Mobile Learning Application Design

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Abstract. Following the development of smart mobile technology and the dissemination of smart devise, the learning mode under information technology is known a huge evolution. Mobile learning recently turned into the research hotspot in commercial and academic field. The aim of this article is to help improving mobile teaching in education institution, to offer methods and measures of mobile teaching design for teachers, and to provide guidelines of mobile learning to students. Also, this article concludes the discussion on how to design mobile learning platform and how to implement it through the 3 aspects of institution, teacher and student; how to integrate mobile learning to the course design regarding different disciplines; what kind of teaching activities are suitable for mobile learning.

Introduction

Following the development of smart mobile technology and the dissemination of smart devise, the concept of ubiquitous learning has already moved from anytime and anyplace of e-learning and m-learning to the right time and the right place, as well as providing the right resources and partners [1]. So, in essence, ubiquitous learning is an on-demand, adequate, instant learning style [2]. A ubiquitous learning environment must be on-demand, adequate and instant [3]. Ubiquitous learning is an “everywhere learning” status [4]. Choosing an adequate learning mode in the defined environment can improve learning efficiency [5]. Various smart devices used by learners will become their instruments of ubiquitous learning [6]. With the development of mobile technology, mobile learning will contribute as one of the most method of ubiquitous learning. The objective of mobile learning is helping learner to learn any information in anytime at any place by any way of learning.

Mobile Learning Scenario

Mobility, efficiency, universality and individuality are the mains characteristics of Mobile learning [7]. Learners are able to carry on mobile learning on particular occasions according their own requirements.

1. During leisure time, on the way for example, learner can make fragmental learning by using smart mobile device.
2. In the less of network connection condition, at the place where there has no wifi for example, learner can study downloaded resources by off-line learning.
3. In the case of mathematics courses, mobile device can input complex mathematical functions and symbols by taking pictures in stand of traditional manual input.
4. When it’s difficult to painting by computer for art related course, students can submit photos by taking pictures.
5. For the vocal and music courses, mobile device can also help student submit their works by sound recording function.
6. For practice courses like internship panel discussion, students can communicate with others through different way as text, picture, sound provided by mobile device.

We can conclude that mobile learning will facilitate learning in particular occasion; therefore, teachers need provide teaching resources and teaching activities that suitable for mobile learning.
Deep integration of mobile learning platform and network teaching platform creates a great boosted in seamless learning. People can study with computer through network teaching platform, and also do fragmental learning by using mobile devices.

**Mobile Learning Application Design**

The main thing that distinguishes Mobile devices from traditional PC devices is portability. The development of mobile technology increases the popularity rate of mobile devices. Handheld mobile device becomes an indispensable instrument today, and it accompanied with the increasing demand of mobile learning. From student’s point of view, they want whenever and wherever possible to check out resources, watch teaching instructional video, accomplish homework and test, and communicate with teachers. At the side of teachers, they also need read over homework, communicate with students and follow students’ status at any time and any places.

**Courses Design**

- **Design of a New Course.** If this is a traditional course that never been transformed into online course, teacher need think about what students should receive as knowledge, skill and attitude, then design the contents of learning to achieve the goals, create the teaching activities to evaluate students’ progress and results, in the meanwhile, take the mobile learning characteristics in consideration when design courses.

- **Redesign of Existing Course.** If the course is already developed online and in practice, teacher need think about the redesign of these courses.
  - (a) Whether the type of program is fit for mobile learning? Whether the management of learner is convenient? Whether students are used to learn by smart phone?
  - (b) Whether the teaching resources are suitable to mobile learning? Whether mobile learning can enhance resources acquisition? How to distribute the mobile learning in the whole teaching process?
  - (c) What are the learning activities organized by this online course? Whether mobile learning can help in improving learning experiences and can help instantaneity of learning activities, like discussion, questionnaire etc.
  - (d) What kind of assessment is applied in the existing course? How can we improve it with the help of mobile learning, like online test, homework etc.
  - (e) What are the feedback modes of this existing course? Does mobile learning can offer more convenience like Q&A, notification, check of learning records etc.

**Design of Course Content**

The analyses of course content include 3 steps: the teaching content breakdown, knowledge navigator design and the presentation of teaching content.

- **Breakdown of Teaching Content.** Teachers should subdivide teaching content into different knowledge points, and decide which one should be transferred in classroom, which one need to be presented online, which one could be put on mobile device. The design depends on teachers’ experiences, the advantages and characteristics of online teaching and mobile teaching.

- **Knowledge Navigator Design.** After breakdown of teaching content, the teaching organization form should be taken in consideration. Mobile learning is a scattered, fragmented, small capacity and anytime anywhere learning mode, so that the design of knowledge navigator must be loosely distributed and rule-based at the same time in order to ensure the organic integration of various knowledge points. A reasonable site navigator can lead students self-learning by chapter, by topic, by mission, by teaching week and other navigator manners.

- **Definition of Presentation Form.** Teacher decides the presentation of every knowledge point according the teaching content breakdown. It means to design multimedia resources, like text, picture,
Design of Mobile Learning Resource

After the analysis of course content, it’s time to design best teaching resources which consist of any human or non-human resources related to teaching and learning. Here will focus on the design of online resources and mobile device based learning resources.

Choose the Resource form Suitable to Mobile Learning.

(a) TXT text: one paragraph news, one concept, one case, all above can be presented clearly on the mobile device by text form which is in accordance with students’ reading habit.

(b) Picture: both screenshot and photo can be presented by picture form on the mobile learning platform, integrating with text; the content will be visualized for leaner.

(c) Word, PPT, EXCEL, PDF file: these are usual online learning resources forms. Long file, multimedia courseware, financial report etc can be uploaded on office format. Student can download them in local disk to finish learning by using fragmented time.

(d) Short audio: audio learning could be effectuated on the way or during sports. These resources are more convenient when learner is moving. Also, it make possible to practice orally and vocally English.

(e) Short video: the teaching class, interesting film can be presented on the mobile device. Student can watch them online or download them for repeating in order to saving cost.

The Principles of Mobile Learning Resource Design. (a) The content of mobile learning must be as short, intuitive as possible. The content should present only one small knowledge point that allow learners to complete the study in short time by using mobile device, without external disturbance. Knowledge points are connected by navigator, but they are independent, separated and present the characteristics of microminiaturization and fragmentation.

(b) Learning resources design should take the mobile reading habit in consideration. One side, the structure and process must be clear, the other side, resources should not be compressed to ensure learner could preview by simple click and avoid second decompression.

(c) Create pleasure experience, motivate study passion. In order to attract student’s attention and increase their learning time, the designer should consider user experience in creation of resources. For example, use video, audio instead of text or office files.

(d) Considering size and format of resources. For example: pure text shouldn’t be too much; picture shouldn’t be too large; the format and size of video must be fit for mobile device. Current smart phone screen size is between 3.5 to 6.1 inch, and the screen resolution rate keeps between 480*800 to 1136*640, while pad screen size is between 7.0 to 10.1 inch, and the screen resolution rate keeps between 1024*768 to 2048*1536

Mobile Learning Activity Design

Learning activity includes online activity and offline activity, the last one consists of class discussion, experiment in laboratory, practical teaching etc. we will focus on the online activities design.

Analysis of Knowledge Type. Design the teaching activities according to 3 classifications: knowledge, skill and emotion. Knowledge can be divided into descriptive knowledge, procedural knowledge etc.; Skill can be divided into operational skill and creative skill etc. Emotion can be divided into quality culture and value guidance. different activities are convenient to different classification, for example, reading text and watching video are fit for descriptive knowledge; visiting and operational practice are fit for operational skill; cooperation and imitation are suitable to emotion culture.

Design of Mobile Learning Activities. Mobile learning activity design is similar with the one of resources; it should be defined according deferent knowledge type and take the characteristics of
mobile learning into consideration, like fragmented time and distractibility. Each activity should aim to one knowledge point or topic to ensure the effectiveness of learning activities.

Following some examples of mobile learning activities:

(a) Forum: Forum is an auxiliary communication tool of group activity. Teachers and students issue and respond post in forum. With mobile device, teachers and students can participate discussion through forum and topics whenever and wherever. The participation of student in discussion of a topic or question is evaluative.

(b) Roll play in forum. For example, in a local environmental discussion forum may include the minister, developer, the representative of council, environment protector and citizen who pay attention on the environment problem.

(c) Questionnaire: online questionnaire is helpful to learning activity. For example, teacher can get the information about students’ interests, objectives, what they previously learnt and their feedback of the course. With mobile device, students are easier to join the questionnaire so that the information is easier to collect.

(d) Email notification: email is an offline interactive communication tool through which teacher can group sending emails to alert those who did not hand over their homework.

(e) Teaching note: the teaching note provide a tool for teachers and students to take notes. They can organize teaching and learning documents during learning process. Teaching notes include my notes, teacher’s notes and teacher-students’ notes. Teacher and student can define the level of note and decide if their own note is shared with others.

First of all, mobile learning activity design should fit for learning objectives and contents. The accomplishment of each sub-activity within fragmented time contributes a step of the main activity.

Secondly, mobile learning activity intend to reinforcing and making up the deficiencies based on the framework of student’s knowledge.

Finally, mobile learning activity should focus on immediate feedback. The design and organization of mobile learning activities enforce communication between teachers and students through different ways, like notification, email, notes, discussion and other interactive communication. Also, mobile learning activity act as an extension of traditional class and network class, can alert students in real time in order to arrange revision plan.

The Design of Mobile Learning Evaluation

The evaluation of mobile learning is one part of learning process. It, create a new way to evaluate course learning. The evaluation based on mobile device can not only classify and evaluate the student, it can give feedback to the whole learning process in integrating resources and activities.

Advantages of Mobile Evaluation. (a) Enhance the management and monitory of students’ schedule; create an interaction more frequent between teacher and student, like notification of homework.

(b) Mobile evaluation more timely and more efficiency, that drives student study continuously and actively.

(c) Providing diversified evaluation mode is convenient to current learning environment of students. For example, student without computer can also submit homework or take test by using smart phone

(d) Teachers can give feedback to students’ learning result in anytime anywhere, and ad adjust teaching method timely to guide student in future.

Design of Mobile Evaluation. The design of mobile learning evaluation is similar with the one of learning activity; it should take in consideration of the characteristics of mobile, different knowledge, different learning objectives (knowledge, skill and attitude), integrating traditional evaluation mode in classroom and online education.

(a) Online homework: online homework is one of the most commonly used ways of class testing. Homework has 2 forms; group homework and global homework. The most important advantage of
mobile evaluation is that teachers can send email to students who didn’t submit homework to improve the result of learning.

(b) Online testing: student can revise at a convenient time. Online test can be repeated in different learning. Comparing with paper test, online test reduce teachers’ workload and give feedback timely. Single choice, multi choice, true or false, fill-in question, short answers are available in online testing.

(c) Learning record: student can check their learning record in mobile device, like active time, frequency of course participation, learning time of a course, times of resource checking, times of notes, times of homework.

**Principals of Mobile Evaluation Design.** (a) A clear plan of learning evaluation. This is key factor to introducing learning evaluation. Before the evaluation, make sure following questions are clear: which functions support evaluation activity, when publish the evaluation mission, if teachers need to receive notification before the end of evaluation, when feedback.

(b) Enough evaluation opportunity. It provides enough opportunities of evaluation when students are taking tests on the mobile device. Enough evaluation opportunities increase students’ learning skill, and ensure the learning quality in case of technical problem.

(c) Timely and efficiency feedback. Before the deadline of evaluation activity, teachers should send notification to make sure the efficiency of learning evaluation. After submitted the evaluation result, teacher should give the feedback and comments timely to students, in order to keep their learning interests.

**Conclusion**

Following the development of mobile technology, mobile device became indispensable instrument in everyone’s life. Mobile learning turned into an important tool in assisted learning which helps increasing efficiency by using fragmented time to study. This article is focused on the design process of mobile learning courses, including analysis of actual courses, design of course content; design of course resources, design of mobile learning activities and design of mobile learning evaluation. Wide application of online education platform and the introduction of mobile learning will increase efficiency of both teacher and learner.

**References**


