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Game-Based Language Learning in Technological Contexts: An Integrated Systematic Review and Bibliometric Analysis

Gwo-Jen Hwang, National Taiwan University of Science and Technology, Taiwan
Pei-Ying Chen, National Taiwan University of Science and Technology, Taiwan*
Shih-Ting Chu, National Taiwan University of Science and Technology, Taiwan
Wen-Hua Chuang, National Taiwan University of Science and Technology, Taiwan
Chin-Ya Juan, National Taiwan University of Science and Technology, Taiwan
Hui-Yun Chen, National Taiwan University of Science and Technology, Taiwan

ABSTRACT

In the COVID-19 pandemic, delivering learning content to students via the use of technologies has become mainstream. Among various technology-supported learning modes, game-based language learning (GBLL) has been considered an effective approach to engaging learners in joyful and interactive contexts. This study aims to provide an overview of GBLL using bibliometric mapping analysis and coding analysis. This systematic review provides a scoping overview of empirical evidence on the use and impacts of games in language learning from 1989 to 2020. Based on a set of criteria retrieved from the Web of Science, 101 articles were analyzed. The coding analysis were three aspects to identify the research issues, performance issues, and interaction issues. Moreover, in a comprehensive review of the research on GBLL, insights are provided for educators and future research. The findings differing from those of previous reviews can serve as a reference for researchers on GBLL-related studies.

KEYWORDS

Bibliometric Mapping Analysis, Game-Based Learning, Language Education, Literature Review, Technology-Supported Learning

INTRODUCTION

With global internationalization, the number of people learning foreign languages is increasing (Alfadil, 2020), but it is challenging to implement digital game-based language learning, especially since the global COVID-19 outbreak. Learning a foreign language can help students acquire communication skills and enhance their competitiveness (Chen, 2018). Besides, language learning can also increase students' critical thinking (Wight, 2015). Studies have pointed out that game-based

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learning can effectively improve learners' language effectiveness, such as improving their vocabulary skills through game-based e-books (Smith et al., 2013), improving students' grammar skills through role-playing digital games (Rojas & Villafuerte, 2018), and using serious games to effectively improve their language writing skills (Niemelä et al., 2020). However, scholars have indicated that language learning, and in particular, learning a second or foreign language, is generally challenging for students (Cheng & Chen, 2019). Wu et al. (2014) further indicated that lacking learning contexts and motivation are two factors affecting learners' language learning outcomes. Therefore, it is important to situate language students in joyful learning contexts (Chen & Hsu, 2020).

Game-Based Learning (GBL) refers to learning through games in a digital or non-digital learning environment to enhance students' skills and knowledge (Wang & Zheng, 2020). In the past 2 decades, the use of game-based learning in different disciplines has increased, such as in chemistry (Wood & Donnelly-Hermosillo, 2019), programming languages (Topalli & Cagiltay, 2018), natural science (Herodotou, 2018), and language learning (Alfadil, 2020). Moreover, educational games have rapidly been developed for application in various learning environments, such as augmented reality (Hsu, 2017), virtual reality (Alfadil, 2020), digital games (Sung et al., 2017), and table games (Tsai et al., 2019) in recent years.

Previous studies have pointed out that game-based learning can improve students' learning effectiveness and motivation (Liu & Chu, 2010; Park et al., 2019; Ronimus et al., 2014). Park et al. (2019) designed an English vocabulary learning and arrow-shooting game. The results indicated that the proposed reward structure produced a statistically significant increase in the level of learning, motivation, and engagement. In addition, past research has included a meta-analysis of the cognitive and motivational effects of games. The results showed that the benefits of combining games with language learning are much greater than in other subjects (Wouters et al.,2013). Therefore, it can be known from the above studies that the use of games for language learning could more effectively improve students' learning effectiveness.

From the above studies, it can be seen that game-based language learning (GBLL) is gaining the attention of researchers. There are many reviews of past literature on game-based learning, as shown in Table 1. For example, Hwang and Wu (2012) analyzed the research trend of digital game-based learning (DGBL) from 2001 to 2010 and found that the number of DGBL articles increased significantly in the past decade. Tsai and Tsai (2018) reviewed the impact of digital games on the effectiveness of second language vocabulary learning and showed that digital games could effectively enhance students' vocabulary learning. Xu et al. (2019) analyzed 59 studies on digital games in English

Table 1.
Previous literature reviews listed by field of study

Author	Research Field	Sample	Time	Literature Review Focus
Boyle et al. (2016)	DGBL	143	2009-2014	This study updated Connolly et al.'s (2012) study and found that between 2009 and 2014, scholars became increasingly interested in the positive effects of digital games.
Hwang & Wu (2012)	DGBL	137	2001-2010	This study reviews the current and future trends of DGBL research from 2001 to 2010, and analyzes the research samples, subjects taught, and countries with the highest number of publications.
Hung et al. (2018)	DGBLL	50	2007-2016	This study reviews the current and future trends of DGBLL research from 2007-2016 and analyzes the research methods, digital games, target languages/learners and students' DGBLL outcomes.
Tsai and Tsai (2018)	DGBLL	26	2001-2017	This study reviewed the effect of digital games on second language vocabulary learning and analyzed eight dimensions, namely game design, educational level, L2 proficiency level, linguistic distance, intervention setting, assessment type, game source, and intervention length.
Xu et al. (2020)	DGBLL	59	2000-2018	This study reviewed the literature on digital games for English language learning and analyzed its participant characteristics, research methods, game features, and the correlation between game usability and game features.

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