Digital Game-Based Tools for EFL Learners in Asian Countries

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ABSTRACT

With the popularity of the Internet, digital game-based tools have been dramatically used in nowadays language learning process. Its great value of applying in EFL learners' study has also become significant. Most researchers discovered that game studies are more effective in learning and student achievements in terms of retention and can also improve their interaction between others as well as their engagement. However, attention on DBLT using in the Asian countries still received less than these in Non-Asian countries, so understanding the importance effects of using DGBT in EFL learners is very important. The present study analyzed the DGBL and EFL in three aspects, the effectiveness of DGBL on EFL, mediators between DGBL and EFL, and relevant factors to the effectiveness of DGBL. The effectiveness of DGBL on EFL can be discussed from students' developmental stages since students in different school levels would study different things, from easy to complex, of English. The mediators can be included by cognitive complexity, motivation or willingness, and stress or anxiety. We reviewed different studies relating to these factors to know the DGBL and their relationship. The last one we wanted to argue is the relevant factors that influence students' DGBL procedures like teachers' role, the in-game instruction, and prior knowledge. We found that using DGBT can improve EFL learners' performance in different ages, DGBT related to learning outcomes differently through different mediators, and the relevant factors can be contributed to EFL learners using DGBT to learn English. There are also some limitations in the review research papers, also in the current research field, future directions are discussed.

Keywords: Digital game-based tools, Digital game-based learning, EFL learners, Asian countries

1. INTRODUCTION

Digital game-based tools (DGBT) refer to the technical approaches designed to facilitate people's learning skills [1]. English as a foreign language (EFL) learners is defined as a group of people who have barely been in an environment that does not use their first language [2]. Today English has got the status of a global language, and it is therefore becoming the position number one language all over the world. It is the key source of global discourse, an adopted language in many areas of the world [3]. Studying the impact of digital game-based tools for EFL learners in Asian countries is very important, comparing to the amount of research on western countries' education, research on digital-game based learning in Asian counties' language education and learning is comparatively less, while nowadays English has played a significant role in the world [4]. Although some Asian countries (e.g., China) have set up some

policies to teach English, there is still a documented list of problems [5], including limited availability of English print materials necessary to develop literacy skills in English and a scarcity of qualified English language teachers in rural China [6]. Besides, people in some Asian countries would not use English until they attend English classes. It is essential to understand the influence of digital game-based tools on the EFL learners in Asian countries since research suggests that digital game-based learning is well suited for second language learning, particularly given its potential to lower anxiety and its ability to increase exposure to and use of the target language [7]. It is obvious that Asian EFL learners lack the proper opportunities to study English, and DGBL can improve the learning resources in English. This study aims to understand the effectiveness of DGBL to EFL in Asian countries and can give the same sample of interventions for people who want to do research on Asian countries.

Bakan showed some relevant theories on game-based learning. In the study, the constructivist theory supported the opinion that knowledge appeared because structuring in the people's mind interacts with the game-based direction in light of teaching procedures and techniques in this circumstance. According to the cognitive theory, more information acquired in the process was more lasting. In the behaviorist approach, the grades and rewards obtained in the game and the losses on account of the misses made in the game were treated as the prize-penalty system. The humanist approach is a theory of essence on self-realization. In the study, researchers use the game's skills and resources to create a learning environment that would fit learners. However, if people merely choose decisions that suit them, it would not be regarded as self-realization. In fact, no matter what choices people would make, it is still potential for them to fulfill self-realization [8]. Kiili presented an experiential gaming model on DGBL. The main goal of the model was to connect gameplay with experiential learning to facilitate a flow experience. The model was pictured that learning was a repeated procedure through direct experience during the game. It stressed that it was important to provide players with quick feedback, obvious goals, and challenges equal to players' levels. It showed that flow experience could not be ensured to players, but educational games that have the possibility of experiencing flow could be provided. The flow's reward had a positive effect on players' learning and attitudes. The experiential gaming model could be used to design and analyze educational games. Kiili suggested that designers of educational games should also stress the importance of the intriguing storyline and proper game balance in order to involve players [9].

Constructivist theory, cognitive theory, behaviorist approach, and humanist approach have been discussed above. As an increasing number of people use electronic devices, digital tools play important roles in daily life. Digital games are now regarded as possible to attract learners and improve interaction in the target language [10]. Additionally, with the development of globalization, English, as a foreign language, has generally become common and crucial in Asian countries. Thus, it is essential to further study the digital game-based tools for Asian EFL learners. However, only limited studies investigated the development of digital game-based tools for EFL learners in Asian countries. This review aims to evaluate the effectiveness of game-based tools, the different types of the tools, and the factors related to the effectiveness to have a better understanding of the digital game-based tools for EFL learners in Asian countries, which is hoped to provide inspiration and orientation for the further study and the development of effective digital tools.

2. THE EFFECTIVENESS OF DGBL ON EFL

The effectiveness of DGBL on EFL can be discussed by ranging the participants into different developmental stages. At the pre-school level, most EFL students would focus on learning vocabulary and phonics. Students at this age are still too young to learn complicated grammars. In the study by Bang et al., they examined the English language learning outcomes (e.g., linguistic development) of young Chinese L1 (defined as mother language) children (5-6 years) when using tests from a digital self-guided learning tool, and designed based on principles of second language research [7]. During the pretest and post-test study, the experiment group participants used the digital learning tool to engage in English language learning activities for 15–20 minutes daily for six months, while a control group used a comparable digital tool to do online math activities for an equivalent amount of time. It was found that experiment group children made statistically significant speaking improvements on each of the language skills assessed (e.g., vocabulary identification, speaking skills, pronunciation), and the parents' survey results also shown that their children made improvements in speaking, understanding, and reading English words or sentences. The scientists also reported that they believed DGBL helped their children become more interested, motivated, and confident in English. Besides, the consistent usage of a digital English learning tool could be highly effective in helping young Chinese learners in an EFL context to develop their English language skills.

In elementary school or secondary school, EFL learners can start to learn some basic grammar. Yang and Quadir investigated how students' different levels of prior knowledge, in terms of their prior English ability and online gaming experience, affect their learning performance and anxiety in an English learning the online role-playing game, a digital educational game to facilitate English learning [11]. They did this research in a sample of the students aged 12 on average in an elementary school in northern Taiwan, and the students were divided into the two groups according to their English ability performed in the previous semester and their online gaming experience (e.g., high and low judging from the mean). These students were tested using multiple-choice questions (MCQs), Foreign Language Classroom Anxiety Scale (FLCAS), and interviews. The results showed that the high English ability students significantly outperformed those with low English ability in the pre-test stage. However, the low online gaming experience students significantly outperformed those with high online gaming experience, DGBL can help them concentrated more on the task description, and they regarded the DGBT for encouraging their English learning as well as cited that their English ability seemed to have improved after playing the online game.

Furthermore, the results showed that prior English ability was positively correlated to learning performance but negatively correlated to anxiety, and anxiety was negatively correlated to learning performance. These findings suggest that a contextual game-based learning environment can be exploited as a useful tool to support language learning; on the contrary, the learning performance and anxiety created by the environment were affected to varying degrees by the levels of students' prior knowledge.

At the college level, EFL learners could start to focus on English interaction. In the study by Choptipaktanasook et al., the effects of a massively multiplayer online role-playing game on interaction in the foreign language were measured in a sample of Thai EFL learners at a university in Thailand. The DGBT could make EFL learners have chances to play with people whose mother tongue is English and provide communicative opportunities for EFL learners combined with the course as a lesson review provided after participants finished each unit. Subsequently, they needed to participate in face-to-face communication, including discussion and interview role-play. Then they carried out quantitative analysis (e.g., number of English words produced in the communication) and qualitative analysis (e.g., functional features of the communication) for examining the game's effects on interaction in EFL. The study apparently showed that interaction during gameplay could facilitate EFL learners to make significantly more EFL output, including a great many communicative functions than in-class activities. The findings suggest that DGBT played an important role in improving the quantity and quality of EFL interaction among Thai EFL learners. They found that participation in DGBT could allow learners to participate in EFL interaction [12].

3. MEDIATORS BETWEEN DGBL AND EFL

The intermediate factors between DGBL and EFL should also be considered, like what makes DGBL being affected by EFL and what makes up this effectiveness. In this situation, these mediators can be divided into three dimensions, shown in the following part. The first one is cognitive complexity. Cognitive complexity is defined as children increasing control over their behavior as they acquire increasingly complex rule systems and reflective awareness of those rules [13], which also means that the game is becoming more difficult to go through. For example, the Moving Word Task is a type of task designed for children to move words according to different criteria (e.g., shapes for the beginning and attributions in the end). When people are dealing with mathematical questions, they will start with the easy ones since as the operational symbols and rules become complex, the question would become much more

difficult. Learning English is the same way as math. There are a lot of grammars and tense in this language. If one sentence combines various tenses and grammars, it would be hard to understand its meaning. Yang et al. evaluated EFL students' English vocabulary learning performance, anxiety, and behaviors in different game elements (e.g., game level and game cognitive complexity) by using a set of tests and questionnaires in a sample of Chinese students (17 years) [14]. Students were in two different groups in their study, one using the complexity-based competition strategy while the other one was using the common competition strategy (other variables were the same). Before the experiment, students had a 3-week course and took the pretest and pre-questionnaire as their evaluating standards. They found that under an English learning game-based learning system, which is based on a cognitive complexity-based competition strategy, Chinese students can significantly increase their learning performance and better game-based learning behavioral patterns.

The second one is motivation or willingness. Motivation or willingness is typically defined as the forces that account for arousal, selection, direction, and behavior continuation. When students lack motivation, they will not focus on what they are doing. English is the language that Asian students seldom use in their daily life. Since they are not good at it, they are not willing to use English. If the motivation or willingness to use English has improved, it is beneficial for EFL learners. In the study of Lee and Drajati, the under-researched relationship between informal digital learning of English (IDLE) activities (e.g., receptive IDLE activities and productive IDLE activities), affective variables (e.g., grit, motivation, self-confidence, and second language speaking anxiety) and willingness to communicate in second language research was examined in a large group of Indonesian EFL students (18 to 36 years, average 21.19 years) using a set of questionnaires [15]. IDLE can be understood as self-directed English learning activities beyond the classroom in informal digital environments that are not structured nor driven by a formal teacher. The questionnaire including two types of IDLE activities: receptive IDLE activities (RIA, referred to pay attention to understand something in English) and productive IDLE activities (PIA, referred to producing communication in English), items for the L2 (referred to the language learn after the first language) willingness to communicate (WTC) scale, the concern for the affective variables and the demographic information. Each part was rated on a 5-point Likert scale (e.g., 1 not like me at all to 5 very much like me). Their results show that students' L2 willingness to communicate (WTC) correlated significantly with all of the IDLE activities and affective variables. Plus, only productive IDLE activities (PIA), grit, self-confidence, and motivation were found to significantly predict students' L2 WTC. In contrast, the other variables (e.g., RIA, L2 speaking anxiety, and

demographic variables) were found not to be determinants of students' L2 WTC.

The third one is stress or anxiety. Stress or anxiety is referred to a negative physical state of mind in human beings. For instance, if students are stressed or anxious, they would feel that it is hard for them to concentrate and be easily distracted. When people are studying, they need to fully pay their attention to their things to better understand the new knowledge. EFL learners should also need to reduce their stress and anxiety when studying English because some grammars in this language are difficult for non-native speakers. Reinders and Wattana assessed the feeling and experience of the digital game-based learning in Thai EFL students by interviewing them after a 15-week university language course, using DGBL for teaching [16]. This course would help the students develop all-around skills (e.g., reading, listening, speaking, writing, and grammar) and practical English communication skills practice). Besides, all the courses cover six units, and all were taught in face-to-face classrooms lessens. At the end of each unit, participants completed a review session by playing the digital game and completing a quest (e.g., a mission that players are assigned to accomplish within a game). Game playing took place during normal lesson time. After completing each of the six computer game sessions, a semi-structured and face-to-face interview was held with five randomly selected students (using a random number generator), allowing for detailed descriptions of the effects of game playing on WTC levels. In addition, the interviews also involved eliciting narratives from the students by asking them to talk about their communicative experiences in every interview and their perceptions of WTC in English while interacting in the game only in the final interview. They found that game playing had lower participants' anxiety (e.g., less anxious to make mistakes and ease fear for evaluation) no matter they enjoyed the game or not, and had increased their perceived communicative competence as well as the motivation to communicate in English. The game-playing tool could also make participants more willing to communicate in English (e.g., they felt more relaxed and confident to use this language).

These results indicate that, first of all, through the study of Yang et al., DGBL contains students' cognitive complexity to improve their English learning performance and learning behaviors. Besides, in the study by Lee and Drajati, DGBL can increase students' motivation and willingness when they are studying an English course and can help them gain more self-confidence. In addition, Reinders and Wattana's study showed that DGBL could reduce students' stress and anxiety and making them more enjoyable to communicate in English. To sum up, mediators: cognitive complexity, motivation or willingness, and anxiety or stress, play roles in the relationship between DGBL and EFL.

4. RELEVANT FACTORS TO THE EFFECTIVENESS OF DGBL

Teachers' role in DGBL is one of the relevant factors to the effectiveness of DGBL. Magliaro and Ezeife pointed out that teachers could and did play crucial roles in the classroom interventions [17]. Rivkin et al. suggested that classroom intervention would directly be attached to the expectations and value when integrating teachers who could influence what and how their students learn [18]. Kenny et al. indicated that successful classroom intervention was mostly based on teachers' belief that the experience deserved the effort. Whether the teachers would adopt the instructional strategies was directly linked to their opinions, ideas, and beliefs on what was potential, practicable, and helpful. We will later discuss how teachers could assist students in preparing for the DGBL class. Blume also showed in the study that respondents (preservice teachers studied at a German university) generally indicated positive beliefs of the use of DGBL. However, there was a negative correlation between digital media usage in their own teaching process and the beliefs because they lacked prior experience on DGBL [19]. Therefore, teachers require to learn and be trained on how to be integrated into DGBL. In the study of Kenny et al., the role teachers' expectations and the value of video games play in their adopting and integrating them in their classrooms were assessed by using pre- and post- questionnaires in a sample of undergraduate preservice teachers in their late teens and early twenties at a university in the United States. After finishing the pretest (e.g., the comfort level they had when playing and the willingness to play), two groups of participants were asked to play the same video game on different machines, then they were needed to answer the questions of a posttest (e.g., whether they felt the video game could teach things). Comparing the pretest to the posttest, they found that those preservice teachers who had a negative attitude towards game playing at the beginning had significantly changed into a positive belief after playing the game. Kenny et al. also pointed out that in order to change future teachers' opinions on playing video games, teacher-training courses needed to provide more comprehensive activities that could facilitate future teachers to be familiar with video games [19]. As teachers' role is an important factor in DGBL, enhancing teachers' DGBL training is likely to improve the effectiveness of DGBL.

The use of in-game instructions is the second relevant factor to the effectiveness of DGBL. As students often need teachers' directions before practice to know what to do, instructions in chalk-and-talk lessons are relatively essential. However, many players and game designers only focus on games' content but do not have much concern about in-game instructions. Therefore, we will discuss the influence of the in-game instructions on EFL according to a prior study. In the study of Tan et al., the

extent of the usefulness of the in-game instructions in enhancing the vocabulary acquisition of EFL learners was assessed by using observation checklists (e.g., emotions and actions of participants), face-to-face interviews (e.g., participants' attitudes to the effectiveness to the in-game instructions in competing tasks in games) and pre- and post-game vocabulary tests (e.g., matching type tests based on the in-game instructions) in a sample of students (11 to 12 years) from a suburban school in Pahang, Malaysia. A detective-themed hidden object game was used in the study to test the effect of in-game instructions on participants' vocabulary acquisition because the game could be easily manipulated by simple clicking. They found that only some in-game instructions (e.g., "displaying pictures of objects mentioned" or "having the objects moved") were able to arouse the curiosity of the players. The findings also showed that those instructions in-game could not help these players be familiar with unknown words [20]. These results indicate that the use of in-game instructions is important for DGBL. As the use of in-game instructions is a crucial factor to the effectiveness of DGBL, paying more attention to the content and function of instructions in DGBL is possible to boost the effectiveness of DGBL. For example, instructions in games could better be designed to help players score or win the games in order to discourage them from ignoring instructions that could facilitate their vocabulary acquisition.

Prior knowledge is the third relevant factor to the effectiveness of DGBL. Prior knowledge would be needed, and for example, when students read difficult articles, they might need teachers to tell them some new vocabulary and grammar to avoid being overwhelmed by challenging tasks. Thus, would prior knowledge be needed in DGBL for effectively learning? In the study of Yang et al., effects of prior knowledge on learning performance and anxiety in an English learning online role-playing game were assessed in a sample of students (12 years on average) in an elementary school in northern Taiwan. The game they used in the study was an online role-playing game designed for EFL. Participants first took the pretest (e.g., an English test to evaluate students' EFL performance), then they were given brief instructions to ensure they understood the game operation. Subsequently, they played the game and took the posttest (same test with the pretest) and the Foreign Language Classroom Anxiety Scale (FLCAS) (e.g., students' anxiety in EFL with DGBT). The findings revealed that prior knowledge would play an influential role in DGBL and implicated that course instructors should receive sufficient training of DGBL, and system developers who design the DGBL system should attach great importance to the learners' prior knowledge [11]. Inconsistent with these results, teachers' role and in-game instructions are relative factors to the effectiveness in DGBL, but prior knowledge is also helpful to DGBL.

Therefore, it would probably be important for teachers and game designers to put a high premium on prior knowledge in DGBL to help learners master EFL.

5. LIMITATION AND FUTURE DIRECTION

Some limitations should be addressed, though. First, previous studies on digital game-based tools for EFL learners in Asian countries are insufficient. Second, many researchers merely investigated the performances of participants at a single developmental stage. Third, as those factors to the effectiveness of DGBL were only analyzed separately in previous studies, those factors' interactions are still unknown.

As for the future direction, first, further studies on digital game-based tools for EFL learners in Asian countries are still needed. Second, researchers could launch some longitudinal studies. For example, they could trace those participants to examine whether those factors to the effectiveness of DGBL could facilitate their EFL in a long period. Third, systematic researches are required to see if the interaction of those useful factors could have a better effect on EFL.

6. CONCLUSION

In this paper, we analyze three aspects of DGBT for EFL learners in Asian countries, the effectiveness of DGBL on EFL, the mediators between DGBL and EFL, and the relevant factors to the effectiveness of DGBL. For the effectiveness of DGBL and EFL, we analyze the previous research according to the participants' age since, in different ages (e.g., pre-school, elementary school, and high school), the goals of EFL learners would be different. For the mediators between DGBL and EFL, we consider three factors (e.g., cognitive complexity, motivation, and stress) that would make DGBL positively or negatively influence EFL learners. For relevant factors to the effectiveness of DGBL, we found that teachers' role (teachers need to be trained), in-game instructions, and prior knowledge have played an important role for EFL learners who use DGBL. There are also some limitations: the previous study about Asian countries is less, and the participants are not in different developmental stages, researchers did not follow up the studies, and they did not consider the interaction of different factors. We think that more studies like longitudinal studies and systematic researches in the areas need to be done.

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