

The English Vocabulary using Ubiquitous Learning System

J. Hilda Malar, R.Venkatraman, J. Amutha Monica

Abstract Mobile education is the product of mobile communication technology, network technology, multimedia technology and contemporary education, and it is also the frontier of modern educational technology. Its promotion and development will lead to the transformation of educational technology and educational means. In this paper, the development model of educational software, such as English intelligent local learning system, mobile and mobile education support platform, PDA and palmtop computer, was discussed in this paper, so as to provide a universal learning platform for the study of English words. Using this platform, people can learn English at anytime and anywhere. The main goal of developing English word intelligence all over the world is to enable English learners to learn at any time. Based on the support platform of mobile education systems, many learning activities can be completed. Because of its running time and space limitations, people can study wherever they can, thus achieving the truly ubiquitous learning.

Key words: Education system, ubiquitous learning, genetic algorithm

I. INTRODUCTION

In English practice, usually there will be a plateau with the improvement of English level. When English reaches the plateau level, it is often difficult to achieve new breakthroughs. Vocabulary is a key factor in the improvement of English learning and proficiency. Students often suffer from limited English skills because of their lack of vocabularies, such as reading ability, listening comprehension ability, speaking ability and writing ability. Therefore, English vocabulary has a direct and crucial role in personal English proficiency. Extensive reading system is a new teaching system, and its related design, research and practice of teaching system have become a hot topic in the educational technology. Therefore, numerous studies have attempted to increase the efficiency and performance of learning English vocabulary. The situational learning approach proposed that context is an important consideration in the language learning process and can enhance learner learning interest and efficiency. Restated, meaningful vocabulary learning occurs only when the learning process is integrated with social, cultural and life contexts. With the rapid development of context-awareness techniques, the development of context-aware mobile learning systems, which can support learners in learning without constraints of time or place via mobile devices and associate learning activities with real learning environment, enables the conduct of a novel context-aware ubiquitous learning mode to enhance English vocabulary learning.

Revised Manuscript Received on October 05, 2019.

J.Hilda Malar, research scholar at Vels University, Chennai.

Dr.Venkataraman.R, Professor and Head of the department of English in Vels University, Chennai.

Dr. Amutha Monica.J, assistant professor in Sathyabama Institute of Science and Technology for over a decade.

Ubiquitous learning enables learners to learn at anytime, anywhere through wireless network environment using context-aware techniques. The meaningful knowledge is constructed only when learning process integrates with society culture and life-context. Here, Genetic Algorithm is being used which plays a vital role in extracting entries in the titles of a library; it can be used as a class label for the target variable. It is highly emerging because they can avoid functional disturbances. In addition, the search scope can be concentrated in the higher part of the search space.

II. STATE OF THE ART

As a combination of digital learning and mobile computing technology, mobile learning is the most direct form, and it can make learners realize digital learning and a series studied of mobile learning resources through mobile devices. The researchers have tried the application of WAP technology in higher education technology of University of Helsinki in Finland, hoping that it can create a mobile learning environment and resources for learners and teachers by teaching and learning at anywhere through WAP or smart Phone [1]. The M-learning project is a mobile learning program funded by the European Union [2]. Quite a few young people between the ages of 16 to 24 in Europe lack basic reading and writing skills, and many young people quitted school without finishing their studies, so most of them have never even received any form of education or vocational skills training. The British government has carried out a deep study of this problem. Starting with the analysis of group characteristics, some researchers have creatively proposed M-learning schemes for mobile technology to provide educational services for them. Electronic learning programs launched by European countries represent students' websites, free downloaded information, or other learning resources for mobile devices. Through mobile learning, the Lear2GO project of California University and the European University allows teachers and students to communicate effectively in the classroom, and it can also be extended to extra-curricular learning, so as to make it more convenient for students to learn [3]. The United States also launched a "Form E-Learning to M-Learning" project, and its focus is improving students' learning and teachers' teaching in the campus through wireless handheld mobile devices, so as to make teaching and learning more modern and information-based [4].

Ministry of education technology in China has also begun to pay attention to the research of mobile education theory and practice. At present, the application of mobile Internet technology in basic education is mainly based on mobile phones, conferences, announcements, school activities, teacher and student activities, notices,



questions and answers, examination results and other information services.

III. METHODOLOGY

A. Extensive Learning

Based on Internet and remote computing technology, anyone can access any information at any time and place based on the development of supercomputers and wireless communications networks (UC) [5]. The emergence of ubiquitous learning has changed our learning. The rapid development of mobile terminals and smart devices, as well as more popular learning, can provide hardware conditions. Ubiquitous learning is a new way of learning, and students can use mobile terminal equipment for learning at anytime and anywhere [6].

Ubiquitous learning has extended the form of education and has enriched the goals of education. Modern society has developed into a society that requires lifelong learning, so people need to learn not just on campus. Traditional learning patterns in fixed places also discourage people from receiving more opportunities for education [7]. The paradigm of learning philosophy and technology learning will be seamless, continuous and open. Education is no longer the prerogative of some people. The impacts of information technology on educational theory and practice are shown in figure 1.

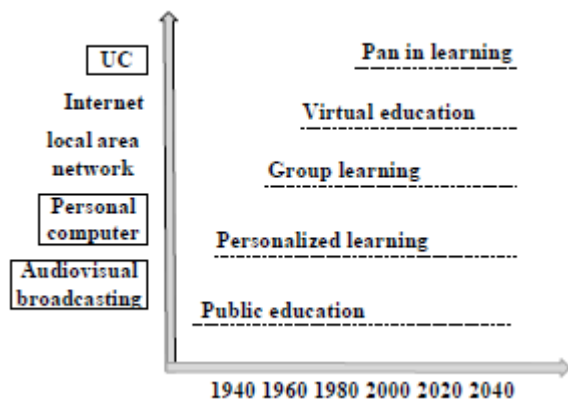


Figure 1: Impacts of information technology on educational theory and practice

B. Genetic Algorithm

In the vocabulary learning system, there are two commonly used search methods:

- (1) The method of extracting entries in the titles of a library is simple and easy. However, this approach tends to make the latter words boring, so learners can easily lose interests [8].
- (2) The drawback of the random selection criterion is that there are many randomness and uncertainty. Some simple items can be repeated many times, but some may not be a difficult word, so the efficiency of memorizing words can't meet the needs of learners. Genetic algorithms have been widely used in global optimization search algorithms in recent years. GA can select the right individual and get the best solution according to the natural law, and it has the intelligent characteristics of self-organization, self-adaptation and self-learning. Therefore, the system uses

genetic algorithms in the dictionary to search for more difficult items, so that the probability of big words can become bigger, while the smaller words are less difficult.

In order to solve various optimization problems, a variety of optimization algorithms, such as simplex method, gradient method, dynamic programming method and branching method, were proposed in this paper. Each optimization algorithm has its own advantages, applications, and limitations [9]. Genetic algorithm (GA) is a robust search algorithm, and it can be used to optimize complex systems. Compared with other optimization algorithms, it has the following advantages:

- (1) Genetic algorithm can be used as the decision variable of target coding. Traditional optimization algorithms are usually used to optimize the decision variables of their own real values, and its concept is only the concept of code optimization, so the coding process can show its unique advantages.
- (2) The genetic algorithm uses the value of the target function directly as search information. Genetic algorithms are very convenient because they can avoid functional disturbances. In addition, the search scope can be concentrated in the higher part of the search space. Through the objective function or personal health, it can improve the search efficiency [10].
- (3) Genetic algorithms can use multiple search sites simultaneously. The traditional optimization algorithm is usually an iterative search process, which solves the optimal solution of the initial point in the solution space. Search information can provide a single search point, but its search efficiency is relatively poor. Sometimes, even the search process is in the local optimal solution, which is stagnant. Genetic algorithms start looking for optimal solutions from multiple individual initial groups rather than starting from a single individual. The selection, cross section, and differences of the group generate a new generation of groups that contain large amounts of group information. This information avoids the need to search for points that do not need to be searched, so it is actually equivalent to searching for more points, which is the only implicit parallelism of the genetic algorithm.
- (4) The genetic algorithm uses probabilistic search techniques [11]. This uncertainty is often not optimal and may limit the scope of the search constraint algorithm. Genetic algorithm is an adaptive probability search technique, and its selection, crossover and mutation have a certain probability, improving the flexibility of the search process. Although this probability attribute may produce some combinations of incompatibilities, as the process develops, the new team will always yield better individuals.

C. Development Model of the Intelligent Ubiquitous Learning System for English Words

Software engineering and instructional design reflect the way of thinking in the system [12]. Through the use of systematic thinking, the proposal and solution of problems usually involve four processes. First of all, problems should be analyzed, and then reasonable design ideas should be presented. Then, the design model should be installed to implement the operations and to solve the problem [13]. When the problem is dealt with, it is necessary to evaluate and summarize the results. Drawing on the



"waterfall" model of software engineering spiral model and instructional system design method, the development model of the intelligent system for the universal English words of "three-layer waterfall" was proposed, as shown in figure 2.

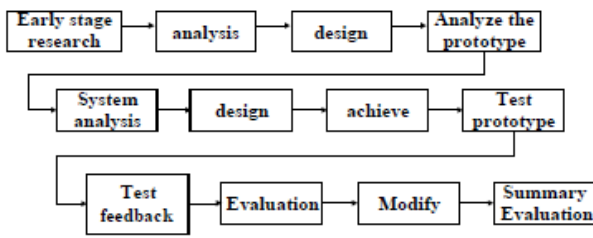


Figure 2: The "three-layer waterfall" model of the intelligent ubiquitous learning system for English words

The first layer: from the theme, the learning contents, learners, teaching objectives, system hardware and software requirements can be analyzed, teaching strategies, media types and curriculum framework can be designed. At the same time, it is necessary to start from the point of view of software engineering to consider the feasibility of the project and the overall framework of the project from the overall point of view. Through the introduction and thinking of the problem at this stage, the feasible primitive model can be preliminarily conceived and put forward. This initial design prototype often contains a profound teaching design philosophy and the key technical features [14].

The second layer: starting from the analysis model, software requirements analysis, system analysis, design and implementation, including the detailed design and coding of intelligent words, should be paid attention to. The result is an intelligent and ubiquitous English word learning system, as well a perfect learning attempt for second prototype test prototypes.

The third layer tests and studies the model [15]. Through the analysis of the test results and the experiment, the feedback information was studied. Problems were identified and appropriate changes were made. The main goal of this phase is to further optimize the software and improve the function of some details. The evaluation of this stage is a key link, as well as an assessment of the overall development process, including the summary of the intelligent learning system for English words and the assessment of the overall development process. The purpose of it is to sum up experience, so as to provide references for future development and the optimization of development model of general learning systems.

D. The method of system analysis and system design for English word intelligent ubiquitous learning system

The unified modeling language is used to model intelligent and ubiquitous learning systems. UML is used to build software system models for different phases of system development.

(3) User requirements

This phase uses use case diagrams to capture the user needs of the entire English learning system. Through case modeling, the English word intelligence can be used to describe the external role of the learning system and its requirements for system functions.

(4) System analysis

The analysis phase focuses on the main concepts of English word intelligence, such as systems, objects, classes, and their relationships. In order to implement the local learning

system in English, static and dynamic models were adopted to describe system structure and system behavior.

(5) System design

Based on the analytical model of intelligent learning systems for English words, algorithm classes that define the technical details of a system, such as user interface classes and intelligent algorithms, were considered. The design phase provides a more detailed design description for the implementation phase.

(6) System implementation

The task of the implementation phase is to use object oriented programming language to transfer from the design phase to the program code and to use the component diagram to describe the English word code components.

IV. RESULT ANALYSIS AND DISCUSSION

A. Demand Analysis

For ubiquitous learning systems, there are two basic use cases: word learning and practice. Previous users might want to set up some settings for the system when learning words. For example, they can choose the proper list of English words for the user, select the personalized window interface, and set up the word learning task. These requirements can be defined as use cases of "user settings". Learners must see their academic achievement requirements after learning vocabularies, so the "view results" use case is used.

In the learning process, it is necessary to find two use cases, such as "word learning" and "word preview". The interaction between learners and systems, as well as the functional requirements of learners and administrators are described, and a system use case model is established, as shown in figure 3.

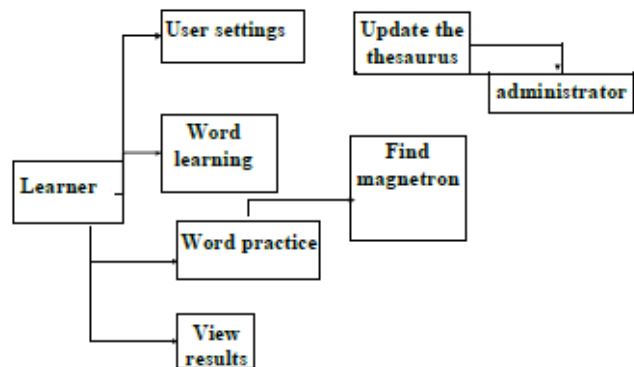


Figure 3: Use case diagrams for English word intelligent ubiquitous learning systems

B. An Analysis of the Hardware Environment of the Intelligent Ubiquitous Learning System for English Words

Learning system has the following characteristics: (1) learning users rarely change learning resources. (2) Part of the learning content may be the difficulty or interest of most learning users, so the frequency of requests is relatively high. Therefore, the ubiquitous learning system should make full use of mobile database technology to store English libraries in the Chinese teaching server, vocabulary, voice database and vocabulary test library.



Considering the above features, the hardware environment of the learning system is mainly composed of Internet, mobile education network, learning platform and teaching server, as shown in figure 4.

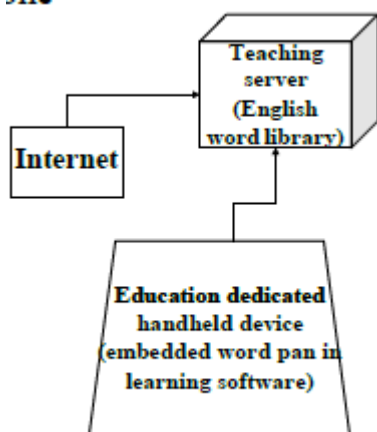


Figure 4: The hardware environment of English word intelligent ubiquitous learning system

On the learning platform: mobile devices such as education, handheld devices and PDA are embedded in platform devices to learn system software.

Mobile Education Network: the network is part of the entire mobile network, which is composed of multiple sites for sending or receiving information from mobile stations and the internet. Through the air interface, it can realize the seamless connection between the mobile station and the internet.

The Internet: the Internet here is the usual sense of Internet. In modern society, the Internet has developed into one of the most effective carriers of educational resources. With the continuous development and maturity of Internet technology, through various mobile devices, customers can connect with the Internet at anytime and anywhere, and then quickly access to English learning materials on the internet. For example, through the Internet, they can exchange information and download vocabulary libraries.

Teaching server: the server can connect to the Internet and store rich lexical dictionaries to facilitate user access. From the point of view of mobile education system, the Internet and teaching server are the main carriers of educational resources. Translation learning platform and mobile education network are the main media to connect users and the Internet, and they make mobile education system unique.

V. STATIC MODEL OF ENGLISH WORD INTELLIGENT UBIQUITOUS LEARNING SYSTEM

In the use case example, the English word intelligence has the following basic functions:

- (1) The system designed in this paper can memorize the customer's learning process, and do statistical analysis on the effect of customer learning.
- (2) The system can realize real-time monitoring of the effect of English learning by customers, and through the statistical analysis of the stage, it can give the customer the evaluation and summary of learning effects, so as to supervise and help customers improve the learning and memory efficiency of English words.
- (3) The system has a good user interface and rich customer

operations, so it can continue to stimulate enthusiasms customers for learning English words, so as to improve their learning interests and to achieve better learning effects.

- (4) Through intelligent adaptive genetic algorithm, the system can reasonably arrange the customer's learning plan and learning time, so as to achieve the best effect. The system uses text a to speech or TT technologies for text reading, so that users can train English listening at the same time.

In order to satisfy the functions of the above system, the system should have the user set class, word learning class, word practice class, view class, search class and genetic algorithm class.

Users can use a class to set up some user information that includes the information needed for word learning and word practice, as well as the user's personal information. Word class is the core course of the system. This course can realize vocabulary learning, vocabulary reading, intelligent selection, system control management and level change of difficulty in vocabulary, and other functions. The vocabulary exercise class can implement intelligent test paper, answering, and preservation of historical papers and other functions, and can view the performance, and search for the required English words, English words and data needed for the English speech database and the test library. The genetic algorithm has realized the intelligent search function. With the class diagram shown in figure 5, the static model of the system is created.

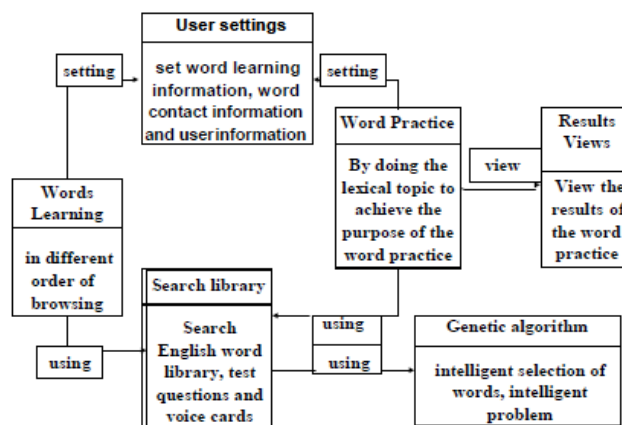


Figure 5: Class diagram of English word intelligent ubiquitous learning system

VI. DYNAMIC MODEL OF ENGLISH WORD INTELLIGENT UBIQUITOUS LEARNING SYSTEM

In a learning system, the dynamics of an intelligent vocabulary is used to describe the behavior of an object, that is, the transformation between all possible states and transition of states of various events.

First of all, the states of the learning process of English words are divided. The first stage is the initial learning state. With the initial learning objects, the state of words is set. In the beginner state, customers have two settings options, including users' personal information and words that the client plans to learn. In the second stage, customers can enter the stage of real word learning from the initial



setting. At this stage, three types of customer actions can be implemented: learning of English vocabulary; adjustment and improvement of the difficulty of words learning; the completion of word learning tasks according to plans. In learning, the request event is shifted to the search state. In the state, different search methods are used to search and find information, and then they are transferred to the word learning state. The learning state and the search state are communicated back and forth until the completion, and then they shift to the final state.

English word intelligent ubiquitous learning system makes the moving object of a word to shift from its initial state to the set state. The state consists of two activities: the setting of user information and the setting of word practice. From the setting state to the literal practice, there are three kinds of activities: in this state, vocabulary exercises, evaluation and modification of the difficulty, and vocabulary training tasks will be transferred to the final state. At the beginning of the word practice, the first "question" request will be sent to the search state. In this state, the intelligent test set algorithm is used to test the activity of paper. When the word task is completed, it will move to the final state or move to the view state. Among them, users can view the exercise report and transfer the results to the final state.

VII. CONCLUSION

The goal of developing English word intelligence all over the world is to enable English learners to learn at any time. Based on the support platform of mobile education systems, many learning activities can be completed. Because of its running time and space limitations, people can study wherever they can, thus achieving the truly ubiquitous learning. In this paper, the implementation of intelligent word selection in English intelligent learning system was discussed; a scheme which uses the genetic algorithm to solve the intelligent word selection was put forward; the design and development process of the intelligent learning system in general English words were described. The researches of this paper can provide references for the design and development of mobile learning software systems.

REFERENCES

1. Liu C. (2013), Analysis on the design patterns of cloud computing in mobile learning systems. Proceedings of the 2nd International Conference on Computer Science and Electronics Engineering (ICCSEE 2013). Paris, France: Atlantis Press. 10(1). 21-22.
2. Chong J L, Chong A Y L, Ooi K B. (2011), An empirical analysis of the adoption of m-learning in Malaysia. International Journal of Mobile Communications, 9(1). 1-18.
3. Welsh E T, Wanberg C R, Brown K G. (2003), E-learning: emerging uses, empirical results and future directions. international Journal of Training and Development, 7(4). 245-258.
4. Keengwe J, Bhargava M. (2014), Mobile learning and integration of mobile technologies in education. Education and Information Technologies, 19(4). 737-746.
5. Stephens M. Learning everywhere. 2012. 48-48..
6. Yamat H, Fisher R, Rich S. (2014), Revisiting English language learning among Malaysian children[J]. Asian Social Science, 10(3). 174.
7. Liu P H E, Tsai M K. (2013), Using augmented- reality- based mobile learning material in EFL English composition: An exploratory case study. British Journal of Educational Technology, 44(1).
8. Cavus N, Al-Momani M M. (2011), Mobile system for flexible education. Procedia Computer Science, 3. 1475-1479.

9. Lin C. (2014), Learning English reading in a mobile-assisted extensive reading program. Computers & Education, 78. 48-59.
10. Ozdamli F, Uzunboylyu H. (2015), M – learning adequacy and perceptions of students and teachers in secondary schools. British Journal of Educational Technology, 46(1). 159-172.
11. Leong L Y, Ooi K B, Chong A Y L. (2011), Influence of individual characteristics, perceived usefulness and ease of use on mobile entertainment adoption. International Journal of Mobile Communications, 9(4). 359-382.
12. Gan C L, Balakrishnan V. (2014), Determinants of mobile wireless technology for promoting interactivity in lecture sessions: an empirical analysis. Journal of Computing in Higher education, 26(2). 159-181.
13. Mahat J, Ayub A F M, Luan S. (2012), An assessment of students' mobile self-efficacy, readiness and personal innovativeness towards mobile learning in higher education in Malaysia. Procedia- Social and Behavioral Sciences, 64. 284-290.
14. Lin S P. (2011), Determinants of adoption of mobile healthcare service. International Journal of Mobile Communications, 9(3). 298-315.
15. Ho C T B, Chou Y T, O'Neill P. (2010), Technology adoption of mobile learning: a study of podcasting. International Journal of Mobile Communications, 8(4). 468-485.

AUTHORS PROFILE



I am J.Hilda Malar, research scholar at Vels University, Chennai. I have a decade of experience in teaching English in both Engineering and Arts and Science colleges. My area of research is Indian Literature.



I am Dr.Venkataraman.R, Professor and Head of the department of English in Vels University, Chennai. I have decades of experience in teaching literature and expertise in guiding the M.Phil and Ph.D students in their research. Published more than 9 articles & 10 books in literature. My areas of specialization are: Canadian Literature, Translation, History of English Language and Linguistics.



I am Dr. Amutha Monica.J, assistant professor in Sathyabama Institute of Science and Technology for over a decade. I have published in reputed Scopus and Web of Science journals. My area of research is American Literature.