Reading Comprehension and Behavior in Children Using E-books vs. Printed Books

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Abstract

The purpose of this research is to investigate the influence that personalized, gamified, and PDF electronic reading practices have on the attitudes which fifth-grade students possess toward e-reading experiences, as well as how these stances affect the students' motivation and reading comprehension while they are learning English as a second/foreign language (EFL). For the purpose of the study, there were a total of 84 fifth-grade kids from public schools in Greece, who participated. These students were split up into three different experimental groups and a control one. Participants in the experimental groups read throughout the treatment period according to a preset schedule using one of three diverse electronic reading formats (PDF, gamified, or customized), whilst participants in the control group read utilizing a paper guided reading plan. The participants' experiences playing video games online were analyzed via a technique called the quasi-experimental approach. According to the findings of the research, the experimental group and the control group did not significantly vary from one another in terms of their levels of reading comprehension. On the other hand, in comparison to the participants in the control group, those who took part in the experiments reported having more favorable sentiments regarding their electronic reading experiences and were more inspired to read. As indicated from the research findings, kids may experience an increase in their desire to read when they use electronic gadgets. This study has implications for educators and policymakers as they consider incorporating digital reading practices into their teaching methods, particularly when it comes to improving students' motivation to read.

Keywords: EFL students engage in screen reading, gamification, digitalized storybook reading, and conventional interpretation

1. Introduction

In recent years, the relationship between technology and education has become increasingly evident. Educational technology has been shown to expedite human learning in a variety of contexts, including business, charity, healthcare, and education (Lafontaine et al., 2019). One area where technology has shown particular promise is in the realm of reading, with studies evidencing that reading skills can develop rapidly when new technology is commenced into educational settings (Szymkowiak et al., 2021). However, language instructors have reported that many students are hesitant to read in their target language, presenting a challenge for educators, especially those working with adolescents. Early attitudes and confidence when reading have been shown to significantly impact future reading success, emphasizing the importance of cultivating a love of reading in young children (Dreger et al., 2019).

Personalized, electronic reading lessons have been shown to improve English language learners' reading comprehension by providing modified versions of texts, while reducing cognitive load (Mohamed, 2018). Despite this, little research has been done on how young readers' understanding changes once they read literature on electronic devices, compared to in print. To address this gap in knowledge, a study is being conducted to improve the reading performance of fifth-year students in a Greek EFL environment by implementing customized and gamified electronic book reading (Troyer et al., 2019). The study aims to determine whether encouraging students to read electronic books individually and in the context of games during EFL lessons will increase their motivation and reading ability (Liu & Brantmeier, 2019). Due to the growing use of digital technology in schools, more and more young children are reading on their own electronic devices (Reimer et al., 2021). It is vital to comprehend how the understanding of young readers' changes when they read literature on computers as compared to in print — relatively few research has probed into the effect of reading media on children's

apprehension (Halamish & Elbaz, 2020). The incrementing usage of digital testing on international examinations (i.e., PIRLS2 and PISA3) is a major factor motivating this endeavor (Hwang et al., 2021). This project, which aims to improve the reading performance of fifth-year students in a Greek EFL environment via the implementation of customized and gamified electronic book reading, will expand the current body of knowledge on the topic.

The major purpose of this study is to determine whether pushing students to read electronic books independently and inside game-based activities during English as a Foreign Language (EFL) sessions may boost their reading abilities and drive. This piece of work also attempts to analyze the efficiency of customized, game-oriented electronic book reading strategies in typical classroom settings. Moreover, the authors hope to provide a manual for educators, parents, and librarians who seek to launch tailored and gamified e-book reading programs in their own institutions.

The influence of personalized electronic books on reading

Children are the target audience for personalized e-books, which are created with the intention of stoking their passion for reading and the art of storytelling. Reading programs that are custom-built to each individual student are gaining popularity among parents and teachers as a tool to improve children's academic performance and overall growth. These electronic books come with a variety of interactive capabilities, such as the ability to record one's voice, get feedback and guidance, highlight text, make use of hotspots, have the material read aloud, and even write their own tales. Personalizing a narrative for a youngster may be accomplished by giving that child's real-life friends and family members small roles in the story as supporting characters. Students have the option of creating an avatar to represent the story's main character and interpreting the story in their own unique way. The abovementioned activity allows students to make use of the technological aspects of reading in order to construct narratives that are both interesting and thought-provoking. Nevertheless, a study conducted by O'Toole and Kannass (2018) suggests that interactive elements in personalized e-books, such as hotspots and games, may make it more difficult for youngsters to comprehend what they are reading. As a consequence of this, the authors advise parents not to depend only on individualized electronic books for their children.

Impact of Gamification of Electronic Reading

Young readers now have a new opportunity to explore the world of literature thanks to the launch of gamified e-books, and teachers have taken advantage of gamification's capacity to increase student engagement. The "Khan Academy", which is a free educational resource, employs a badge system to represent a user's level of knowledge of a certain subject. In addition, many publishers of textbooks (e.g., McGraw-Hill's "Connect" program) provide supplemental online exercises for their published textbooks. These exercises come replete with leaderboards and statistics that allow students to measure their progress as they go through the exercises. As claimed by Johns et al. (2018), the stated goals, regulations, and success mechanisms included into gamification have the potential to encourage pupils. Additionally, empowering groups to compete against one another or work together might enhance the amount of social contact. It has been shown by Lisenbee and Ford (2018) that interactive elements accelerate children's interest in reading along with their passion for the activity, which in turn makes them more likely to read books. Reading programs have been shown to be predictive of future performance and growth, and research has revealed that engagement to read is connected to commensurate motivation to do so (Verhoeven et al., 2020). Reading incitement should be tackled by educators in the 21st century in the areas of recognition, resolution, self-efficacy, curiosity, and general and social reading enthusiasm, according to Toste et al. (2020), who classified these areas as subfactors of reading motivation. Reading is associated with a child's level of reading passion, the amount of time spent reading, and the development of literacy abilities, as stated by Egert et al. (2022). It is anticipated that early reading parental and educational assistance will have a substantial influence on children's ensuing reading success; this is due to the fact that children are more instigated to read when they are younger.

Research Concerns

This investigation is designed to answer the following questions:

Research-Questioner 1 (R-Qer1): Does the availability of gamified e-books, customized e-books, and PDF e-books for fifth-grade EFL students have a substantial influence on their tendency to read printed books, compared to those who do not have access to these electronic books?

Research-Questioner 2 (R-Qer2): Do fifth-grade EFL students who read printed books manifest a significant difference in reading comprehension, in comparison to those who peruse gamified e-books, individualized e-books, or PDF e-books?

2. Method

The primary objective of the present study was to interrogate the effects of reading e-books on the engagement and knowledge of EFL students in the fifth grade, in public school settings. Reading motivation was determined using a four-choice exam, and pre- and post-study reading comprehension assessments were given. Due to the constraints of the research design, a random sampling method was not possible, therefore participants were instead clustered based on their outward appearances of similarity, rather than their actual shared characteristics. This disproves the hypothesis that the two sets of people were identical.

Research Design

Before the experiment, each of the hereunder four groups was provided with three hours of training, after which they read a work belonging to the genre of "fiction", chosen to improve their skills in areas such as (a) formulating and responding to questions about the

text's most central elements; (b) retelling the story; (c) recounting the story's characters, setting, and figurative moments; and (d) using descriptive language and visuals to bring the plot's characters, setting, and events to life. Each of the four electronic book treatments was tested in one of four distinct contexts.

A Reading Group with a Twist of Gamification ($n_1 = 21$*)*

To enhance their reading comprehension and fluency, students were accommodated with in-class instruction before participating in the guided reading study. Students spent 80 minutes in total listening to, reading, and being evaluated on books selected for them based on their particular reading levels. These lessons, which employed the "Raz-Kids" program, were necessary for all 21 pupils in the class. There were individual logins for each student, and the classes were adapted to each learner's current aptitude.

E-Book Discussion Group with Individualized Selections ($n_2 = 21$*)*

Twenty-one students took part in a twice-weekly, personalized reading program extending over five weeks. Each session lasted 80 minutes. The program was required during all sessions, and every student had their own login and password to access the individualized interface designed for their reading level. Each pupil was given a book at their independent reading level of achievement and afforded 80 minutes to read it, and then to take the accompanying assessment. The program's full potential could not be realized due to time constraints. Guided reading is a method that has been studied extensively, but teachers have been using techniques to improve students' reading skills long before this.

A Reading Guide for the PDF Format ($n_3 = 21$*)*

Each class lasted 80 minutes throughout the course of the five-week program. Each of the twenty-one students present would take turns reading aloud from their own copy of the electronic book displayed on their PC screen. Students were allocated 80 minutes to skim and take evaluations according to their individual reading ability. There were instances where they could only access the PDF archive and no other internet sites.

The Printable Guided Reading Course ($n_4 = 21$*)*

The 21 participants met for a total of 80 minutes over a period of five weeks. The instructors would hand out printed copies of the book and homework assignments at the start of class. They spent the 80 minutes per session on reading activities and tests designed for their skill level.

Subjects and Contexts

Eighty-four fifth-graders ($N = 84$) from four different urban, state schools in the Greek prefecture of Magnesia participated in the research during the first trimester of the 2021-2022 scholastic year. All students attended a three-hour English as a foreign language (EFL) class taught by a Greek EFL teacher, together with a two-hour communication skills (CS) class explicated by a native English speaker once a week. Both 10 and 11 year olds participated in the classroom experiment, which lasted 80 minutes for every book (approximately two lesson hours), on a weekly frequency. The researchers are themselves educators; thus, they were present for the duration of the presentations made by the Greek EFL teachers to fifth-grade classrooms in the examined public schools. Teachers checked students' understanding with both ongoing activities and final exams. Investigators zeroed down on pre-teens with a stellar command of the English language at the elementary school level. Nonetheless, people differ greatly in their favored modes of instruction, second-language comprehension levels, and areas of interest.

Intervening Equipment

The "Raz-kids" series comprises five books, namely "Brainstorm Bear", "Different", "My Bones", "If I Were in Charge", and "John's Stop Sign". The students had the flexibility to work on their own schedule using a desktop computer, headphones, and a mouse. The researchers collected all survey responses in written form and compiled them into spreadsheets using the "Microsoft Excel" program.

Methods and Equipment for Data Collection

Testing Your English Proficiency

The caliber of English proficiency among students at the moment of the study was assessed using the Cambridge Movers Sample Test. Researchers and adept EFL instructors from the same schools and classrooms conducted the evaluation. To maintain consistency in scoring, the scorers convened meetings to discuss and debate their individual results after separately reviewing each competence test.

Reading comprehension exams

At the conclusion of each story, students were given reading comprehension tests to measure how well they understood the subject provided. A battery of reading comprehension exams was devised to assess how well each student understood the information delivered over the course's five weeks. Components for vocabulary, narrative components, issue and solution, detail analysis, major concept and detail identification, and total reading comprehension scores were included in the produced reading comprehension assessments. Lexile, Reading Recovery, and the Developmental Reading Assessment were also used to identify each book's reading level.

Readability Motivation Survey

In this study, an adapted "Reading Motivation Questionnaire" (Toste et al., 2020) was utilized to evaluate participants' responses before and after their participation in gamified reading courses (see Table 1). The point was to gain insight into whether any progress had been

made in getting people excited about reading. Schools disseminated the survey and informed students that they could respond honestly to any of the questions. Participants could respond to each question on a scale of 1 (very different from me) to 4 (highly similar to me). The inquiry didn't have to be finished in one sitting and could be taken as long as the participant needed to finalize it. General reading motivation was broken down into its component factors, which included recognition of accomplishment, competition, self-efficacy, social ability, curiosity, and reading itself. To establish the internal consistency reliability of the questionnaire, data from the pilot study was descriptively analyzed in SPSS 22.0, resulting in a Cronbach's *alpha* value of .91, indicating the questionnaire's reliability.

Procedures in order

The Cambridge Movers test was used by the researchers to gage the children's English abilities. To ensure that the test was sufficiently difficult, 21 randomly chosen fifth-graders took a practice version. Subsequent to the piloting method and data analysis, all four groups of participants underwent the sample test at the same time; the whole process, including data analysis, spanned around 65 minutes. We performed the intervention and assessment in class because we required a peaceful, undisturbed environment. Starting the next week, children participated in the intervention by reading a single fake novel once a week. During the intervention, the youngsters read an electronic book on their own time. For each book, students completed 10 reading comprehension questions. Every class meeting included the presence of both researchers and schoolteachers. After the 5-week intervention, students took the "Reading Motivation Questionnaire" post-test.

3. Results

This study made use of quantitative data collection methods, such as the Reading Comprehension and Reading Motivation questionnaires, which were administered to the students both before and after the research session. The results of these surveys were scrutinized and compared. The data were analyzed using SPSS 22.0 for Windows. For pairwise comparisons of the quantitative data, statistical methods such as the Kruskal-Wallis test, the Mann-Whitney *U* test, and the Wilcoxon test were implemented. Because of the limited availability of statistical power, non-parametric tests were harnessed. In addition, a Chi-square test was run to evaluate the degree of similarity amid the two groups with regard to the occurrence of certain characteristics. To analyze the differences in continuous quantitative data between the groups, the Kruskal-Wallis test was carried out. Besides that, the Mann-Whitney *U* test and the Wilcoxon signed-rank test were utilized to investigate the disparities further. The Mann-Whitney *U* test was employed to probe further into the disparities, whereas the Wilcoxon signed-rank test investigated the distribution of results in repeated measurements between groups. The statistical analysis found that there were significant distinctions betwixt the groups, with a *p*-value lesser than .05 being adopted as the criterion for determining whether or not the differences were significant.

Table 1. This is a survey of people's attitudes about reading.

Children Statements	Differs a lot from me	Differs a little from me	A little similar to me	A lot similar to me
1. The next school year will find me surrounded by the best readers in my group. (efficacy).				
2. I have a high level of competence in reading. (efficacy).				
3. During my academic career, reading has been the single most helpful activity for me. (efficacy).				
4. If my professor raises a question, I may look into it more. (curiosity).				
5. My interest in reading stems from my desire to learn more about the world. (curiosity).				
6. Knowledge is power, and reading allows me to get more insight into topics adhering to my interest. (curiosity).				
7. Being the sole student in the room to properly identify a passage's author is one of my favorite feelings. (competition).				
8. When I can, I like to finish the reading for class before we even start. (competition).				
9. Somehow, I need to know that I am among the ranks of accomplished readers (competition).				
10. It would be nice if the teacher thought I was a good reader. (recognition).				
11. Several of my friends have remarked on my extensive library. (recognition).				
12. It brightens my day if anyone likes what I've written. (recognition).				
13. I often share books with my sibling. (social).				
14. Books are often a topic of conversation whenever I get together with my pals. (social).				
15. The library is a great place for me to spend time with my family when we have some spare time. (social).				

16. The reading assignments I had to do at home always got pushed off until the last possible moment. (compliance).				
17. I am the kind of student that always does their homework to the letter. (compliance).				
18. If I want a good grade, I have to finish my homework and turn it in on time. (compliance).				
19. Reading is something I do, inasmuch as I have to. (compliance).				

Findings on the Effects of Reading Ambience Variables on Inspiration to Read

With a view to evaluate whether or not there were any changes, this research examined the reading motivation ratings of groups who were exposed to various reading environments (paper books, gamified e-books, customized e-books, and PDF e-books). According to the findings illustrated in Table 2, the students who were given individualized PDF e-books were able to report greater levels of self-efficacy (M = 4,716) than the students who were dispensed generic PDF e-books (M = 2,977). To boot, as compared to students who browsed through printed books for treatment, those who utilized personalized e-books and gamified e-books had higher mean scores (M = 3,581).

Table 2. Analyzing the consistency of reading motivation measurement across groups

	Reading group for personalized e-books (n = 21)		**Group reading of PDF e-books (n = 21)**		**E-book reading Group with gamification (n = 21)**		**Group reading from printed books (n = 21)**				
Groups	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***KW***	***p*-value**	***D***
Pre self-efficacy	3.717	.634	3.645	.766	3.913	.838	3.831	.744	11,856	.227^{ns}	
Post self-efficacy	2.516	.449	3.755	.817	2.5810	.468	3.785	.575	45,793	.0*	2 > 1
											4 > 1
											4 > 3
											4 > 2
Pre-competition	3.827	.784	3.871	.957	3.848	.769	3.862	.011	11,787	.215^{ns}	
Post-competition	3.116	.673	2.980	.848	3.855	.233	2.178	.240	61,239	.0*	2 > 1
											3 > 2
											2 > 1
											3 > 1
											4 > 2
Pre-curiosity	3.527	.885	3.437	.654	3.487	.823	3.479	.371	11,547	.233^{ns}	
Post-curiosity	3.858	.644	3.258	.575	3.839	.446	3.258	.286	60,478	.0*	2 > 1
											4 > 3
											2 > 1
											4 > 1
Pre-compliance	2.123	.524	2.175	.538	2.133	.528	2.139	.535	11,774	.024^{ns}	
Post-compliance	2.664	.433	2.216	.888	2.133	.647	3.548	.223	32,378	.0*	2 > 1
											3 > 2
											4 > 2
											4 > 3
Pre-social	3.868	.844	3.639	.687	3.881	.743	3.858	.111	11,228	.028*	
Post-social	3.053	.384	3.020	.549	3.095	.594	2.814	.112	14,783	.115*	2 > 1
											3 > 2
											4 > 3
Pre-recognition	2.173	.618	2.181	.583	2.181	.523	2.184	.556	11,136	.227^{ns}	
Post-recognition	2.473	.618	2.181	.581	2.681	.523	3.584	.556	45,134	.0*	2 > 1
											3 > 2
											4 > 3
											3 > 1
											4 > 1
Pre-general reading motivation	3.658	.358	3.678	.578	3.424	.355	3.545	.244	11,264	.124^{ns}	
Post-general reading motivation	2.378	.378	3.998	.578	2.424	.354	3.547	.244	52,264	.0*	2 > 1
											3 > 2
											4 > 1
											3 > 1
											4 > 2

Note: KW stands for Kruskal-Wallis. *$p \leq .05$ for Kruskal-Wallis H Test. ns is for non-significant ($p > .5$).

The post-competition results were subjected to statistical analyzation, which disclosed that there were significant differences between the student groups [2(3) = 61,239; $p > .000 / .05$]. After the competition, those participants who were given the treatment of reading gamified e-books (M = 2,966) got scores that were considerably higher than those participants who were assigned to the approach of reading customized e-books (M = 3,227). When the post-test scores of gamers and readers of PDF e-books were contrasted, it was discovered that gamers had a higher mean score (M = 3,871) than PDF e-book readers (M = 2,966). After the conclusion of the competition, individuals who read gamified e-books had a greater gain in their scores (M = 2,966), as opposed to those who delved into paper books (M = 2,289). When the participants' post-competition grades were compared, those who had received individualized e-book reading treatment (M = 3,227) did much better than those who were exposed to printed book therapy (M = 2,289) Last but not least, the post-competition scores of those who had read PDF e-books before the competition (M = 3,871) were either equal to or higher than those who had read paper books (M = 2,289) prior to the competition.

Table 3. Statistics describing reading comprehension among various populations

	Reading group for personalized e-books (n = 21)		**Group reading of PDF e-books (n = 21)**		**E-book reading Group with gamification (n = 21)**		**Group reading from printed books (n = 21)**				
Groups	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***KW***	***p*-value**	***D***
1st-week story elements	.938	.473	.818	.556	.818	.556	.818	.556	2,335	.785^{ns}	
5th-week story elements	.668	.616	.878	.527	.889	.316	.878	.527	8,744	.028*	4 > 2
1st-week main idea and details	.788	.448	.889	.316	.878	.527	.818	.556	6,848	.116^{ns}	
5th-week main idea and details	.938	.473	.938	.473	.788	.448	.789	.594	4,743	.279^{ns}	
1st-week problem and solution	.828	.394	.613	.623	.938	.473	.828	.394	18,113	.012*	2 > 1
											4 > 3
											3 > 2
5th-week problem and solution	.857	.554	.668	.616	.938	.473	.938	.473	4,388	.154^{ns}	
1st-week analyze character	.728	.587	.938	.473	.789	.594	.818	.556	3,886	.425^{ns}	
5th-week analyze character	.889	.316	.878	.527	.788	.448	.788	.448	2,128	.395^{ns}	
1st-week vocabulary	.728	.587	.857	.554	.789	.594	.889	.316	7,466	.031*	3 > 2
											3 > 1
											3 > 2
5th-week vocabulary	.668	.616	2.111	.011	0.459	.510	.889	.316	26,618	.012*	4 > 3
											3 > 2
											4 > 1
											3 > 2

Please, take note of KW = Kruskal-Wallis; *$p \leq .05$; and ns = not significant ($p > .5$).

This text's most essential aspects are student groups' considerable post-reading rating variances (see Table 2). Gamified e-books had much lower post-reading interest, up against PDF e-books. Personalized e-books also increased curiosity more than printed books. Likewise, the groups differed in post-test compliance; printed book readers had greater pre-curiosity than individualized digital book readers.

Post-event answers of pupils from the two groups markedly differed [2(3) = 14,783; $p \leq .000 / .05$]. PDF and gamified e-books outperformed paper books in post-social ratings and post-reading recognition scores. Customized e-books obtained lower post-recognition points (M = 2,473) than printed books and generic e-books. Students who were educated to read e-books on tablets (M = 3,269) were more motivated to read following training. Personalized e-books motivated readers more than printed books. PDF e-book users were more stimulated than print book readers.

Examining the Role of Ambient Factors in Reading Performance

An investigation was carried out with the purpose of determining whether or not there was a correlation between reading comprehension and the following four diverse environments: print book, gamified e-book, customized e-book, and PDF e-book. The spectrum of comprehension skills is displayed in Table 3. Following the first week, there were noticeable discrepancies between the groups in terms of their ratings on both the issue and the answer. In the first week of school, there was a difference in vocabulary scores that was statistically significant medially the two groups [2(3) = 8.36; p = .03]. Higher vocabulary scores were achieved by students in both the print book group and the printed book reading group during week 5 of the school year.

While comparing the two groups on the different aspects of reading comprehension, there were not found to be any significant variations between them (i.e., narrative factors, character analysis, primary idea and details, problem, and solution). The Wilcoxon test revealed no consequential dissimilarity in the post-test mean scores for general reading comprehension within the harmonized groups.

4. Discussion

In this research, English language learners in fifth grade were given four distinct reading styles, and their cognizance and interest levels in reading were compared across all four. The idea that reading printed books would result in less incentive to read than reading other forms of e-books was put to the test with the intention of disproving the null hypothesis. According to the findings of the research, employing tailored and game-like e-book reading sessions had a considerable impact on the reading motivation of the participants in the study. This was exhibited by significant changes in the participants' motivation ratings both before and after the survey. The study also discovered that having pupils evaluate their own work increases their engagement with and comprehension of digital materials, and that students' confidence in their academic abilities may increase when they take charge of their education by setting goals, selecting appropriate teaching methods, and reflecting on their progress (Egert et al., 2022; Lacka et al., 2021). Students who read customized, gamified, and PDF e-books felt more confidence in their skills, in contrast to those students who read the printed textbooks that were utilized as the control group's materials. This was the overall finding of the study.

By the same token, the authors intended to discover any kind of connection between the levels of intrinsic desire held by pupils and the real reading ability they possessed. Since the majority of children were of low reading proficiency and limited variability, it was difficult to evaluate the potential benefits that may be gained from a gamified environment in terms of the results (floor effect). As a corollary, it is fair to anticipate that students, both within and outside of the classroom, might benefit from being encouraged to read at their own speed and in a manner in which they find enjoyable (Goosen & van Heerden, 2019).

In this study, the performance of students on a standardized exam was compared with their real understanding of printed and online material. Participants were Greek fifth-graders studying English as a second language in primary schools. In order to explore the impact of different types of texts on comprehension ratings, the data that was gathered and evaluated was employed. On the report of the findings of the survey, students' test results did not increase if they dove into printed or digital resources to prepare for their exams. Participants who read customized and gamified e-books fared better on vocabulary problems on the reading comprehension exam than the PDF e-book and print groups, indicating the highest growth.

On a single one of the 17 occasions when the students sought for guidance with vocabulary, none of them approached their professors for aid. Although it is possible that students who read print books also received assistance with their vocabulary from their lecturers, it has been documented that these same students discovered that e-books provided more seclusion than print books, which required them to ask for assistance from their teachers in a more public setting (Ferraro, 2018; Merga, 2021).

The reading comprehension of fifth-grade students learning English as a second language was investigated in a research that compared reading printed books versus reading various forms of digital books (Kong et al., 2018). The accumulated and analyzed data showed that there was no discernible difference in the exam results of pupils who read printed books vs. those who navigated themselves into digital books. Students who capitalized on customized and game-like e-books seemed to have the most substantial gain in their ability to answer vocabulary questions. It was hypothesized that students would have more privacy while using e-books, a fact which would eliminate the need for them to openly seek aid from their teachers. When it comes to elucidating complex concepts to youngsters, a combination of an electronic book and an online dictionary could prove to be helpful in improving their level of understanding (Stølle et al., 2020). Equally, e-book readers and websites that are relevant to the subject matter enable students to read at their own speed and give the opportunity to seek assistance without distracting them from the content they are focusing on (Liman Kaban & Karadeniz, 2021).

5. Conclusions

The current study is expected to have implications for educators, professionals, and researchers involved in developing new educational resources. Initial results indicate that exposure to electronic reading (ER) may be beneficial for language and reading proficiency among children. Additionally, the data collected provides enlightenment into the experiences and perspectives of Greek fifth-grade EFL students and their teachers regarding ER. The findings highlight the potential of ER for enhancing reading and language skills, and facilitating the learning of an additional language (L2) by means of reading. Collaborative reading activities, rather than relying solely on the instructors, were found to enhance students' engagement and motivation. These results support the integration of ER sessions into EFL curricula to precipitate students in improving their language and reading abilities, and to facilitate L2 acquisition through reading.

The results demonstrate that customized and gamified e-books are not only a feasible substitute for conventional books, but also serve as highly effective educational tools. Consequently, it is essential for user-friendly digital books to become the norm both in schools and homes. The study has established that personalized and game-based digital books can significantly enhance young children's precocious text comprehension, which is fundamental for unfolding advanced reading dexterities. These findings propose that incorporating screen-based reading instruction in EFL classes is a productive approach to optimizing students' reading abilities and stimulus.

Fifth-grade students were chosen as a valid sample in this study owing to their degree of reading competency, with word recognition skills necessary for effective reading in a range of contexts often present in children at this age. What is more, students at this stage possess reading abilities that include both pleasure reading and critical thinking (Kim et al., 2018). The authors suggest some recommendations

for future research, as only 84 individuals completed the survey, and most of them struggled to comprehend what was presented. Future investigations could benefit from a larger sample size and a wider range of participant skills. The study's small sample size reflects its exploratory and pilot nature, and future studies of this kind may have a broader scope. In line with statistical studies, e-books improve students' reading comprehension more rapidly than conventional books, making it critical to continue exploring the most efficient methods for using e-books in the classroom (Zainuddin et al., 2020). The study had some limitations, such as offering only 10 classes per week for a five-week period and failing to administer a memory test before the follow-up study. To evaluate the program's long-term effects, participants ought to be given a retention test at a later date. In conclusion, all participants in this study obtained their reading constituents from a single database called "Raz-Plus" (www.raz-plus.com). Thereupon, if screen reading sessions included a wide range of book sources, students could benefit from increased exposure to different literary styles.

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