choose and organize the learning resources and pay attention to teaching effect.

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## 3. INTERFACE DESIGN REQUIRES SCIENTIFIC AND REASONABLE

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Learning environment requires outstanding personality. Students can customize the personalized learning interface which can provide rich and convenient means of interaction. Also asked to provide a variety of interactive ways between teachers and students as well as students and students. It can create an interactive learning environment, so that increase students' learning interest and create a harmonious learning atmosphere.

### 3.1 Create A Harmonious Learning Atmosphere

Mobile learning resource is the important component of the mobile learning system. It is an important component of the mobile learning system. It is a tool for the teaching of the teachers. There is a big difference between the mobile learning resources and the ordinary learning resources. Mobile learning resources must be in line with the conditions of mobile learning, pay attention to the development of the students in the sense of hearing, system time, easy to be disturbed by the outside world. As informal learning, mobile learning is more flexible, environmental and personal, but the key is to study the characteristics of learning resources and the needs of teachers and students.

In experiment teaching, mobile learning provides students with flexible learning style, which includes the study of autonomy and multi-way. The design of mobile learning teaching content should provide a wealth of reference resources.

Based on the learning of mobile devices, it provides a new learning environment and methods for learners. However, if this learning method is to play an important role in the study, which also needs to study and design the whole system of learning, for core content curriculum resources in the system, in particular. So that it can

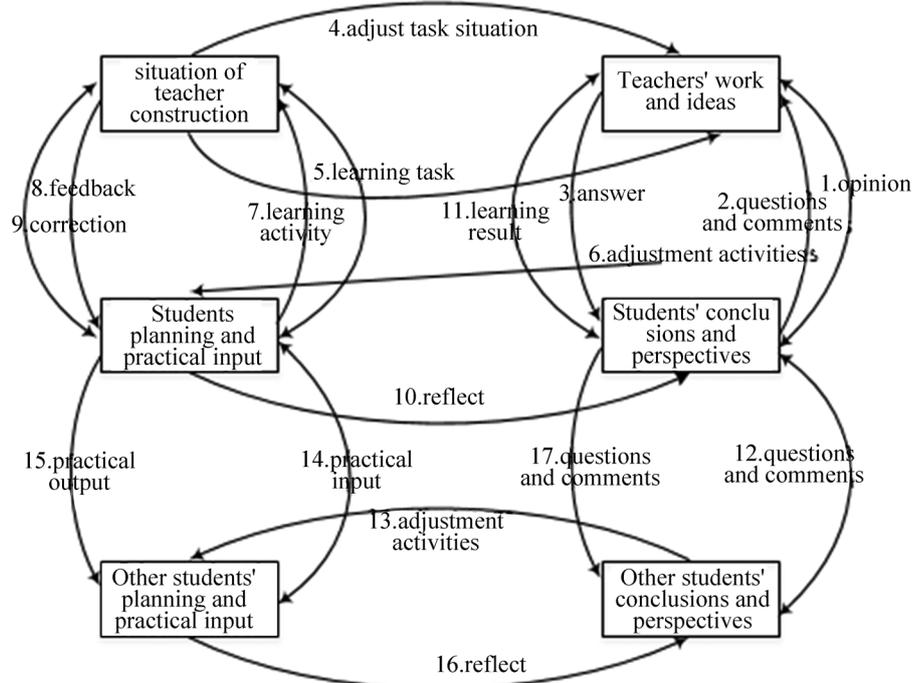
satisfy the practical needs of the learners. And with the progress of various hardware technology it will be more comprehensive and perfect.

### 3.2 The Design of Experiment Courses

Mobile learning environment is a relatively open learning environment. In such an environment, learners tend to get lost and can not better focus on learning tasks. Therefore, in teaching generally teaching strategies are cooperative learning and self regulated learning. Teachers play the role of organization and coordination in teaching activities.

In mobile teaching the activity design of mobile learning is an important part of teaching. Good teaching activity is the key to the success of mobile learning. We can achieve the learning activities by mobile digital tools such as exploring activities, investigating activities, discussing activities, recording activities, capturing data, build simulation activity, share the record data, and verify the activity and reflective activity, etc.. In mobile learning, we can integrate the above activities in order to effectively support the learning activities of the experimental courses. After the above activities are integrated, we can get a session framework as shown in figure 1. This framework is very important for the experimental teachers how to design learning activities. The conversation between the teacher and the student can be defined from two levels from the figure: One is the loose level, the focus is on

the description of the theory and the concept of the task; another is the empirical level, the focus of this level is to design the practice of operating activities and learning activities. These two levels are interactive, but in the loose level, the interaction is in the form of communication. That is teachers description. Teachers describe theoretical knowledge and task requirements, students' questions, students' understanding of their knowledge and task requirements. In the empirical level, the interaction behavior is adaptive. Students participate in practical activities in order to achieve the purpose of learning, and when learning environment changes, students can change the way of learning. The interaction between the level of experience allows students to adjust their practices in a timely manner, but the loose level of interaction is proud of the students' Reflection on the experience. Similarly, if the learning situation of the teacher's construction is suitable for the students' needs, then the students will get the best knowledge. At the same time, teachers' explanation of the theoretical knowledge in the loose layer are pride in the performance of the students at the level of reflection. The whole process is not only for each of the students and teachers, but also to the students and students together. At the level of experience, the feedback between students is reflected in the form of the results of the activities. the feedback between students is reflected in the form of the results of the activities.



**Figure 1**  
**The Dialog Framework of Experimental Curriculum Activity Design**

The framework of this session is a framework for the design of the learning process. The each activity in the frame is a function of stimulating students' cognition and practice. At the same time produce continuous, repeated

participation, questions, adaptation, practice, analysis, sharing, reflection and elaborate and so on.

The session framework is the reference and basis for the design of mobile learning activity and is a test of

whether experimental teaching can motivate students to learn. At the same time, it is also a method to test whether the experimental teaching method is suitable for the practical learning process.

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## CONCLUSION

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With the development of computer network technology and communication technology, mobile devices are becoming more and more popular among college students. On the basis of “personalized learning”, mobile learning should pay more attention to the study of “human nature” service. If mobile learning can be used as a learning style in higher education, it must be able to understand and meet the needs of learners. It is very important to introduce mobile learning into college classroom. We combine characteristics of mobile learning and experiment courses. There is no doubt about its feasibility that the research and exploration on the integration of mobile learning and experimental courses. Although the field has just emerged, from the characteristics and development trend of mobile learning, this research will get more and more attention of scholars. The combination of mobile learning and experimental course will make the teaching

of the experimental course have a profound change. The teaching efficiency will be greatly improved, which will effectively expand the depth, breadth and student participation in the teaching of experiment course. Mobile learning is a new direction in the development of modern educational technology. As a teacher, we will follow the development of modern information technology.

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