PERFORMANCE – BASED SYSTEM FOR LEARNING CHINESE CHARACTERS

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ABSTRACT

Chinese language is based on characters and different set of grammatical conventions. This study aims to develop a task-oriented learning platform, and individualized path that generate correspond to each student performances. However, the scope will be focusing on learning Chinese characters. Questionnaire was distributed to a class of students who have completed Mandarin Language course in order to identify issues in learning Chinese character. Previous studies related to learning Mandarin Language or Chinese Characters and adaptive learning were reviewed. A prototype was developed to collect reviews and testimony from users. Data collected were used to improve the prototype. Based on the feedbacks, majority of the system user agree that this system gain their interest to learn Chinese characters. The system’s learning mode, where all student need to pass a quiz before able to continue to the next lesson received positive feedbacks from most of them. This system is preferable compared to conventional classroom learning.

Field of Research: e-learning, performance-based, Chinese characters.

1. Introduction

Learning Chinese characters is considered as the most challenging part. However, apart from learning in classroom, student does not being provided any supplement tools in learning Mandarin, especially on learning Chinese characters. In addition, there is no any existing online learning system that focusing on Chinese characters. Researchers have provided evidence to support the idea that providing visual cues for recall results in better learning performance (Shen and Ke, 2007). The most frequently used strategies are orthographic-knowledge based strategies which make use of the three aspects of radical knowledge, namely graphemes, semantics and phonetics (Shen, 2005). Similarly, (Taft and Chung, 1999) mentioned that emphasizing radical structures when the Chinese character is first encountered, is the most effective way to build a relationship between character and radicals. Additionally, well-designed multimedia is beneficial to beginners (Lee, Shen and Lee, 2008; Chen, et al., 2014). The adaptive navigations were later classified as direct guidance, sorting, hiding, annotation, and map adaptation. Most of these, support technologies introduced by early adaptive hypermedia systems based on manual page indexing and provided navigation support within a closed corpus of documents (Brusilovsky, 2001). Therefore, the purpose of this study is to design a learning system on Chinese characters for beginner. The learning system will provides lessons solely on Chinese characters. It is widely accepted that learning Chinese is much more difficult than learning other alphabetic languages and the main obstacles is learning to read and write characters (Yan et al., 2013). Differing from learning Malay and English Language in Malaysia, Chinese characters are non-alphabetic but rather ideographical. In Universiti Malaysia Sabah, Chinese Language is being offered to students as a foreign language. However, the curriculum
provided by the lecturer is broad where students will learn the skills in speaking, reading, listening and writing in Chinese and hence the learning on characters is not being emphasis. Therefore, learning strategy is designed in this study where a student will learn basic lessons in the beginning. At the end of the lesson, student will have to answer quiz and additional exercise will be given if student failed. Students will have to take another quiz and pass to proceed to the next chapter. With the advancing of technology where all kinds of educational applications been enriching, personalization in teaching and learning are possible to happen through adaptive learning. Since there is no learning system available in Universiti Malaysia Sabah, this study took a chance to provide a learning technology which can deliver individualized lessons to students. With this system, lecturer can strengthen the teaching process and student may spend more time focused on learning the Chinese characters. Hence, this study hopefully will provide a task-oriented learning environment where students get to practice and utilize lessons they have learned from the system by doing exercises and answering quizzes.

2. Adaptive Learning Technology

According to (Fleming, 2015), adaptive learning system empowers students to meet learning goals and helps educators to improve the process of teaching and learning. (Truong, 2016; Chou et al. 2015) described that adaptive learning happens when the system controls the adaptation where the system itself will detect the students, builds a student model to represent the system beliefs of the student, and provides the student with adaptive learning supports, such as learning materials, learning sequences, peers, tools, feedback, tutoring, interface, and presentation. Adaptive learning has been proven useful by the Open Learning Initiative (OLI) at Carnegie Mellon. A study published by the Journal of Interactive Media in Higher education found no significant difference in exam scores for students enrolled in Open Learning Initiative’s introductory statistics course which contains adaptive learning compared to the traditional course. Furthermore, the study also found that the OLI students took 50% less time to learn all of the content and also perform the same or better relative to the traditional students (Lovett, Meyer, and Thille, 2008). Therefore, providing a learning system that can adapt to the student performance may enhance their ability to learn in class.

3. Review of Similar System

3.1 XCN Chinese

Lessons are given by different phases which started from beginner until intermediate level where user able to make sentences. Even though this web site also provides Chinese characters learning, it does not interact with the user. This site does not provide medium for the user to send feedback or take quizzes to assess students’ performance. Figure 1 shows the interface of the first lesson on Chinese characters provided by XCN Chinese.

3.2 Arch Chinese

There are few interesting features here that can be extracted in order to develop a good Chinese characters learning system. Figure 2 shows the page where it provides animate stroke orders for Chinese characters. User also is able to generate character writing worksheets with stroke sequences, radicals, English definitions and Pinyin in PDF format for offline handwriting practice. Similar to XCN Chinese, this site does not interact with the learner as there are no tasks given at the end of each lesson.
This system will not evaluate each student performance and hence unable to prepare an individualized path of learning through the lessons. However, implementation of flashcard in delivering the lesson show significant advantage in faster accessibility since video needs bigger space of data.
3.3 Open Learning Initiative by Carnegie Mellon University

Open Learning Initiative by Carnegie Mellon University (or, OLI) was designed to provide online courses with the purpose of linking learning experiences to course performance and outcomes in more quantifiable ways. The Elementary Chinese 1 course offer lessons, activities, practice, and feedbacks. The lessons given in the system applied various media including audio, picture and video. Figure 3 shows exercise for unregistered users with feedback but without score. Only registered users will be able to do exercise contains in the system with immediate feedback and view their score. According to the course details, the learning Chinese characters unit is located at the end of the course content. Thus, this online course aims to develop communicative competence rather than focusing on specific learning unit such as Chinese characters.

![Figure 3: Example of exercise for unregistered user](image)

4. Prototyping Model

Prototyping model is selected as the methodology in developing the learning system. This model includes the phase of analysis, design and implementation concurrently in order to develop a prototype where the very basic requirements are provided to the user. The prototype will be reviewed and the phase of analysis, design and implementation will repeat until all the requirements are met in the prototype and hence the last implementation will take place. Figure 4 shows the phases of developing the Chinese characters learning system.

4.1 System Planning Phase

Questionnaire was distributed to the students currently taking or has taken Mandarin language in order to identify problems they encounter in learning Mandarin and Chinese characters. Studies on previous researches related to learning Mandarin language and Chinese characters and adaptive learning are also performed in this phase. This also includes reviews on similar learning system in order to define the scope of the system.
4.2 Analysis, Design and Implementation Phase

Results from the study conducted in planning phase were analyzed and the information is used to define functions and operations in the learning system. The strengths and weaknesses discovered from the reviews of similar systems were considered as guide for the developing the learning system. They are useful in designing the form of operations, structures of interface, features and system functions. Three components involved in designing phase are system architecture design, database design and user interface design. Figure 5 shows the context diagram for the learning system developed in this study, Chinese Characters Learning System (CHICALS).

Figure 4: Phases in Prototyping Model

Figure 5: Context Diagram
Context diagram in Figure 5 describes the type of interactions between each user (students, lecturers, and system administrator) and the learning system. Functions provided in the system for each user type are described in section 4.3 and section 4.4.

4.3 System Prototype Phase

System prototype was developed before the system implementation being preceded. In this phase, only main system scope was developed. The initial prototype was reviewed by users. It is then was revised in order to have an upgraded version. This is also the phase where user plays their roles in the development process. Their input is one of the important sources for developing the learning system considering required functions. Figure 6 shows a feedback page after student fail to score passing marks. Students will be directed to exercise page shown in Figure 6 if they failed a quiz. They need to complete the exercise and re-take quiz before proceeding to the next level. Figure 7 shows the page for lecturer to manage content of the course. In this phase, lecturer has the authority to add contents, edit content as well as delete any contents they have created. Contents managed by lecturers include the lessons, quizzes and exercises. Any registered user may interact with others through the chat function. It provides a platform for students to inquire about unclear topics as well as enable interaction with other students and lecturer. Figure 8 shows a page to manage user by a system administrator. The system administrator add user to the system hence give permission to new registered user to access the content of the learning system. The scope for system administrator also includes viewing user information in the system.

4.4 System Implementation Phase

In this phase, the learning system has entered a cycle of analysis, design and early implementation. Feedbacks from the users were used to re-design accordingly. In the initial evaluation, users questioned about the method of interaction available while using the learning system. They requested to have a communication channel between all users including the lecturers.

![Figure 6: Quiz feedback page](image-url)
Thus, a chat box was later added as shown in Figure 9. The chat function is located at the bottom of the right side of the page.
5. Conclusion and Future Recommendation

In this study, CHICALS, a performance-based learning system is developed. It was designed to provide learning Chinese characters with a task-oriented platform, and individualized path that generate correspond to each student performances. Developed based on prototyping model, inputs from users are crucial to the learning system development. However user acceptance test is recommended to assess its usefulness, ease of use and users’ attitude towards usage (Davis, Bagozzi, and Warshaw, 1989; Lee, Cheung, and Chen, 2005)
References


