

Trends of E-Book-Based English Language Learning: A Review of Journal Publications from 2010 to 2019

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Abstract: In recent years, e-books have been spotted in language learning research. A literature review is adopted to detect some gaps in specific areas in this study. Specifically, this paper reviewed the language learning with e-books studies published from 2010 to 2019 in selected journals from the Web of Science to explore the features and trends. A total of 43 selected studies were manually and systematically analyzed, revealing the following outcomes. The results indicated that 1) the most common participants are from preschools and elementary schools, but rarely from the secondary education level. 2) Preparatory e-books are the most commonly used. 3) Guided learning is most often adopted with e-books. 4) Reading is the primary target skill. 5) Nearly a half of the research results were positive, and nearly half were mixed. In order to support pedagogical practice with e-books, analyzing the effectiveness of functions or systems embedded in e-books would be necessary. More findings are provided to examine the usability and functionality of systems or functions in e-books and to assist teacher instructional guidance.

Keywords: Literature reviews, e-book, language learning, learning behavior

1. Introduction

The effectiveness of using technology in a learning environment has long received attention. In particular, owing to the advancement and popularity of mobile and wireless communication technologies, learners can access digital resources across real-world contexts without being limited by location or time (Andujar & Hussein, 2019; Daungcharone et al., 2019; Elaish et al., 2019). This implies the possibility of linking formal and informal learning as well as opportunities for fostering students to become active learners (Wang et al., 2020). In this case, the conventional teaching methods in the classroom are no longer applicable; instead, ubiquitous learning has attracted great attention, and e-books are used in the learning environment (Al-Harathi et al., 2020; Jia & Chen, 2020; Zhang et al., 2020).

Previous research has been conducted to discover trends in language learning using technology (Hwang & Fu, 2019; Hung et al., 2018; Zhang et al., 2020). Several key issues have been raised, such as research methods, research questions, languages, learner types, and learning outcomes. Hwang and Fu (2019) investigated trends in the research design and application of mobile language learning, and analyzed those issues. Hung and his colleagues (2018) conducted a review study and examined those critical aspects to analyze the trends in digital game-based language learning. Zhang and her colleagues (2020) did a systematic review of e-book-based language learning. It was found that the application of technology promotes language learning. These studies primarily focused on fostering learning; however, the issues of the analysis tool, dashboard, or learning logs embedded within the e-books were neglected. This study reviewed the e-book-based English language learning studies published from 2010 to 2019 in selected journals to pursue the trends of English language learning with technology specifically. Figure 1 depicts the relation of this review to the learning contexts of e-book-based English language learning, targeting learning skills and learning effects.

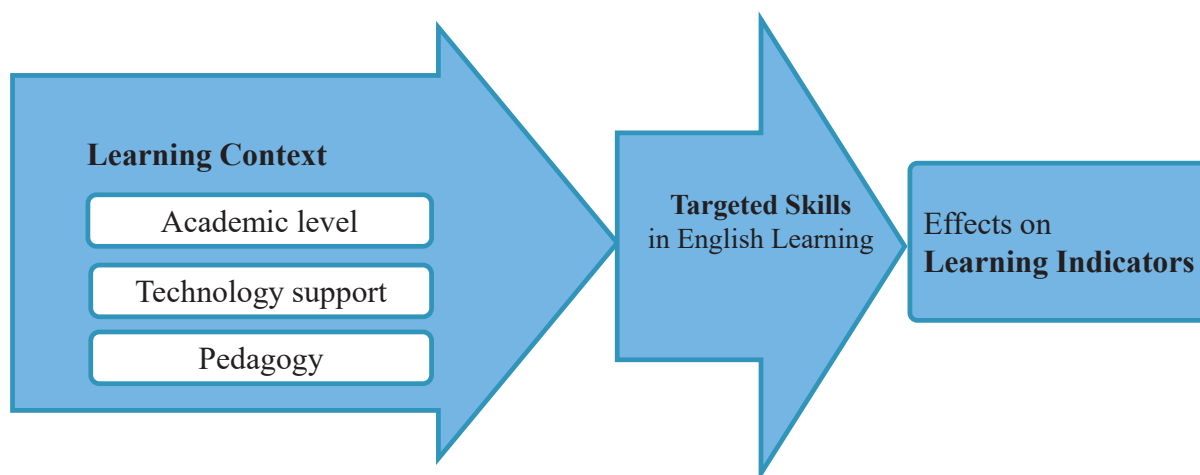


Figure 1. The e-book-based English language-learning context and its relation to targeted skills and effects on learning.

In light of the main goals, the current review study explores the following three research questions in the context of e-book-based English language learning from 2010 to 2019:

1. What were the learning context (academic level, technology support, and pedagogy) of the e-book-based English language learning studies?
2. What were the targeted skills of the e-book-based English language learning studies?
3. What were the effects on learning indicators of the e-book-based English language learning studies?

2. Method

2.1 Search terms and articles

First of all, keywords were identified based on the keywords from the previous review studies to search for potential articles or reviews. The searching keywords for e-books are based on Gupta and Dhawan (2019): “ebook” or “e-book” or “electronic book” or “online book” or “digital book.” The keywords for English language learning are: “language learning” or “literacy learning” or “second language learning” or “foreign language learning” or “L2” or “reading” or “listening” or “speaking” or “vocabulary” or “writing” or “grammar” or “pronunciation” (Hwang & Fu, 2019; Fang et al., 2019). In addition, “learning behavior” or “log” were added for further understanding of how previous studies collected and analyzed data.

The timespan for the most recent 10 years from 2010 to 2019 for this study was based on Hwang and Tsai's (2011) review study and their inclusion and exclusion criteria in order to effectively investigate the trends of educational technology. Document type was decided on categories of “article” or “review.” Moreover, articles or reviews were selected from the Social Science Citation Index (SSCI) in the Web of Science (WOS) since those are considered as reliable and highly qualified, and provide stringent criteria similar to the relevant reviews for this study. There were 95 publications from 67 journals that met the criteria. It was found that research on e-books has been continuously implemented over the decade, with increases in the number of studies standing out in 2012, 2017, and 2019. For the year of 2012, six publications out of 17 were regarding e-book usage relevant to eye movement or related to physical features, while five were about library issues. In terms of the year 2017, seven out of 15 studies focused on e-book accessibility or behavior among young children, while five put the focus on media, marketing, or consumer issues. As for the year 2019, there were more issues about reading behavior or engagement ($n=6$) and literacy ($n=3$).

The studies on observing general perceptions, such as attitude toward e-books, consumer perceptions, and other matters, were excluded since the focus was on e-book-based English language learning. Furthermore, two experienced linguists carefully examined all journal articles and their abstracts. Finally, there were 43 selected for this study. The number of e-book-based English language learning studies from 2010 to 2019 is shown in Figure 2.

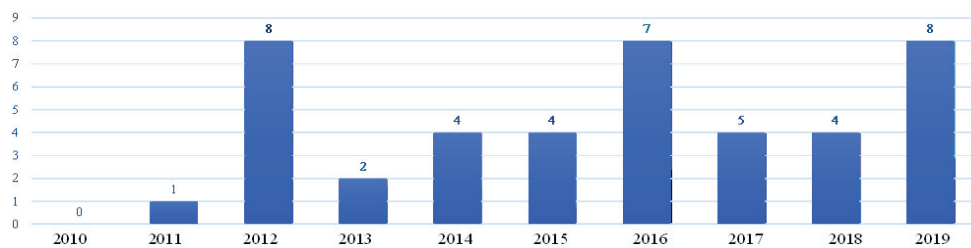


Figure 2. The number of e-book-based English language learning studies from 2010 to 2019.

It can be seen that the number of publications significantly increased from the first 5 years (i.e., 15 publications) to the second 5 years (i.e., 28). This implies that e-books have been widely adopted for language learning owing to the popularity of mobile and wireless communication technologies, as indicated by several researchers (Andujar & Hussein, 2019; Daungcharone et al., 2019; Elaish et al., 2019).

2.2 Coding Scheme

Two researchers and a senior English teacher worked on the coding process to understand the trends of e-book-based English language learning settings for the last 10 years. They determined the coding scheme for this study to resolve the concern of coding reliability. The inter-rater reliability of researchers' coding was 72%. That included learning context, targeted skills, and learning indicators. The coding scheme was modified to executing reviews as designed by Arslan (2020), Fang et al. (2019), Hung et al. (2018), and Hwang and Fu (2019). The main theoretical basis of the coding scheme was tailored from Hwang and Fu (2019). A coding scheme for e-book-based English language learning consisted of three coding items: academic level, technology, and pedagogy. Each category with its sub-categories is outlined in Table 1.

Table 1. *A Coding Scheme for E-book-based English Language Learning*

Contents items			
1. Learning context	1.1 Academic level	preschool elementary secondary higher	teacher mixed unspecified
	1.2 Technology support	preparatory researcher-developed unspecified	
	1.3 Pedagogy	guided learning inquiry learning collaborative concept/mind map peer evaluation peer tutoring	project-based learning game-based learning self-directed learning mixed unspecified
2. Targeted skills	listening speaking reading writing	vocabulary grammar pronunciation integrated skills	
3. Learning indicators	positive negative	mixed N/A	

2.2.1 Learning context: Academic level, Technology support, and Pedagogy

The academic levels include preschool, elementary, secondary/junior and senior high school, higher education, teachers' education, mixed, and unspecified. Two or more learners' academic levels mentioned in the studies were coded as mixed. The technology support is also in the learning context category. It includes preparatory e-books, researcher-developed e-books, and unspecified. The third category is pedagogy, which was divided into guided learning, inquiry learning, collaborative, concept/mind map, peer evaluation, peer tutoring, project-based learning, game-based learning, self-directed learning, mixed, and unspecified.

2.2.2 Targeted skills

This category was classified into eight coding items, namely listening, speaking, reading, writing, vocabulary, grammar, pronunciation, and integrated skills.

2.2.3 Learning indicators

This category was coded by using four coding items: positive, negative, mixed, and not available. The term "positive" indicated preferences and pleasant consequences of e-book learning, and rewarding and desirable outcomes such as resulting in effective learning and analysis. Negative indicated adverse outcomes such as non-preference and outcomes which did not result in effective learning. The term "mixed" indicated that there were both positive and negative results. The term "not available" referred to neither positive nor negative.

3. Results

3.1.1 Academic levels

Regarding the learners' academic levels, over 20% of the research was conducted observing elementary education (n=9) followed by preschool (n=8). E-book learning for higher education also attracted researchers' attention (n=6). A few studies were conducted for secondary education (n=2) and teachers (n=1). "Mixed" (n=7) included studies with preschoolers and parents' combination (n=5), elementary students and teacher combination (n=1), and both elementary and secondary education (n=1). Students (n=8), children (n=1) and participants (n=1) whose ages or educational levels were not identified were coded as "unspecified" (n=10). By combining the results of preschool education and those of preschoolers and adults' combination from "mixed," 13 studies were on early childhood language learning with e-books.

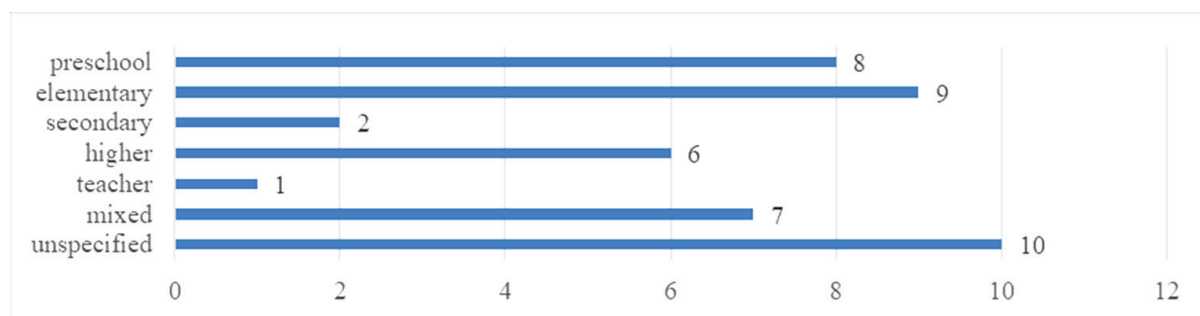


Figure 3. Academic levels of e-book-based English language learning studies from 2010 to 2019.

The result shows that language learning with e-books is popular for early childhood education, while it is not so popular at the secondary school level. In addition, how e-books were used was

observed: used for independent reading, shared-reading, or adult-led reading. There were 11 cases out of 13 which found that they were used for shared reading (nearly 85%). Some studies examined multiple cases, such as both shared-reading and independent reading. Therefore, the number did not match the total number of 13; rather, it exceeded 13. Three independent reading and three adult-led reading cases were found. The results indicate that e-books were used for learning and playing with, and were used as communication tools for young children. Parents and teachers promoted the development of the reading process during shared reading.

As the academic level increases, e-books were used more as textbooks. Some researchers developed or used e-books with functions such as computer games, concept mapping systems, and reading guidance and annotation maps to support learning (Smith et al., 2013; Li, 2015; Li et al., 2014). There was a study that observed teachers' pre-operational behavior toward e-book learning. Adequate instructional assistance for teachers would be necessary to support them in effectively using e-books as learning tools. As for adults, there was no attention paid to their language learning with e-books in the selected studies.

3.1.2 Technology support

E-books were examined in terms of the availability of technology support their use. The primary purpose was to find whether the e-book systems used for the studies were preparatory, researcher-developed e-books, or unspecified (Figure 4). There were 32 preparatory and seven researcher-developed e-books. Four studies did not mention the types of e-books, so they were coded as "unspecified."

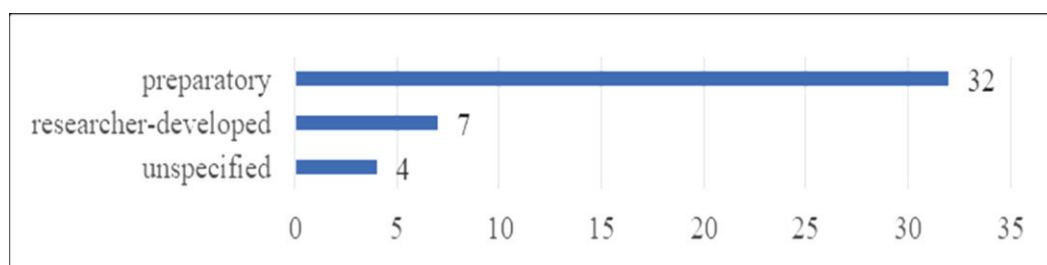


Figure 4. Technology support of e-book-based English language learning studies from 2010 to 2019.

Some functions or systems which helped to promote learning were observed among the preparatory e-book systems. According to Lin and Lin (2012), research participants found mark-up tools such as highlighting helpful, and pictures/animations and music/sound effects increased their motivation. E-book-based language learning in an informal learning environment was observed by Hwang et al. (2015) by using annotation-sharing functions. They suggested that e-book-based learning helped to reinforce learning by seamlessly connecting formal and informal learning. There were several studies conducted with analysis tools, either embedded or used separately. Some of them came with reading behavior or concentration monitoring systems and eye-tracking or reading rating systems. Hsu et al. (2012) developed a reading concentration monitoring system for use with e-books to examine students' reading concentration rates. The functions provided researchers with the opportunity to evaluate the data during the reading process in real time. Boticki et al. (2019) used a log as a part of the learning analytics to examine user models. By using functions or systems in e-books, researchers could collect detailed data and apply the evidence to promote learning performance.

The objective of the system was also examined for the e-books developed by researchers. Two e-books were developed for enhancing learners' motivation and engagement while improving language proficiency. For example, one study innovated a role-play picture e-book to boost learners' motivation and reading engagement by using the effect of emotive selfies (Kao et al., 2019). Two e-books were designed to analyze the reading process or behaviors (Lin et al., 2019; Li et al., 2014). In terms of the analysis tools, there were two e-books with the dashboard to monitor and analyze learning performance, and one used a log as a part of the learning analytics (Wu, 2016). Examining the usability, functionality, and effectiveness of the systems in e-books, as well as understanding learning processes to optimize learners' learning by using e-books should be taken into account more often in the future.

3.1.3 Pedagogy

Regarding pedagogy, guided learning was adopted the most with the use of e-books (n=14). Two types of guided learning were observed; one was human-guided learning (n=8), and the other was e-book guided learning (n=6). Five studies adopting self-interaction or individual readings were coded as self-directed learning. Three studies adopted project-based learning, one adopted concept mapping, and one adopted game based-learning as the learning strategies. Eight studies in which multiple learning strategies were adopted were coded as “mixed”: six guided-learning and self-directed learning integration, and two guided learning and collaborative learning integration. The 11 studies which did not mention any learning methods were coded as “unspecified” (Figure 5).

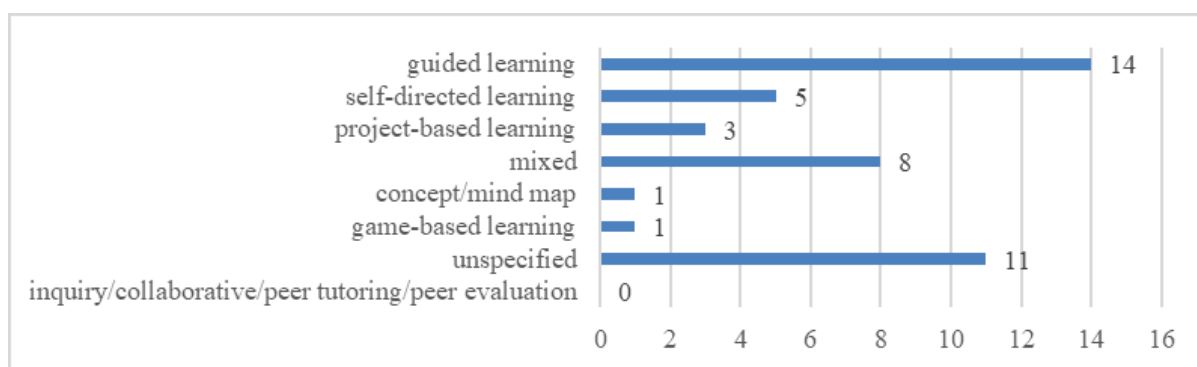


Figure 5. Pedagogy of e-book-based English language learning studies from 2010 to 2019.

It was found that e-books were used in the same way as conventional reading materials for language learning, and using e-books for shared reading guided and supported by teachers or parents has been popular, especially for early literacy.

Collaborative learning itself and peer evaluation or tutoring were not observed in this study. Those learning strategies would be more likely to be adopted when using a system that utilizes logs from which learners' information can be extracted to form groups or peers who share similar interests or academic levels. Elaborately designed teaching activities or learning strategies using e-books with such tools or functions would open up diverse learning opportunities in the near future.

3.2 Targeted skills

Regarding target language skills, over 76% of the studies (n=33) were conducted on reading skills. There was a single study on vocabulary learning (n=1), while nine studies were conducted to examine integrated skills; those were the integration of listening and vocabulary, reading and vocabulary, speaking, reading, and vocabulary, listening and reading, and writing and oral skills. Preschoolers' alphabet and letter recognition were categorized as reading, and phonological awareness was categorized as listening. Recall and cognitive outcomes were categorized as reading, spelling as writing, talk and vocalization as speaking, and letter-related behaviors such as saying names of letters or objects were coded as vocabulary.

Regarding the reading skills, 29 out of 33 studies examined reading behavior/attitude, engagement, or preference; data for those elements were collected mostly by implementing observation (including video recording), questionnaires, or quizzes. Thirteen studies analyzed reading performance, such as reading comprehension, fluency, recognition, or reading rates, and the data for those elements were collected mostly by using tools or functions embedded in the e-books. Some studies used both (or several) data collecting methods.

For integrated skills, e-book reading enabled users to learn not only reading but also other language skills like listening, speaking, writing, and vocabulary synchronically. One study (Smith et al., 2013) was on vocabulary skills. The vocabulary was integrated with other elements such as listening and reading in the study. Moreover, there were no studies targeting grammar skills found in this review.

3.3 Learning indicators

In terms of learning indicators of the studies' results, nearly half of the research was found to be positive ($n=20$, 46%), and the other half was mixed ($n=20$, 46%), which included both positive and negative results. Only two research results were found to be negative ($n=2$), both of which were conducted to compare the differences between e-books and p-books as learning tools. Their results indicated that students preferred p-books to learn rather than e-books. Students reported that they could attain better focus and retention of information in printed formats (Mizrachi et al., 2018), even though they were satisfied with e-books. P-books also appeared to enable better reading comprehension (Jeong, 2012).

Positive results showed that e-books were not just electronic reading tools; rather, they were well designed and elaborated textbooks with advanced technologies that enabled learners to increase their interest in reading, and improve their language skills. Not only integrating elaborated functions or systems into e-books and implementing those, but also providing instructional guidance for teachers to support their pedagogical skills with e-books will be essential to make e-book learning optimal. Overall, learners are satisfied with the use of e-books. Motivation and interaction are the most critical factors that support e-book language learning.

4. Conclusions and discussion

Major findings for the recent 10-year review studies on e-book-based English language learning in the selected journals from SSCI are summarized as follows. The learning context of e-book-based English language learning studies indicated that studies on e-books for preschool or early childhood education appeared to gain attention. There were few studies conducted at the secondary school level. As for the technology support of the e-books, preparatory e-books were the most common learning tools in the studies, while some researcher-developed e-books were implemented. Guided learning was adopted the most when using e-books. The majority of the recent studies were implemented on examining reading skills, while some others analyzed integrated skills. The targeted skills of e-book-based English language learning studies from 2010 to 2019 found that reading comprehension was examined throughout the decade; while early studies observed reading rate, more of the recent studies observed measuring the early literacy process. The effects on the learning indicators of e-book-based English language learning studies revealed that nearly half of the studies concluded with positive and nearly half with mixed results.

Several limitations of the study need to be acknowledged. First, research methods should have been more closely observed since research design is one of the crucial issues for the studies. Furthermore, the trends of e-books for language learning on the use of technology were not sufficiently discussed. Further attention to specifically designing and developing e-books to collect and analyze data would help to visualize the effectiveness of using e-books for learning and overall reformation of the educational system. By using functions or systems in e-books, researchers can collect detailed data and prove the effectiveness of using e-books for learning as evidence. Moreover, the use of e-books would require more guidance and teaching guidance to support teaching practice.

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