# Study on English MOOC online learning monitor system and model

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**Abstract**

Through assessing over a hundred known recent literature contributions on MOOC and ODL, we get some basic conclusions on MOOC: firstly, conflicting perspectives on MOOC divide education communities; secondly, formal comprehensive analyses of MOOC mostly concur that they are disruptive and possibly threatening to current higher education models, thirdly, reporting of MOOC learner experiences is positive. Based on a large number of documents and tracking projects, we find the result that a solid and effective research must be on the basis of knowing many of the requirements of object and explore specific system function, types of media and the study and practice aiming at certain groups. Therefore, we can only do system research by the way of combining theoretical and empirical. In the meantime, we can find the system model supporting theory from advanced learning theory. It is worth learning the excellent reference model of digital learning system that it can ascend the quality of mobile learning system model.

*Keywords:* MOOC, ODL, certification, monitor system, business model

## 1 Introduction

With the popularity of mobile devices, the reduce of mobile communication fee, [1] the increase of mobile learning applications, and people' growing awareness of lifelong learning, mobile learning is coming into people' work, study and life in a formal or informal way. Accompanying, the research of mobile learning has attracted more and more attention of scholars and experts in the field.

College students are greatly interested in mobile learning. At the same time, mobile learning also provides new method for teaches college English [2]. It also broadens the view sight to personalized learning and active learning via computer during the college English lesson. But we have not a useful mobile learning system, and the students also do not know how to choose the mobile learning method in different time and different places, and they also do not know how to integrate other learning style to mobile learning.

Aiming at exploring the M-learning System Model of College English， the paper firstly analyzes the relevant study of mobile learning both home and abroad, and then forms the foundation for M-learning System Model of College English from the aspects of the content and characteristics of mobile learning， theoretical model for mobile learning, and the conclusion form empirical research on mobile learning, on the basic of which, M-learning System Model of College English (MLMCE) is propose with the characteristics of micro-game, humanity, personalization. After that the paper discusses the architecture, function model and adaptive feature of MOOC. In addition, we use the case of designing an English vocabulary mobile learning system to elaborate how to use MOOC.

Mobile communication technology provides the technical foundation for people to work, live and learn anytime anywhere in the mobile environment. Mobile learning has become an important research topic in area of educational technology and computer application. Most of the current domestic and international E-Learning systems are primarily designed based on the distance learning with fixed desktop computer, can not fully meet the requirements of distance learning in mobile environment. Therefore, the research on the mobile environment for distance learning and mobile learning system design has important theoretical and practical significance.

## 2 Study work

*Thought*

1) After the comparative analysis of the definitions and concepts related to mobile learning at home and abroad, we assume "Mobile learning is the further development of e-learning" and explore the content and characteristics of mobile learning, and make analysis of the characteristics of mobile learning from mobile devices ,mobile environment and mobile learning activities;

2) This paper analysis the contrasts the theory of activity learning, context learning, distributed cognition, conversation learning and so on. Based on the "Analysis mobile learning activity learning theory" of Sharpies, "interaction model of Individual cognitive and distributed cognitive" from Salomon and "Technical support learning sessions model framework" of Laurillard, the author come up with CAD.

3) Through three links of letting respondents experience mobile learning, fill in the questionnaire and accept depth interview experience by using mobile learning system "learn easy", we understand lots of requirements for mobile learning system of college English and draw a series of meaningful conclusions;

4) Based on CAD theory model, empirical conclusions, the demands from College English new curriculum reform and the learning characteristics of college students, we

propose an M-learning System Model of College English called MOOC, and describe its architecture. In addition, we focus on the mapping function and functional design from the requirements aspects of MOOC theory model, empirical conclusions, the demands from College English new curriculum reform and the learning characteristics; Jafari/Epsilen next generation E-learning Environment is shown in Figure 1.

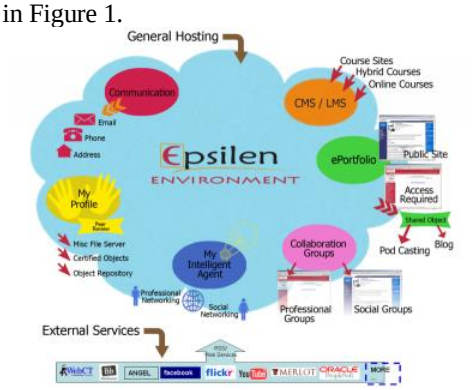


FIGURE 1 Jafari/Epsilen next generation E-learning Environment

5) Discuss the adaptive mechanism of MOOC in detail. Firstly, we analyze adaptive principles of XAHM and its shortcomings when used in mobile learning; then, following the design ideas and principles of MOOC, we revise and improve XAHM by five-level domain model structure，learning a single model of no knowledge only learning model and two-staged adaptive mechanism, and give the architecture of MOOC from the perspectives adaptive;

6) This study take college English vocabulary mobile learning system as an example and explained the design from MOOC in detail.

**Monitor system**

With the traditional classroom environment focusing on course, E-Learning environment with fixed desktop omputers focusing on learners，in different, learning in mobile environment, focuses on learners' activities, with learning content being practical problems-oriented in learners' lives and work, having the ability of context aware and collaboration with the mobile support, is a new learning methods. Existing development technology of E-Learning systems based on fixed desktop computers can not achieve these functions. To solve large-scale distributed computing and resources sharing issues, technology is raised, and its functions of resource sharing, personalized services and collaboration support can meet the mobile learning system users to access instantly rich and accurate learning content and get immediate learning support and collaborative learning, situation-based learning needs in the study. The learners' activities in the mobile environment occur in different situations, different sensor network system access through the Internet. The learning contents in mobile learning environment are changing with the learners' activities, learning resources are located in different virtual organizations, the information is gathered through search and classification, and the adaptation module for transmission is based on the situation to learners' mobile terminals; Learners in mobile environment need immediate support in collaborative learning, and learning partners, teachers and experts who}can provide this collaboration support, are located in different virtual organizations [3, 4]. Therefore, large-scale distributed computing and resource sharing in different systems are the key technical problems that mobile learning system to achieve its full functions. Grid technology provides an ideal technical solution to the problem. The thesis explores the theory and methods to design and develop a mobile learning system based on grid, the study involves theoretical analysis model, functional structure model and design methodology about mobile learning system based on grid, the main research methods includes use of literature research, content analysis, logical reasoning and system modelling.

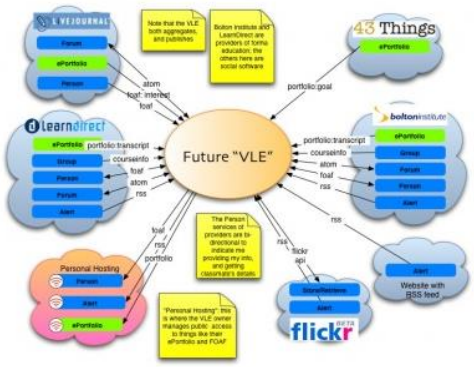


FIGURE 2 VLE of the future – Scofft Wilson PLEX Project

VLE of the future – Scofft Wilson PLEX Project is shown in Figure 2. We discuss theory foundations of mobile learning systems analysis based on literature research and content analysis in the field of mobile learning. Based on related theoretical analysis about learning in the mobile environment, through the comparative study of learning content, the core elements and key functions in traditional classroom environment, the general E-Learning environment and the mobile learning environment, the study has pointed out that mobile learning is cantered around activities, gear to practical problems-oriented in situation or their lives and have the ability of context aware. By applying M- Sharples' mobile learning theory based on activity theory, the thesis explores and builds the theoretical analysis model to guide the design of mobile learning system based on grid, which have the attributes of focusing on learners' activities, being practical problems-oriented in learners' lives and work, having the ability of context aware. Based on literate we research and content analysis about the learning technology system, E-Learning system and mobile application system, and other related fields of study, the thesis sums up the mobile learning systems' technical basis, elaborates mobile learning system classification from a technical perspective and analyzes mobile learning system architect we and tiered functional model, explores to build a mobile learning system based on grid functional strict we model [5]. By applying service-oriented system design methodology in design of mobile learning system based on the grid, the thesis is to solve the problem of immediate acetate information and rejoices retrieval and transmission, rejoices sharing in different system and collaboration support that mobile learning system faces. The thesis elaborates the principles of intelligent adaptively, context aware and collaboration

support of the mobile learning system based on grid, and explores mobile learning system based on grid design methods from the three aspects, as shown in Equation (1).

$$s(k) = \frac{\beta_o \mu(k) + \beta_1 n(k) + \beta_2 p(k)}{\beta_o + \beta_1 + \beta_2} \tag{1}$$

On the distance learning features in mobile environment. From a technical perspective, the learning environment for mobile content pushed to learners will be learning hands; From the perspective of learners, mobile learning can meet; From the perspective of mobile learning organization and implementation of mobile learning environment is learners "activities" for the centre, The practical problems facing the life and work of a new type of learning environment perceived functional. Learning system based on grid movement theory analysis should be the main content of the theory-based activities, from technical and socio-cultural analysis of the movement of two key dimensions of the main learning activity, object, tools, control, communications and the exchange of six scenes elements. To fully demonstrate the advantages of mobile learning and the sharing of resources in addressing grid, personalized support services and collaboration advantages, based on grid system of mobile learning of the main functions of the learning environment should include content based on the wisdom of adaptive transmission, and mobile collaboration environment perceived support. Mobile learning systems in service-oriented application design system design methodology is a better choice and is conducive to resolving the mobile learning system faces immediate accurate information retrieval and transmission resources, different system resource sharing and mobile collaboration to facilitate the further expansion of the system and transplant.

$$d(k) = \frac{a_0 c(k) + a_1 r(k) + a_2 t(k)}{a_0 + a_1 + a_2} \tag{2}$$

where $d(k)$ is the indexing, $a_0$, $a_1$, and $a_2$ are the weight, respectively, of the sample, as shown in Equation (2).

$$A'(k) = \frac{\gamma_0 A_0(k) + \gamma_1 A(k) + \gamma_2 d(k) + \Delta\gamma_3 s(k)}{\gamma_1 + \gamma_2 + \gamma_3} \tag{3}$$

where $\gamma$ is the weight in $A(k)$, as shown in Equation (3).

The study is from the Central Radio and Television University distance learning system and the national distance education system of public services for construction projects, based on e-Learning Grid developed distance learning system to add mobile access functions of learning resources and services. The initial results of this research will be applied in the National Nature Fund research project "grid computing and e-Learning Grid" (from Computer Science Department Wuhan University, College of Educational Information Technology South China Normal University, Central Radio and Television University and the Dianda Online Distance Education Technology Ltd), follow-up research, grid-based mobile learning system prototype development, deployment, testing, application and evaluation of research, and further certification based on the grid system design mobile learning theory analysis models, functional structure models and system design methodology scientific, rationality and effectiveness, and on this basis for improvement.

## 3 Model

Theory and method of web-based intelligent tutoring system (`VINCOL) was mainly studied in this thesis. The scope of this study includes collaborative learning, web setting, intelligent instruction, and CSCL (Computer Supported Collaborative/Cooperative Learning). Some research methods, e. g. literature review, content analysis, questionnaire, logical inference, inductive deduction, and system modelling were utilized into this study [6].

$$IP_{\min\_style} = \sqrt{\sum_{j}^{EAV} (v_i - P_j)} \tag{4}$$

First of all, the research status and development trend of current collaborative learning research in our and other countries was reviewed. Then the basic study scopes, purposes, and methods were utilize in this thesis were introduced. The basic framework of collaborative leaning theory was formed by literature review and content analysis in this field. The relationship between collaborative Teaming and cooperative learning was deeply analyzed from derivation, notion, task solving, and evaluation, etc. Meanwhile, the grounding theory and method was constructed after CSCL, ITS, intelligent agent, and learning technology standards was studied.

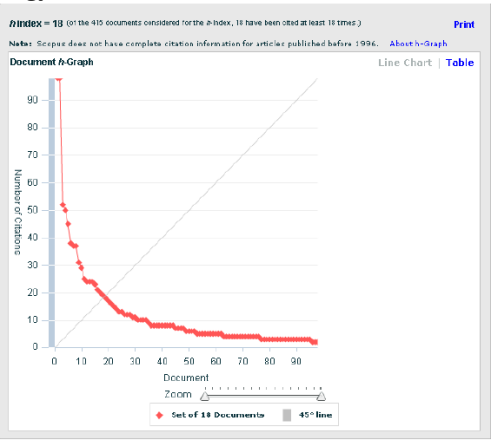


FIGURE 3 h indexing

The relationship between h indexing is shown in Figure 3. Collaborative Teaming can be specified classroom-based (face to face, FTF) and web-based in terms of the different setting. Fundamental, organized methods and strategies, evaluation, and process control in classroom-based collaborative learning already is matured enough. Web-based collaborative learning research is just on the beginning and carrot compare with classroom-based collaborative learning. Influential factors in collaborative learning process are very important for to improve the learning effect and to contact web-based intelligent collaborative learning system. So how to get these factors became a big issue in this field study. Theory and methods of classroom-based collaborative learning can be utilized to guide WINCOL system construction in terms of oho differentiation of influential factors between classroom

setting and web setting. So the factor analysis method was utilized to get theses factors. The result of factor analysis is there are 12 components in classroom setting and 13 components in web setting. Further analysis for these components can get more results which negotiation and communication among group mates, active interdependent, learning content selection, individual and group skills, arid dealing with collaborative learning; conditions should be more concerned in classroom setting, and group learning production, duration of collaborative learning process, role play, learning position, skills, motivation and positivist, effect of collaborative learning in instruction and students fostering should }e concerned in web-based setting. Further more, group learning organization in collaborative learning process is more concerned m classroom setting and effective collaborative learning process is emphasized and the group learning; process is the same situation in web setting.

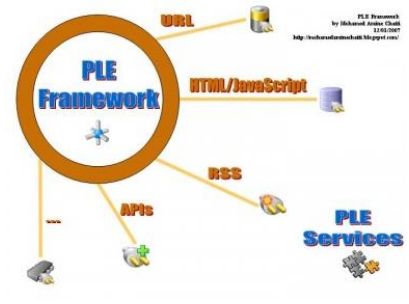


FIGURE 4 Frameworks, by Mohamed Amine Chatti

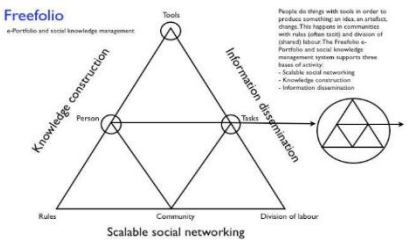


FIGURE 5 Freefolio ePortfolio and social knowledge management system

Framework, by Mohamed Amine Chatti and Freefolio ePortfolio and social knowledge management system are show in Figure 4 and Figure 5, respectively. A web-based collaborative learning theory framework is posted in terms of the study for fundamental collaborative learning theory system, development theory of web-based setting collaborative learning system, and factor analysis for classroom-based and web-based collaborative learning. Individualization, social collaboration, and knowledge construction is described from macro-level in this theory framework and a three dimension model of individualization, social collaboration, anti knowledge consumption' is formed. The relationship among these three dimensions is direct proportion in terms of this theory framework, which it can be utilized to face to face setting (classroom-based) and five basic components of collaborative learning which is described by Johnsons (Johnson, & Johnson, 1999) can be involved into this model, as shown in Equation (5).

$$IP = \min \frac{\alpha \cdot IPi_{\min\_style} + \beta \cdot IPi_{\min+fun} + \chi \cdot IPi_{\min\_conv} + \delta \cdot IPi_{\min\_midum}}{\alpha + \beta + \chi + \delta} \quad (5)$$

Peer model are the foundation and core to construct the intelligent collaborative learning system due' to it is the representative of the theory, strategy, and method of how to simulate to acclimate learner. A cognitive-student-model-based buggy model was built in this thesis which learner's knowledge level and learning status and cognitive ability could be described. Remediation can be adopted in terms of learners' knowledge buggy and error during their learning process. Peer model includes elemental peer mode) and dynamic peer model, which elemental peer model can be built in teen of the pretest score and register information which learner participated in and gave, and which dynamic peer model can be built in terms of modifying elemental peer model according to learner's learning status, performance, feedback, etc during she or he attended collaborative learning process and focus on a certain objective in the system setting. Dynamic peer model is more adaptive learner's real learning status. Personal identity, knowledge level, cognitive ability, and individual differentiation (e.g. leaning styles, intelligence differentiation, gender, etc) is involved in peer model in WINCOL system.

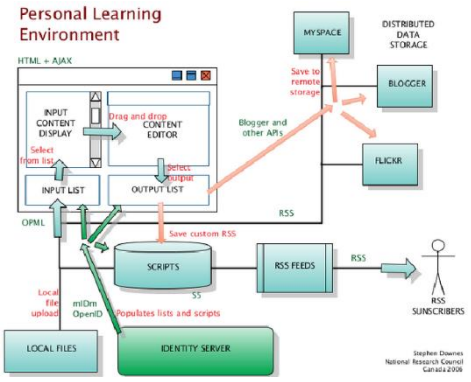


FIGURE 6 Personal study environments

How to realize to simulate collaborative learning process is the essential to represent MOOC system design. The method to build collaborative learning process was explored in teen of to simulate MOOC process as an example in this thesis. Teacher (Tutor) modelling method is also described in this thesis. Tutor model construction provided a basis for to realize teacher participate in collaborative learning process, which involved personal information, instruction calendar, teacher role, instruction tutor, instruction monitor, and teacher history record. Virtual teacher agent which involves assistant agent, monitor agent, evaluation agent, and administration agent is also described in MOOC system. Personal study environments are shown in Figure 6.

Components design also is explored in this thesis, which involves knowledge expression and presentation, collaborative learning strategy, evaluation and reasoning, collaborative learning tools, and data base in MOOC system. Curriculum and problem solving knowledge is involved in MOOC system. Regarding curriculum knowledge, content selection, organization structure, representation and

application is involved, and for problem solving knowledge, problem selection, presentation and application strategy, evaluation, and student model is involved. How to represent the collaborative learning strategy is studied in collaborative learning strategy section, e.g., promoting effective communication strategy among learner mates, rate playing strategy, utilizing learning resource strategy, utilizing collaborative learning skills, fostering group mates commitment strategy, and conflict solving strategy, etc. Evaluation methods and reasoning rules of collaborative learning are mainly explored in evaluation and reasoning section. Evaluation methods of collaborative learning in MOOC system is a overall method, which it includes knowledge diagnosis, research report synthesis assessment, collaborative learning observation, social skill assessment, working habit and individual development assessment, project qualitative assessment, learning log assessment, student self-assessment, test (collaborative group test and group discussion test), etc. Main foundation of evaluation standards is the objective and learning agreement which was made by group members. Reasoning mechanism are some reasoning rules and strategies, which involve knowledge acquiring, learning status diagnosis, collaborative learning strategy utilization, working and feedback mechanism of agent, etc. 16 collaborative learning tools are determined in terms of analysis the utilizing learning tools in current system for MOOC system. E-R diagram was described for data base in MOOC system, which involves peer model database, student record database, collaborative structure database, collaborative learning knowledge database, collaborative teaming resources, collaborative learning rules, and buggy database, etc.

## 4 Conclusion

The main contribution and innovation embodied in the following three aspects: (1) Research on theory analysis of mobile learning system based on grid from the perspective of education. The thesis elaborates the shift of the instruction design ideas from the traditional classroom environment focusing on course, E-Learning environment with fixed desktop computers focusing on learners， to mobile learning environment focusing on learners' activities, and builds the theoretical analysis model to guide the design of mobile learning system based on grid, which have the attributes of focusing on learners' activities, being practical problems-oriented in learners' lives and work, having the ability of context aware. (2) Research on the functions of mobile learning system based on grid from the perspective of education and technology The thesis points out that the intelligent adaptively of learning content transmission, learners' context aware and collaboration support of mobile learning is what mobile learning have the ixia function, the application of grid is the ideal technology solutions for realization of these functions, and builds a functional structure model about mobile learning system based on the grid. (3) Research on mobile learning system based on grid design from a technical perspective. By applying service-oriented approach in mobile learning system design in order to solve the problem of immediate accurate information and resources retrieval and transmission, resources sharing in different system and collaboration support that mobile learning system faces. The thesis elaborates the principles of intelligent adaptively, context aware and collaboration support of the mobile learning system based on grid, and explores mobile learning system based on grid design methods from the three aspects.

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