Designing a Library-use Instruction Educational Board Game with Situated History Story to Enhance Information Literacy Learning

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Abstract

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Keywords: situated learning, game-based learning, educational board game, scaffolding, library-use instruction.

1 Introduction

Library plays important roles in education and learning. Information literacy(IL) is an essential part of library use instruction[1,2]. However, lack knowledge of how to use library resources effectively and easily overwhelmed by massive amounts of library information were big issues for learners[3]. The challenge of engaging students in information literacy instruction(e.g. Boolean algebra indexing) has been noted [4]. Therefore, teaching students to utilize libraries and enhancing their library literacy gain more attention[5]. The study designed a library-use instruction educational board game to facilitate students' engagement and information literacy learning. Game-based learning is a rising approach for promoting learning engagement, and the students are often excited and enjoy the game-based learning activities[6]. Unlike digital game, learners' face-to-face interaction in board games may promote their interactive collaboration and learning motivation. Moreover, some studies showed that board games could develop learners' divergent thinking and creativity than digital games [7] and other studies showed the positive effects of board games on learning performance [8]. Based on situated learning [9], the real history story as context with role-play and clue analysis mechanisms may promote learners' understanding of information literacy and immerse into the game.

The young man(player) have to help the main character back to Japan by overcoming different tasks with appropriate solutions through the books the player find in the library. There are five adventure stages each stage main character will be deducted health points. The game is over when health point is zero. First, players have to analyze the task (task card as Figure 3) to discuss the right keyword, and pick appropriate clues cards(Figure 3) from cards on the table, or used keywords from card deck with search point. Then, players use the Boolean algebra on search

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card(Figure 3) with clue cards to search the books they want (Figure 3), and the search point will be deducted according to the number of books they find in the library(book card deck). Finally, check with task card back if the books players find could solve the task. If they find the right book and gain health points, otherwise they will lose health with each wrong book. Therefore, analyzing the task, identifying right keywords, and using Boolean algebra to find the right book to avoiding "garbage in and garbage out" to lose the health and search points are the key mechanism in the game. Based on the dual-scaffolding game-based learning model [10], the task cards contains all the clues player need as cognitive scaffolding. Also, players need to share key words they have and discuss the key words they want to use to search the book as peer scaffolding.

2 Methodology

A one-group pretest-posttest design was adopted in this preliminary study. Participants were 20 third to six grades elementary school students in northern Taiwan. Each group has 4 learners and was given a set of board game. The research procedure were two hours: 5 minutes study introduction, 15 minutes pre-test, 20 minutes game teaching, 60 minutes game play and 20 minutes post-test and questionnaires. Ten questions were employed as the pre- and post-test of the learning performance including "keyword identification,"(e.g. setting the keyword for book introduction and task)and " Boolean algebra application"(e.g. Find the book with specific keywords and Boolean algebra from the library on the sheet).Both game and pre- and post-test are based on the same concept that analyzing the task, identifying right keywords, and using Boolean algebra to find the right book.

To evaluate the learners' flow, the research adopted Killi's flow scale [11], which was translated and revised by Hou and Li [12]. This questionnaire is composed of the two dimensions of flow antecedent(e.g. I was challenged, but I believed my skills would allow me to meet the challenge) and flow experience(e.g. My attention was focused entirely on playing the game) Furthermore, this research also referred to Davis's [13] technology acceptance model to evaluate the learner's perceived usefulness and perceived ease of use toward the game. All items were scored in five-point Likert scale. The Cronbach's alpha values of the flow and technology acceptance were 0.95 and 0.91, respectively.

3 Results

Table I summarized the results of a paired-samples t-test for the learning performance. The results showed there was a significant difference in the score for the pre-test and post-test (t=-5.63, $p<0.001$), and it suggested that this board game had positive effect toward information literacy learning and library use education.

Table 1: Summary the evaluation of leering performance (N=20)

	Mean	*S.D.*	*t-value*
Pre-test	52.65	15.44	-5.63[***]
Post-test	75.00	14.73	

Figure 1: The game components: the game board and the cards.

Figure 2: Learners discuss and analysis the information and clues.

Figure 3: The main cards of the game.

Table 2: The mean and standard deviation of flow and technology acceptance score and one-simple t test (N=20)

Dimension	*Mean*	*S.D.*	*t*
Flow antecedents	4.03	0.75	6.13[***]
Flow experience	4.04	0.75	6.22[***]
Flow	4.03	0.70	6.62[***]
Perceived usefulness	4.23	0.67	8.24[***]
Perceived ease of use	3.88	0.81	4.86[***]
Technology acceptance	4.08	0.67	7.15[***]
Game Element	4.15	0.75	6.77[***]

The result of flow and technology acceptance were as shown in Table II. The means of overall flow and game acceptance and each sub-dimensions were both significantly higher than the median (the median in a five-point scale=3).The findings indicated that learners engaged in this game. In other words, learners considered that this game can help them learn information literacy and is easy for them to play.

4   Discussion and Suggestions

The research developed a library-use instruction educational board game with situated history story to enhance information literacy learning. The results of this research indicated that learners have better understanding of information literacy in library use instruction. In addition, learners enjoy the situated board game and consider that this game-based learning activity truly supports their learning. For the further study, deep analysis of learners' anxiety, motivation and decision-making process behaviors need to be investigated. Also, how the scaffolding in the game facilitate students to learn better need to be explored.

5   Acknowledgment

6   References

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