Investigation into the Android-based Mobile Learning System[*]

Yuefang Sun

School of Foreign Languages, Jining Medical University, Jining, Shandong Province, China

Abstract—**With the rapid development of information technology and the wide usage of portable mobile devices, such as, smart phones, tablet personal computers, and the like, reforms on teaching method and learning system are going on more intensely. Due to more and more e-products available, a new round revolution has sounded the long horn. Mobile learning system has come to be a smart learning system which is getting more and more popular among people. Mobile learning system has set people free from the limitation of learning time and space, which is bound to improve the learning efficiency. This essay has analyzed the learning situation of non-English majors in Medical University, stated the technological support of this learning system , analyzed the feasibility of the system, predicted the potential obstacles, and put forward the advantages and the necessity of the wide usage of the mobile learning system based on Android.**

Index Terms—**portable, smart phones, feasibility, mobile learning system**

I. Introduction

With the explosion of information, 21st century has seen the rapid development of information technology, especially the Network information technology. The Internet has provided people with more and more platforms: shopping, communicating, travelling, studying, and the like. At the same time, the rapid development of science and technology also makes the cost of mobile communication devices much lower, and enables more and more people can use smart phones, laptop computers, and other handy mobile communication devices. As the network technology gets more and more mature, the network signal is becoming stronger with extensive coverage, and people can be on line anywhere anytime through Wi-Fi, which has been the technological support as well as the support devices for people to apply the mobile learning system.

II. The Concept of Mobile Learning

As to the definition of mobile learning，"M-learning" or "M-education" is often used in western countries, while it is often describes as "M-education" in China. In Finland, in the research by   Ericsson, Insite, Telenor Mobil and IT Fornebu Knowation, named "Telenor WAP Mobile Learning " , people defined it as : it's a new way of learning carried out on mobile terminal devices due to the fact that people experience more geospatial mobility and the demand for the flexibility of study is stronger.

Mobile learning has developed rapidly on the basis of distance learning and e-learning. Distance learning can make teachers and learners apart from each other in terms of space, that's to say, the learners are not confined to designated classrooms any more, but in the process of learning, learners can only accept what are taught negatively due to the lack of communication between teachers and other learners. Strictly speaking, there is no timely communication. E-learning mainly refers to learners are taught with the help of multimedia devices in the classroom and the Internet; Meanwhile, teachers and learners can communicate in time through the Internet. However, computers and network terminals are not available anywhere anytime. But these problems are well handled by the mobile learning system. Because the medium of mobile learning system is the widespread mobile communication devices, which means learners can carry on their learning anytime anywhere. There is no doubt that mobile learning system makes study a socialized and lifelong thing.

III. The Status Quo of Non-English Majors in Medical Schools

A. Single Curriculum and Limited Periods

Compared with universities, medical colleges only provide their students with two years' English lessons with three to five periods per week----one for listening course, two or four for Integrated Course. That's to say, students only learn English in their first and second college year with two courses. There are four terms in these two years. Students have to meet the basic demand of College English Curriculum Requirements by the national Ministry of Education through two years' English learning. In most medical colleges, the criterion to test the results of students' English learning is whether they can pass College English Test Band Four (abbreviated as CET4). However, with the development of society, the

more frequent international communication becomes, the stronger the demand for mastering foreign languages is. The desperate crying for comprehensive talents asks students not only to master the skills of reading and writing, but also to improve the practical abilities of listening, speaking as well as translating. Students with high marks but low practical abilities are less competitive now.

For medical majors, apart from basic English knowledge, they also need to learn medical English. But the truth is that there are so many medical curriculums to learn that it's almost impossible to set up other medical English curriculums, let alone the curriculums useful to improve students' practical abilities of English. The present arrangements of curriculum and periods make it impossible to improve these abilities, so students are desperate for a platform to study efficiently.

B. The Lack of Diversity of Teaching Contents

In medical colleges, what students learn is all related to medical knowledge, but there are different majors. The public English subject they learn can merely provide them with basic English knowledge, not the specific learning according to their different majors. As a result, the teaching contents can't meet the demands of all students for the specific knowledge, which makes students lose interests in English learning because they think it's of little help to them. Most medical majors have a strong desire to pursuit postgraduate study after they end their college study. And due to the rapid pace of reform and opening as well as more and more better-off families, many students want to study abroad. So there will be a demand for the English learning of the postgraduate study and the IELTS. What they learn form the present College English can't help them to succeed in passing the IELTS or TOEFL. Even though students in the same class have different demands for English study, let alone students in different majors. While almost all teachers are required to teach the same book with the same space, which makes it impossible to meet their specific demands. Consequently, there are low attendance and the increasing negative emotions as well as the fading enthusiasm for English study, which eventually have a great effect on the teaching efficiency of English.

C. The Singular Teaching Model

Because of the great number of the students and the limited periods, the teaching and learning process always happens in a big class, that's to say, over one hundred students of two classes attend the class at the same time. It's really hard for the teacher and students to communicate and discuss about what they are learning, nor can that happen between students. Generally speaking, teachers can only teach in the traditional teaching method in which the teacher have to dominate the class rather than students. This so-called spoon-fed education leaves teachers deep remorse and also lets students down, which eventually discount the teaching effect. And the traditional teaching method has driven teachers crazy and made students bored. So reforms not only on the learning style but also on the traditional teaching method are desperately needed to sett off.

IV. THE REFORM OF TEACHING METHOD IN MEDICAL SCHOOLS

A. Raise the Passing Rate of CET4/CET6 to Make Students More Competitive

In recent years, medical colleges have enrolled more and more students, which means more and more medical graduates will compete in the job market. Due to the distinct professional characteristic, there are a few job options for medical majors, which means they will face much fiercer competitions. According to the analysis on medical majors in employment in recent years, employers pay more and more attention to the abilities to command English, and even whether the student has passed CET6 has been treated as the fundamental condition for many employers to decide whether the students will be employed or not. Actually, whether one has passed CET4/CET6 or not has made a great difference to the employment rate and their job options. Let's set Jining Medical College as an example, up to 2015, the sample survey has shown that the employment rate of those graduates passing CET4/CET6 is 27 percent higher than that of those failing CET4/CET6; and that those passing CET6 got 18 percent more opportunities than those only passing CET4 to be accepted by the Grade-A Tertiary hospital, famous pharmaceutical enterprises, or medical institutions. So it's quite clear that the way to get oneself more competitive in job market is to improve your abilities, especially the ability to command English. Since employers pay so much attention to the results of CET4 and CET6, undergraduates should try their best to pass them. As is well known to all of us, four parts---writing (accounting for 15% of the total scores), listening (for 35%), comprehensive reading (for 35%), translating (for 15%)—consist of the CET4/6 examination, so CET4/6 examines the all-round ability of students. When employers look for employees passing CET4/6, they actually are looking for the evidence of all-round ability of a student. Once we know the true intention of employers, we should aim clearly at improving University students' English overall ability to pass CET4/6. University students' English synthesizing capacity are closely connected with the scores of these two examinations, which have a strong link with the competitiveness in the job market, domestic or abroad.

B. Improve the Abilities of Speaking and Translating of Each Student

With the traditional way of English learning, we often pay much attention to the aptitude in reading and listening for test taking, but little attention to the practical ability of translating and speaking. As a result, the English that most Chinese students have learned is "mute English". "mute" vividly depicts the present situation of students' English

learning in which students can do better in writing but worse in oral English. Asked to speak in English, students always have no faith in themselves, and even those who open their mouth to speak often speak disorderly without fluency. The main reason why they are not confident of their ability of speaking is there is a lack of practice in their daily English learning. When medical majors begin their postgraduate study, there will be an urgent need for the ability of translating. Only when they master the skills of translating, can students dig further into the original medical literature in English. That's why supervisors increasingly pay much attention to one's ability of translating when they interview the prospective postgraduates. With more and more academic exchanges in diverse colleges, the "mute English" has become an obstacle that has greatly affected the performance of Chinese medical majors on the international stage. Therefore, it's really urgent for us to improve their practical abilities of speaking and translating.

C. Add Medical English to English Studies

Now many medical colleges merely have laid out the curriculum of basic English, while in the medical colleges with medical English, the learning effectiveness is disappointing. In colleges without medical English, students have trouble in reading medical literatures in foreign language for the lack of medical terms. In colleges with medical English, due to the lack of professional teachers in medical English teachers, the curriculum of medical English exists in name only. Consequently, medical graduates always perform disappointingly when they communicate with foreign patients and when they write medical essays or medical records in English.

There is no doubt that reforms on English teaching must be enforced to get rid of the shortcomings of the traditional English teaching method. On the premise that the professional medical learning can go on as usual, students in medical colleges have a strong desire to learn English anywhere anytime for the limited learning periods. The mobile learning system based on Android can largely meet the demand. This new learning system can help students learn more conveniently because it has combined the traditional video teaching system and audio teaching system with the prevalent mobile communication options. The terminal user-interface is explored based on the embedded operating system: users can send their personal information, the related materials of English learning, and the like to a server through the Internet, and after the careful examination, the processed information will be fed back to Android client.

V. MOBILE ENGLISH LEARNING SYSTEM BASED ON ANDROID

A. The Design Principles of the Learning System

1. Easy operation: The motivation to implement such a language learning system was to utilize the advantages of personalized learning (Duo and Ying, 2012). Integrating mobile learning technology into language classroom is a technological challenge both to teachers and students. So the mobile learning system based on Android should be designed with a clear terminal user-interface and easily operated by users. It enables every teacher easily to distribute students assignments with it after simple training, which will not worsen the problem that there is a serious lack of teachers. When it comes to students, they can enter the system with their mobile communication devices, such as, laptops, smart phones. They can easily get access to the learning system anywhere anytime (no need to download it) through the campus wireless network, then they can finish their first visit to it after the registration.   From then on, they can enter the system anytime anywhere and choose any learning module they are interested in to practice and examine themselves repeatedly. The learning materials can be stored in data, which makes the maintaining of the system easier, too. Chart I and Chart II have shown us how easy it is to operate this system.
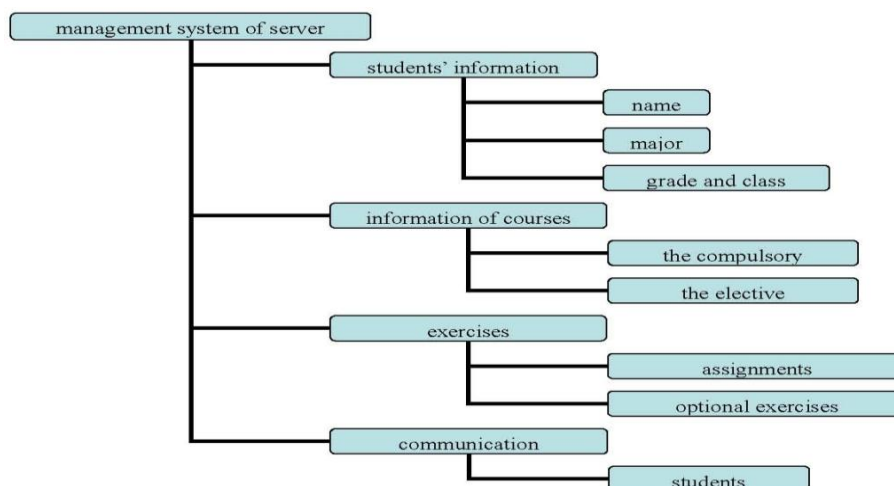

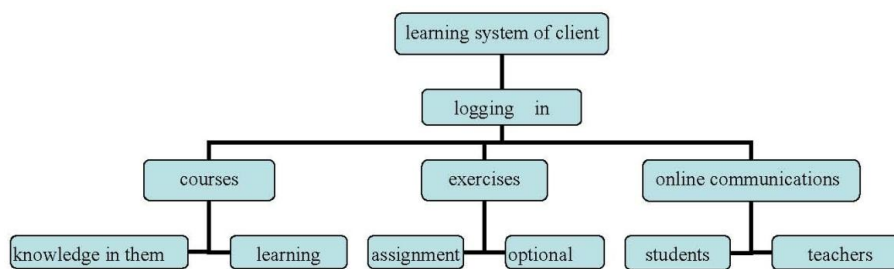Figure 1. The functional modules of server management system.

Figure 2. The functional modules of client learning system

2. Adequate learning materials: Among the most common areas for mobile-based language learning are vocabulary learning, listening tasks, grammar tasks, phonetics and reading comprehension (Miangah, 2012). This learning software is open to all students with different levels, so there should be diverse learning modules: writing, reading, translating, speaking, and so on. Following the same operating systems, they are integrated but relatively independent. What's more, Plug-in interface is also reserved for each program, which makes it possible for users to extend their learning by themselves and to improve and perfect the system in the future. Based on their own learning levels, students can choose different learning modules and different exercises due to the differences between modules as well as exercises. As for the contents, it makes study individual and can meet the demand of all students, to some extent which helps solve the problems caused by limited periods in class.

3. Timely updating information: The learning materials can be updated online or offline. Timely updating of the contents in the mobile learning system enables students can keep up with the latest information, which can help them to study more accurately and competitively in CET4/6 or graduate entrance examination. Students describe English learning in the traditional way as "a boring thing", so the new system should also be interesting to attract students' attention and cushion their languid mood. There are not only the materials to read and write but also the videos to listen and to watch.

4. Flexible hours: Students can learn anytime anywhere which actually extends their learning hours and effectively fix the problem caused by limited learning periods. There are no longer the restrictions in time and space. Since this system mainly helps students learn in their spare time, the content should be brief and small-chunk learning resources are needed. Which can enables students study efficiently even during the short breaks between classes. Herein, the informal and context-based learning experience evolve to important factors given by the mobility of the learner (Traxler, 2007). Of course, there are also comprehensive exercises for students to examine the learning effect after a long time practice. And students can adjust their plan for learning according to the results of test.

5. Smart criteria: There are different levels of criteria for different exercises: the level of CET4, the level of CET6, and the level of postgraduate. After students finish the exercise they chose, the system will grade it smartly and reasonably according to their learning level. Students can get the real feedback of what they are learning , which can helps student to know exactly the result of their learning and encourage them to go on. Students have taken a pretty positive attitude over the mobile learning system.

B. The Feasibility of the Mobile Learning System

1. The prosperity of information technology: In the era of information and technology, mobile learning and mobile business are playing dominant roles. Facer once claimed that most teachers and students，in the U.K.，had then taken mobile technologies a familiar part in their daily lives. In a report entitled The Era of Mobile Learning , Empowering Technologies, a company founded in 1998, aiming at improving personal learning abilities, have pointed out that mobile learning, a new form of digital learning, is expected to be the main way of learning. Surveys conducted with university students show that they own mobile phones that have multimedia and connectivity capabilities in increasing numbers (Cooker et al. 2006). The writer of this essay investigated more than 400 students of different majors in Jining Medical College with questionnaires, including many questions about the learning hours outside the classroom, the frequency of using mobile phones, etc. The findings of the investigation have shown that

Almost 71% students spend half of their learning hours outside the classroom;

About 90% students use Android phones;

Nearly 88% students think learning outside classrooms more efficient;

Over 70% students think the present learning model too unitary

Up to 86% students are bored with the present teaching model

100% students own the mobile devices accessible to the Internet

90% students will surf on line with their phones；

The latest survey shows that smart phone will outnumber the laptop, and that people can browse online without difficulty through wireless platforms. Since the era that phones become the main device for people to surf online has arrived, then it's possible in near future that people can use the mobile learning system as the main learning method.

2. The distinct advantages of Android system: The distinct advantage of Android system is openness, which means the learning system based on Android can be applied to diverse devices. The client system can work smoothly in any

phones, PDA, tablets, and any portable devices installed with Android system. That attracts more and more manufacturers and consumers. Manufacturers would like to invest money in developing it for their support and approval for the Android system, so its user interface has become better with more and more options, which will increasingly offer users more adequate software items. With the trend of mobile learning，many learning materials have been developed，in the form of Podcast，widget，and APPs，while others embed the features of interactions and communication to enhance the effectiveness of language learning by using mobile devices. Kukulskah-Hulme defined MALL- Mobile Assisted Language Learning-as the use of "…mobile technologies in language learning, especially in situation where device portability offers specific advantages (Kukulska-Hulme .2012). In the middle of 1990s，many educators and commercials institutes started to develop the special platform of online teaching, so that teachers can compose and manage their online teaching materials on the platform even if they are not professional for network programming. In recent years, with more and more software available for students to study online after class, the mobile learning system has been implemented in many universities and endorsed by students. Jining Medical College is a good point in case: in order to guarantee the high efficient English learning of students outside classroom, the Foreign Language Department bought the ITEST system for college English practicing and testing developed by Foreign Language Teaching and Research Press (FLTRP), with which anytime anywhere students can carry on their extra-curriculum English learning of writing, translating, speaking, and so on.

C. The Critical Technical Support

Http protocol is used in network communication between client and serve, while data transmission and exchange adopt JSON protocol. JSON (JavaScript Object Notation) , a lightweight data-interchange format, can be easily parsed by browser which supports JavaScript. As a subset of JavaScript, JSON uses a language-independent text format with grammatical format familiar to C language. JSON becomes the standard data-interchange language in the program of smart phones for these characteristics which makes it convenient to read and program, and easy to analyze and generate the information by machines.

At present, as the mobile learning system based on Android is used in many Universities, Most students are satisfied with it. With the updating of information technology, this system will become more and more perfect. It is modern data processing and communication methods that will make this possible on a large scale in the near future. With the rapid development of mobile computing technologies, a new learning style-mobile learning has exploded everywhere in our society, which is considered as an essential learning style in the future.

D. The Prospect of the Application of Mobile Learning System

Having broken through the limitation of time and space, this system can offer users the latest materials with few data, which will arouse the students' new initiatives. Under the help of this system, student can log in directly without downloading the app to learn and improve one's English. From a long term run, it will result into the remarkable improvement of college students' English synthesizing abilities. As long as information technology can benefit language learning，learner's achievement can depend on the accessibility and convenience of a learner's using a mobile device for learning. The only potential obstacle to the implement may be the network speed in the campus. At present, due to the great number of network users (mostly the college students) and the rush hours spent surfing online, it's inevitable that network speed will slow down. Fortunately, information technology has been developing so fast that we hold a firm belief that this kind of problem will be solved as promptly as possible.

VI. CONCLUSION

In the new era, since the project of mobile education has been put on agenda by the National Collaborative Committee on Educational Technology in Colleges and Universities, mobile learning, as the core of mobile education, has attracted the full attention of educators. Now there are still many to be explored in China, because there are few mobile learning systems in line with China's national conditions. The learning system based on Android can be widely used on the portable mobile devices, such as, smart phones, PDA, etc. This system has a distinct advantage of the flexibility in learning time as well as space, the fast-update data, low data flow, etc, which can enable students learn with high efficiency. Therefore, it is of the practical reference value in research on mobile education.

REFERENCES

[1]   Cooker, J.D. Holley, C. Smith, C. Bradley, and R. Haynes. (2006). A Blended M-learning Design for Supporting Teamwork in Formal and Informal Settings. In Proceedings, *Mobile Learning 2006*, July 14-16, Dublin, Ireland.
[2]   Duo,S. and Ying, Z.C.(2012), "Personalized E-learning System Based on Intelligent Agent", *Physics Procedia*, Vol.24, 1899-1902.
[3]   Kukulska-Hulme A. (2012). "Mobile-assisted language learning", in Chapelle, C.A. (Ed), *The Encyclopedia of Applied Linguistics*, Blackwell Publishing Ltd, Oxford UK.
[4]   Miangah, T.M. (2012). "Mobile-Assisted Language learning", *International Journal of Distributed and Parallel Systems*, Vol.3 No.1, 309-319.
[5]   Traxler, J. (2007). "Defining, Discussing and Evaluating Mobile Learning: The moving finger writes and having writ….", *The*

International Review of Research in Open and Distance Learning, Vol. 8 No.2, 1-12.

Yuefang Sun, born in Jining, Shandong Province in 1979. She received the bachelor degree from Shandong Science and Technology University in 2002, and the master degree from Qufu Normal University in 2012.

She is currently a lecturer in School of Foreign Languages, Jining Medical University, Jining, China. She has been teaching in Jining Medical University for seventeen years; courses taught include Integrated English, and Traditional Chinese Cultures (English version); Her research interests include Applied Linguistics and second language acquisition.