

The Relation between Students' Anxiety and Interest in Playing an Online Game

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Abstract-- Over the past decades, the education of students has progressively shifted from the traditional teaching environments to technology-assisted settings. In Taiwan, the preference to provide students with multimedia in environments shared by their peers is gaining acceptance and public attention. Therefore, "Chinese Idioms String Up Puzzle game," a new text reconstruction online program was developed by the Digital Game-Based Learning Laboratory, National Taiwan Normal University in Taiwan to encourage students to use their organizing schemes to learn Chinese Idioms. A survey was conducted to examine participants' anxiety, interest and cognitive load by using this new computer-assisted game. According to the survey, students felt this new program is interesting and would like to play again in the future. For those students who believe anxiety helps their performance, and for those students whose degree of anxiety lowered after completing the test, they tended to have greater interests in playing the game. Findings of the Partial Least Squares (PLS) contribute to an expanded understanding of both psychological anxiety and somatic anxiety influence their cognitive load, whereas both anxieties was not significantly related to their playing interest. In addition, the study results indicated that the higher degree of psychological and somatic anxiety, the greater cognitive load participants had.

I. INTRODUCTION

In this modern society, people including children and adults interact with computers in all settings almost every day. Some evidence indicated that computer-assisted educational games could be used for learning and they are more effectively than traditional methods [1]-[2], in other words, interested students will learn more in educational settings. Moreover, past studies supported that playing games make our brains work efficiently and take in more cognitive materials than we do in traditional settings [3]-[4].

Additionally, in this technologically dependent society, people seek to improve human performance, get higher productivity and increase user satisfaction with technologies. In Chinese society, Chinese Idiom learning plays an important role in vocabulary learning which cultural and social functions involved in. Teachers that may have problems to provide each student with individualized program that each student has interests in that program [5]. Therefore, we, the Digital Game-Based Learning Laboratory supported by National Taiwan Normal University in Taiwan, developed the "Chinese Idiom Puzzle game" to trigger students' interest by visual stimulus, and to motivate students to learn Chinese vocabularies but also Chinese Idioms in either school settings or at home.

The integration of digital game and language learning is not difficult, however, Chinese language-learning programs are still memorization-orientation, and not much fun [6]. Thus, the goal of this game was designed to engage learners by

making learning fun since Chinese is one of the most difficult languages to learn in the world. This computer-assisted educational game was tested in a national-wide competition in Taiwan. It is important to reveal the complex interplay between game and learner, and to understanding the process that occurs within learners' heads. We would like to gain understanding to what extent participants apply their acquired knowledge and skills in this competition-like problem-solving situation. Therefore, this preliminary study aimed to investigate participants' anxiety sensitivity, cognitive load and participants' interest in playing the game. Moreover, the relationship path between anxiety and interest were examined.

II. RESEARCH HYPOTHESES

Out of the literature review, couple questions emerged that would expand the knowledge base regarding anxiety and interest in playing an online game. Therefore, hypotheses have been distilled in the following major research hypotheses:

- H1: Somatic anxiety is positively associated with students' interest in playing "Chinese Idioms String Up Puzzle."
- H2: Somatic anxiety is positively associated with students' cognitive load in playing "Chinese Idioms String Up Puzzle."
- H3: Psychological anxiety is positively associated with students' interest in playing "Chinese Idioms String Up Puzzle."
- H4: Psychological anxiety is positively associated with student cognitive load in playing "Chinese Idioms String Up Puzzle."

III. PARTICIPANTS AND SETTING

The Digital Game-Based Learning Lab and Hinet EduCities hold a competition to motivate students to learn Chinese Idioms by through the website-based game named "Chinese Idiom String Up Puzzle." To get qualification in the final match, students who were primary or junior high school students had to attend the kick-off regional competitions. Therefore, those students in the final match were invited to participate in this study.

The Hinet EduCities was asked to pass out the survey package to each participant involving in the final match of the "Chinese Idioms String Up Puzzle" Competition. After the competition, each participant was given a questionnaire. Of the 122 returned questionnaires, a total of 63 participants were males and 59 participants were females. According to survey responses the minimum age of the participants was 10 years old; the maximum age was 16 years old. The mean age was 13.09 years old. Their grades ranged from grade 4 to grade 9.

IV. METHOD

A. “Chinese Idioms String Up Puzzle” game

“Chinese Idioms String Up Puzzle game”, like crossword puzzle, is a text reconstruction online program developed by the Digital Game-Based Learning Laboratory, National Taiwan Normal University in Taiwan, and it was designed on the belief that this game is highly motivating, and engaging. This tool used the power of computer and competition or collaboration toward the fun factor to motivate Chinese idiom learning.

Figure 1 shows the illustration for practice. Students are timed to key in the missing words of the Chinese idiom in each side of the square clockwise. They are expected to type and learn Chinese idioms by searching their memory scheme and associating Chinese idioms for finding out the correct character. In addition, this game could pair students to challenge each other (Figure 2). This game encouraged students to use their organizing schemes to explore language, thus, students are active participants rather than passive recipients in learning.



Fig. 1. Key in the missing characters to make words in each side of square becoming a four-character idiom.



Fig. 2. Paired students to challenge each other.

B. Instrumentation

The survey was carried out to gather participants’ opinions regarding anxiety and interest in playing this game. To develop an appropriate self-report instrument, the questionnaire of this study was derived from literature review,

existing document, and other existing questionnaires by other researchers, such as Ree, MacLeod, French and Locke [7], Paas, and van Merriënboer [8], and Lusk [9].

The first section contained 22 items asking participants to rate the degree of anxiety on a 5-point Likert scale where 1=very low, 2=low, 3=normal, 4=high, and 5=very high. These 22 items were related to somatic anxiety, psychological anxiety, source of anxiety, whether anxiety is helpful on the test, and whether the degree of anxiety lowers after the test. The second section, section B, included 9 items on a 5-point scale, where the responses were strongly disagree=1, disagree=2, neutral=3, agree=4 and strongly agree=5. Section C asked participants to rate 13 statements regarding cognitive load in a 5-point scale where, ‘strongly disagree=1, disagree=2, neutral=3, agree=4 and strongly agree=5’.

V. RESULTS AND DISCUSSION

The structural model testing indicated that somatic anxiety was not significantly related to students’ interest in playing the game; somatic anxiety is positively associated with students’ cognitive load; psychological anxiety was not significantly related to students’ interest in playing the game, and psychological anxiety was positively associated with students’ cognitive load (Figure 3).

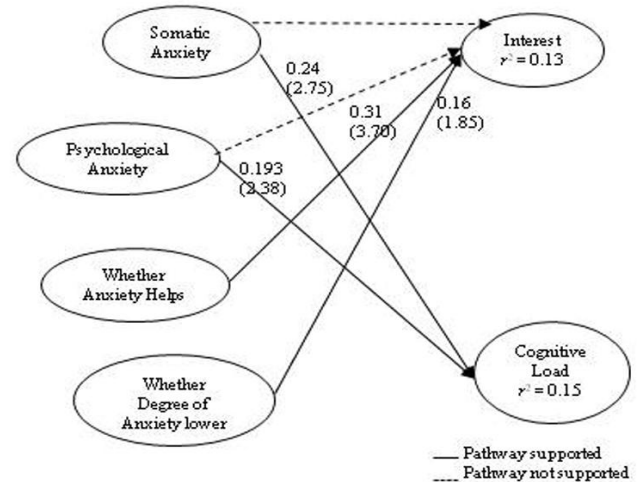


Fig. 3. Structural model testing.

Through structural model testing, it was apparent to find out that participants felt that anxiety was helpful on the test, and the degree of anxiety lowered after the test. In addition, the study results indicated that the higher degree of psychological and somatic anxiety, the greater cognitive load participants had.

It was interesting that participants’ anxiety seems do not play an influential role to their interest whereas anxiety influence cognitive load. We concerned that students might not be interested in the game, however, the results of the descriptive statistics also confirmed that participants’ attitude to learn Chinese Idiom by using “Chinese Idioms String Up Puzzle” game was positive. Participants seem to be interested to continue using the program to practice Chinese idioms in the future. Many of them believe the interface design was easy

and instruction was clear. Thus, it implied that this Chinese game is practical for teachers to employ in Chinese idiom teaching.

Educational games grow fast, we seek to contribute to this field by showing the positive learning outcome of “Chinese Idioms String Up Puzzle” that has attracted the attention of participants, and we hope to deploy this learning strategy in both educational settings and at home. Learning consisted of cognitive, psychomotor and affective domains [10], thus, it is needed for teachers to integrate different domains of learning into their lectures, and make efforts to improve students’ learning motivation.

This study is unique in that it is the first to explore whether factors, such as, anxiety, and cognitive load influence children’s intention to play an online game called “Chinese Idioms String Up Puzzle.” Thus, the online game itself is unique and may be useful to future researchers interested in a deeper understanding regarding Chinese Idioms learning issues.

It is needed to be cautious while interpreting the results because participants were voluntary and their computer skills were advanced to type in Chinese characters in a limited time. In addition, participants were using the program for a period of time.

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