



Effectiveness Of Digital Text in Interactive Library for English Starters (Digi-Tiles in Enhancing The Reading Comprehension Of Grade 3 Learners)

Jujie Laroza¹

¹ Department of Education, Division of Calamba City, Philippines

Received: July 18, 2022	Revised: April 10, 2023	Accepted: October 20, 2023	Online: October 31, 2023
-------------------------	-------------------------	----------------------------	--------------------------

Abstract

This quasi-experimental study was conducted to measure the effectiveness of Digital Text in Interactive Library for English Starters (Digi-TILES), which is a digital learning tool, in improving the reading comprehension level of Grade 3 pupils of Sampiruhan Elementary School. The intervention tool was designed to develop reading comprehension of learners and results were measured through comparing pre-test and post-test scores. Two (2) paired groups of learners participated in the study composed of 30 members for each group. Each group's reading comprehension level was determined through standardized Phil-IRI materials. The digital tool intervention developed by the researcher was utilized by the experimental group while the comparison group utilized plain printed Pivot Self Learning Modules distributed by Department of Education. Paired and Independent Samples T-tests were used to answer the inferential questions of the study. The experimental group, after utilizing the intervention tool scored higher in their post-test than the comparison group. Comparing also the pre-test and post-test of the experimental group, it is notable that the scores in the latter are significantly higher. This implies that the Digi-TILES learning tool has impacted the learners' reading comprehension positively. The hypotheses stating that there is no significant difference between the post-test of the two groups were rejected. The findings therefore reflect that the experimental group scored higher those in the comparison group. The Digi-TILES therefore helped in enhancing the reading comprehension of Grade 3 learners. It is therefore suggested that the school may consider utilizing this tool to improve the quality of learners when it comes to reading comprehension.

Keywords: *Digital text; learning; online library; English starters*

INTRODUCTION

Reading comprehension has been deemed the goal and purpose of reading. People read to understand the concepts written, to learn new things, and to explore the world around them. Reading comprehension sets itself apart from mere word recognition, as one can read, but without comprehension skills, he/she will not be able to understand the ideas written in the text. Comprehension makes reading an endeavor worth one's time as it makes the experience more enjoyable and instructive (Brandon, 2021).

As it is an essential skill for one to learn, there are several strategies that early language learners may be able to use to improve their reading comprehension, such as predicting, connecting to one's prior knowledge, imagining, and summarizing. These are a few of the many strategies that learners must be exposed to, emphasizing the complexity of reading comprehension as a skill.

It is certain and undeniable that reading comprehension will assist a child growing up and an adult in his or her daily undertakings. Mastering this skill can be indicative of a person's success in life as almost all real-life situations require us to read, think, and comprehend (Ben-Aharon, 2021). Comprehending the texts we read helps us unravel the world around us and assists us in



communicating with others, either orally or in correspondence. Our reading comprehension skills also allow us to build deeper connections and network with other people. In schooling, without reading comprehension skills, a learner may struggle academically as reading is considered to be the major foundation of all other subjects.

Reading comprehension and the extent of its influence in our daily lives and in early education highlight the importance of learning it. As academic progress is deeply dependent on reading comprehension skills, it is clear that this skill must be given due attention. However, as the country and its educational system progress, the Philippines may be facing challenges as regards to its early language learning, particularly of the second language, English. As the international education company Education First (EF), based in Switzerland, measured in the 2019 English Proficiency Index (EPI), the Philippines plunged from the 20th to 27th place in the ranking. This is out of 2.2 million participants in the EPI, who were from 100 countries. While the ranking is considerably above average, the decline is also immensely noticeable.

Malacañang even admits the country's current status, revealing that the "poor reading comprehension of Filipino students is a reality." This came to light immediately after the exposure of the 2018 Program for International Assessment (PISA) results, showing that Filipino learners scored below the average score and found acceptable. The Philippines was ranked last out of 79 countries (Manaog, 2020).

This being the struggle at hand, challenges the educational system of the country and its personnel, particularly our elementary school teachers, who hold upon their shoulders the responsibility of laying out the foundations for excellent reading comprehension. However, there are also several factors that might have affected this low reading comprehension level, such as poor study habits; interference of technology considering the huge amount of time learners allot for the use of gadgets, the internet, and social media; parental support and motivation in their children's education; the effects of DepEd Order 40 s. 2012 or the Child Protection Policy, leading learners to become "too pampered," and many others. However, with all these factors seen and considered, one cannot deny the actuality of the situation.

Even as educators have seen, recognized, and analyzed the factors inducing poor reading comprehension, the fact remains that this decline is manifesting not just in numerical values in test and survey results, but most significantly, in the field where teachers assess their learners first-hand. Attempts have been made by the department to raise the reading comprehension of learners, such as the strengthening of the 3Bs Initiative (Bawat Bata Bumabasa) stipulated in DepEd Memo No. 173 s. 2019, urging all Regional Offices, Schools Division Offices, and teachers to prioritize reading to raise the quality of learners under the department. Within such memorandum, all other subparts of the department to realign their priorities and activities towards reading. The schools' Maintenance and Other Operating Expenses (MOOE) shall also be used to fund reading literacy initiatives and other efforts to promote the culture of reading among learners.

The regression in reading comprehension levels among learners has already been evident during the time classes were conducted face-to-face. And naturally, the COVID-19 pandemic has also taken its toll on this decline (De Vera, 2021). Learners' exposure to school reading materials and to face-to-face learning experiences with the teachers were put on hold for quite a long time. Pursuant to the DepEd Order No. 012, s. 2020, which contains the Basic Education Learning Continuity Plan (BE-LCP), the department took steps for children to still have access to learning through the implementation of different learning modalities. As schools across the country may vary in many factors related to the implementation of the modalities, the department mandated schools to conduct surveys to gain opinions and suggestions from parents, which could potentially lead schools to choose the modality to be implemented. As expected, a number of schools hold online synchronous and asynchronous classes while some adopt solely the modular print learning

modality. Education Undersecretary Diosdado San Antonio said that almost 13 million public school students, or 59% of roughly 22 million enrollees this year, are set to access education through printed modules.

As roughly half of the learner population of the country are learning at home with only their self-learning modules at hand, it may be difficult, especially for young learners, to learn independently. Furthermore, this poses a risk of a potentially larger decline in reading comprehension skills among learners because they are now at home with little to no exposure to informative and pleasing reading materials, little to no interaction with teachers, a non-conductive learning environment, and most likely a lack of opportunities to practice reading and comprehension of English reading materials. Moreover, teachers in the field, aware of the situation, are devising means to assist learners even remotely.

As we are under remote learning and with the emerging advantages of using technology in education, teachers are now encouraged to innovate and think of ways to digitize their classrooms (Holland, 2017). One way to effectively use technology to its advantage is by utilizing digital tools to deliver instruction in an engaging manner for learners. It goes beyond replacing the traditional chalk and board with PowerPoint, but most especially designs interactive activities for learners to answer and grants them the opportunity to collaborate with one another (Garnier, 2020).

Combining digital technology and the importance of reading comprehension, the need for an interactive digital library is seen to have the potential to enhance reading comprehension skills among learners. Educators have consistently identified the emerging need to digitize learning methods as a major challenge (Bhattacharya, 2020). Educators have been moving towards a digital transformation of their classrooms, and most of these attempts are intended to upgrade the reading experiences of the children. As children go online, teachers also need to be well-adept at navigating through these platforms and tools. Not only do teachers need to familiarize themselves with online platforms, but they must also have the initiative to come up with innovations and new tools that may assist them in delivering instruction.

According to Abraham (2020), interactive libraries are seen to have promising advantages among learners, especially now that they are used for remote learning. The extent of its impact among learners is seen to be rapidly increasing. Any subject matter, if correctly done, instantly becomes attractive, colorful, more engaging, and more interactive for learners when they are converted to digital texts stored in interactive libraries.

Digital libraries, as regarded by Rendina (2019), are the future of education. This is a technological advancement that is set to be a mainstream tool in the years to come as more and more learners will have to access information online. This demand for fast access to information that they can access in the palm of their hands will likely be a trend in education in the future. It is for this reason that educators should be trained to convert printed lessons into interactive e-books and compile them into a digital library.

Coldewey (2019) also cited the ways in which digital books can help children learn better. Anything colorful and moving may help the learners increase their engagement in the lesson and improve their retention of it. These advantages are further enumerated by Harman (2018). Not only is digital text advantageous for learners or readers, but also for publishers or creators. If a certain modification has to be made, the creator can modify the text and the changes will be applied in real time. This alleviates the cost of printing, which is one major problem when a book gets published and errors are detected. Likewise, content creators can integrate multiple activities or games into an e-book by merely adding links to sheets.

Reading comprehension is an essential skill for learners and a skill greatly affected by remote learning. The declining level of English reading comprehension is alarming, and for this reason, this research proposes an intervention in the form of digital texts compiled in an interactive library that

learners may access. As previous discussions have been made highlighting the advantages of using digital text in teaching reading, the researcher will craft a digital tool that compiles reading materials into one interactive library. This aims to raise the level of reading comprehension in English among young learners.

LITERATURE REVIEW

Reading Comprehension as a Substantial Developmental Skill

Having good reading comprehension skills greatly benefits learners. This assists them in their growth, progress, self-enhancement and many other aspects of their lives. When a child learns to comprehend what he/she is reading, imagination is activated and the doors to new worlds open up for them. According to Nord Anglia International School (2020), a child must be taught how to read and comprehend at different paces depending on the children's learning development. This means that learning and mastering reading comprehension may develop differently for diverse learners. However, it is a must that as soon as the child is able, parents must begin to expose them to reading materials that will slowly increase their reading capacity. Though too early, this will be beneficial for the child as he/she will be able to gain the following: build vocabulary, enjoy the development of his/her imagination, promote mental well-being, enhance skills helpful for schooling and education such as concentration and critical analysis, and overall help them in their future conversation with peers or with other people.

As this skill is seen essential, this have been the topic of focus for numerous research in the past aiming to gauge the reading comprehension of learners. International metrics have also introduced attempts to evaluate countries literacy rate and learners' academic performance. One common key indicator in these metrics is the reading comprehension level. In a study conducted by Miñoza and Montero (2019) which aimed to assess the reading comprehension level of intermediate pupils, several factors have been eyed to have effects in learners' reading comprehension.

These factors are the pupils' Socioeconomic Status (SES), their age, motivation to learn, and parents' involvement in their children's education whether in school or at home. The study concluded that comprehension of the pupils is greatly affected by their Socioeconomic Status (SES) favoring those with high SES. It is also recommended in the study that teachers must give emphasis to enhancing learning experiences given to pupils to effectively teach English to these learners. This shows how complex reading comprehension is and how it is affected by factors generated by the child intrinsically or gained within the learning environment.

The Country's Reading Comprehension Status

This reading comprehension state of a country had already become an issue of concern even as the reality of the problems began to surface one by one. Frederick S. Perez, current president of the Reading Association of the Philippines (RAP) as cited by Manlapig (2020) reiterates that the scores that Filipino learners achieve in standardized tests are noticeably below average especially in the National Achievement Test (NAT) and National Elementary Achievement Test (NEAT). Perez further explains that this low level of reading comprehension may have come as a result of improper and inadequate instruction in literacy and numeracy.

The regression is also seen rooted to the absence of efforts to realign our orientation of reading especially now that we are teaching 21st century learners. Reading comprehension in this generation should no longer revolve on understanding simple stories and narratives but rather immerse learners into understanding expository text with them analyzing factual information. This is further supported in the recent PISA tests as it centered around facts, information, expository texts, and interpretation of graphs.

Addressing Reading Gaps

For this matter, teachers have been encouraged to attend reading instruction and strategy training to capacitate themselves on proper teaching of reading for them to be able to effectively transfer this skill to their learners. Adequate trainings must also be given to educators to keep them abreast of recent trends in teaching reading (Roper, 2019).

While educators are being pressed to take action, another factor that may be inducing low comprehension level among Filipino learners is being considered and magnified and that is lack of high-quality reading materials. Schools, such as the University of Santo Tomas, have been looking into the improvement of facilities and materials to adequately respond to the need of raising the literacy and numeracy of learners (Dispo, 2020). Good quality reading materials are sought after to ensure that all learners will be engaged in reading and will develop the good habit of reading. Furthermore, school facilities must also be improved to make sure that there will be places conducive enough for learners to read. These discussions and efforts have been made after the recent PISA results.

Aligned with this, the culture of reading is also perceived as one of the causes of poor reading comprehension along with non-mastery of the elements of reading, and presence of learners-at-risk (Tomas et al., 2021). In this study entitled *The Perceived Challenges in Reading of Learners: Basis for School Reading Programs with 4216 participants from Grades 1-7*, the challenges of the students were described as well as the school projects and initiatives for the enrichment of reading, and the stakeholders' support; all these for the to eliminate the reading comprehension challenges of the learners.

Furthermore, as these initiatives should be implemented, an even larger problem emerges which is lack of structural support. Despite education taking the biggest allocation from the national budget, lack of structural support such classroom constructions, teacher trainings, textbook, and other reading materials, are still being the major challenges of schools and educators (Abeberese et al., 2016). Further underlining the lack of effective reading materials, according to Philippine Human Rights Information Center in a published report in 2016, the insufficiency of instructional materials dreadfully hampers the progress of Philippine education.

According to Reading Horizons (2016), poor reading materials will naturally result to poor reading skills which will in turn influence the child in more aspects of their lives. This will impact them academically as they will undoubtedly struggle in school to keep up with their classes if they find it difficult to read. This may also impact them emotionally. As they begin to look around and see that their classmates or peers are able to read, they may possibly gain a feeling of being unintelligent. This lowers their self-esteem and may take a toll on their mental health and motivation to go to school. And as this low level of reading brings them down emotionally, they may begin to drift away from having close peers. This shows that not only their grades get affected by low reading comprehension but also the foundations of their social interactions. This takes root in the quality of reading materials the child is exposed to at home and in school.

Reading Status Amidst Pandemic

According to the study of Sucena et al (2022), Reading skills intervention during the Covid-19 pandemic, the measured reading ability of the students involved in the study during the onset of the pandemic was alarming as over one-fourth of the population are classified under having poor reading skills, most specifically those from low SES. This only presents the actual data bearing the effects of the CoViD-19 to the educational system most especially because students now have to study and read online, a platform not much of the learners are used to. Having this data, the authors

attempted to implement a 5-week intervention called Reading Skills Consolidation Program (RSCP) where in children were taught online by the teacher using a structured teaching strategy in decoding and letter recognition. The intervention resulted to a significant improvement in the participants' reading skills.

Early language literacy as compared to higher grade levels is noted to have been more affected by the pandemic. According to Souza (2021), children ages 6-8 studying under online environment may have lost the momentum in learning they had during face-to-face classes. As a result, their knowledge of reading basic words may have undergone a slower pace of development as they have been lacking practice and exposure to reading materials. However, it is also good to point out that the online platform is a vast reservoir of valid reading materials that teachers and parents may use to improve their children's reading comprehension. All these still emphasizing on reading being the avenue to develop academic knowledge and skills in all other disciplines (Domingue et al., 2021).

With the global health situation at hand, Ferguson (2020) pointed out the inevitability of using online platforms and digital tools to make reading more engaging for learners. The use of different learning management systems and interactive reading materials will ameliorate the reading skills and reading comprehension of the learners. Online whiteboards for students' collaboration may also be used so that their social interaction will still be practice. Educators may also utilize online games and conduct virtual gallery walks where in the learners' prior knowledge of the text to be read is activated. All these tools accessible online may be of help learners gain higher reading comprehension level.

Digitizing Reading

Baron (2017) discussed how technology have transformed the educational system from teaching, learning experiences, administrative processes, and learners' output. However, there must be a comparison of how well learners comprehend in print and digital medium. Research have been conducted to make such comparison however several research yield different results. In a study by Schugar & Schugar (2016) it was found that middle grade students understand printed text more than digital text. However, the same researcher observed that digital e-books have higher level of engagement from learners. With the fast pace of technological advancement that we are experiencing, learners, educators, and parents expresses different opinions of this argument.

Considering the cost, digital text might gain more leverage as well in efficiency as learners are able to find concepts they need instantly in a digital text. As compared to printed books, digital e-books are more cost-efficient and can be more engaging on the part of the learners. However, printed materials may be better for readers' health as extensive exposure to e-books may cause digital fatigue, digital eye strain and any physical discomfort caused by it (Coombs, 2021). The benefits and advantages of using digital tools are indisputable yet it was further elaborated by Baron that full adaptation of digital tools require more research since digital technology is still on its 'infancy'.

Hurt (2021) also has the same explanation when it comes to whether a person learns better in reading text online or in print medium. Much of the explanation banked towards the advantages of reading printed copies or books. It helps the brain in creating mind maps as we read. When we read through pages, we tend to remember significant parts of the reading based on the pages and being to locate a fact somewhere on the mental map of the page will assist us not only in understanding it but in remembering and retaining the information in our minds. Scrolling through gadgets also take much effort and eye stress than reading through print media. Though scree-based reading is found to be stressful physically and mentally, but its advancement and continuous development sets it apart from printed text. Some platforms may have illustrations that may ease

understanding of the texts, others may have immersive reader features where in the child hears from the device how to read a sentence or a word by merely tapping it. As the generation of readers at present deeply values their time, they would be in need of fast ways to find the gist and good points of a long and wordy article. These features and more are not present in printed text (Jabr, 2013).

In a case study by Wilson (2021), where the researcher designed activities for each level of SAMR and observed whether her learners have exhibited significant changes in their engagement and performance, it was discussed that there were observable positive impacts in the use of technology for the class. As the teacher goes on in upgrading the activities and the use of digital tools from Substitution up to Redefinition, there is also an observable inclination pattern among in the children's engagement.

Humes (2017) in his study *The Impact of TPACK, SAMR, and Teacher Effectiveness on Student Academic Growth in Eighth Grade Language Art and Mathematics*, it was also highlighted that the technology-efficacy of the teacher significantly affects the learning of the children in the classroom. As recommendation, the teachers have been driven to undergo trainings in upgrading their technological knowledge to combine it with their pedagogical expertise. In a study by Goradia (2018), on the *Role of Educational Technologies Utilizing the TPACK Framework and 21st Century Pedagogies: Academics' Perspectives*, the dynamic influence between the three components of TPACK was highlighted. It was concluded that for most educators, the TPACK model is a tool package that they should be knowledgeable about in order to transform their classrooms into a more conducive learning environment.

As said by Lynch (2017), reading in the digital era had to be innovative and revolutionary as the world continues to change towards technological advancement and learners evolve to becoming digital natives. Their interests must be considered and the platforms and strategies in teaching reading must be engaging. One way to achieve these is by using digital libraries. Children must be taught reading through e-books and other digital text platforms.

Several other strategies in teaching reading must also be done such as use of online dictionaries, using quizzes and interactive games to test content and vocabulary retention, and collaborative mind mapping activities. There must be an effort to combine the traditional book reading and digital tools and technology. Digital reading platforms have built-in dictionaries which helps the reader find the meaning of the difficult words instantly and on their own. This makes assistance real-time and personalized (Martin & Rios, 2014). In the same example, reading independently also becomes more evident and practices by learners. The generous use of colors and other illustrations will also be of help in keeping the children engaged in their learning and reading. In addition, some other features of digital platforms is also useful in developing readers' study habits. These features such as highlighting and immediate collaboration with peers may not always be done using print media.

Technology have greatly impacted the lives of the present generation from social interaction, communication, and work. Not only that, but it also significantly transformed the way that children learn. Hence, there is a demand that educators, parents, and learners must be digitally literate (Loveless, 2022).

While people may think that digital literacy is mere knowledge and application of digital tools in learning, it goes beyond such as it also involves learning the rules of authorship to avoid copyright issues and plagiarism and how to exhibit due responsibility in using social networking platforms. However, as the education system transitions into a more digital world, conventional teaching methods must not be set aside this includes textbooks, workbooks, written tests.

Technology in Schools for Reading

Benjamins (2018) offers an evaluative discussion of how technology has shaped the reading skills and development of children over the years. The digital media and reading nowadays are intertwined as the cognitive processes of one's understanding can be affected by reading using digital platforms. As learning is now digital assessment should also be transformed.

As technology and digital platforms are now being used widely in schools and in other fields, the valuing and love for reading must be developed and sustained. Burns (2017) stated that although information and reading materials are readily available online, learners must learn not to just scroll rapidly through the page. They must learn to interact with the reading material, pause, reflect, and really think about what they are reading. As for the educators, they must learn about the learners' interest so that they will be able to use this to design reading materials and activities. Despite the advantages presented by reading online, it is still important to develop among young learners the concept of the true value of reading.

Gilpin (2021) described how public libraries have persistently adapted to the to changing nature of the learners which is now more inclined in using digital tools. Efforts have been made to ensure that Wi-Fi ready computer units are available inside the library for learners to use. The resiliency of public libraries can also be commended even amidst the internet age. During the pandemic, there was an immense outbreak of information and suddenly it seems that everything is now available in the web however it is important to segregate the accurate information from fake ones. In a physical library, one can find true, relevant, and informative texts which is beneficial as it will protect us from misinformation.

Digital libraries are now being introduced as tools to merge the traditional library and the use of technology. These digital libraries are internet websites which main objective is create and preserve electronic book collections and compilation of other kinds of reading materials. This provides an avenue for users to immediately access reading materials and reread if needed without borrowing or purchasing the books (Garcia, 2013).

From these digital libraries, users, at their own pace and time can read the materials they desire to read. It is also seen advantageous as digital copies are not damaged by natural calamities and other disasters. The role of online libraries has also been highlighted especially nowadays that CoViD-19 has coerced schools to adapt to distance learning measures (Zhou, 2021). In fact, the existence and continuous development of digital libraries is seen as possible solutions to the continuity of academic progress of learners whose education is affected by the pandemic (Falt & Das, 2020).

RESEARCH METHOD

This study utilized the Quasi-experimental research design as it aimed to determine the extent of effectiveness of the proposed intervention, Digi-TILES (Digital Texts in Interactive Library for English Starters), to the reading comprehension of grade three learners. A Quasi-experimental research design aims to establish a cause-and-effect relationship between an independent and dependent variable (Thomas, 2020). There was no random selection of participants as the researcher initially evaluated if learners have capability to underwent the intervention in terms of internet access. With the conditions of the research presented, quasi-experimental designed is deemed appropriate. Under such design, the researcher structured the study with the combination of Nonequivalent design and Pretest-Post-test design where in the two groups underwent a Pretest to measure their initial reading comprehension level. The results served as the basis of comparison in the culmination of the intervention. The experimental group was exposed to the intervention while the comparison group did not undertake such intervention. After a period of time, the two groups' reading comprehension was measured with a post-test. The results showed the extent of improvement between the two groups and how the intervention affected the experimental group.

With the nature of the problem at hand, this research method was found to be the most effective.

For the analysis and interpretation of the data gathered, the following statistical tools were used. Descriptive analysis of the mean scores of both groups were obtained as well as the standard deviation for all tests done. Paired T-test was used to compare the mean scores of both the experimental group in their pretest and post-test and to determine if there are significant differences between the two. This verified whether the intervention has affected the reading comprehension of the participants. The nature of effect whether positive or negative was also determined. Meanwhile, to compare the post-test mean scores of the experimental and comparison group, an Independent Samples T-Test was utilized. This provided the researcher with the data needed to determine if the intervention is effective. Moreover, accompanying the Independent Samples T-test, Cohen's d value was also determined. This allowed the researcher to evaluate the extent or size of the effect. For this treatment to be applied, the Standard Deviation of the post-test results of both groups was first obtained. The obtained effect size using the Cohen's d was then interpreted to find out the degree of the effect whether small, medium, or large, using Cohen's determined subgroups.

FINDINGS AND DISCUSSION

The Reading comprehension level of the experimental and comparison group in their post-test as shown in their mean scores is exhibited in Table 1.

Table 3. Post-test Mean Performance Score

Test	Group	Column title-3	Column title-4
Post-test	Experimental	16.67	2.17
	Comparison	14.50	2.47

As shown in Table 3, the mean score of the post-test result of the experimental group is higher by 2.17 than that of the comparison group. The experimental group's average score is 16.67, while the comparison group has a mean score of 14.50. This shows that the experimental group performed better in their post-test compared to the comparison group.

The scores of the comparison group are also more spread out, with a standard deviation of 2.47. This is higher than that of the experimental group, with a 2.17 standard deviation. This shows that the scores of the comparison group are in close clusters.

The experimental group utilized the digital intervention, and after such utilization, scored higher than the comparison group. This further affirms to the study of Coldewey (2019) stating that text or reading selections presented in digital form makes it more engaging for the learners and helps them learn better through the use of active interaction, bright colors, and sounds

The reading comprehension level of the Experimental group as shown in their mean scores for pretest and post-test and analysis of the significant difference are discussed in Table 4.

Table 4. Test of Difference on Experimental Group's Pretest and Post-test Score

Group	Test	Mean	SD	t-value	df	MeanDiff	Cohen's D	Effect Size
Comparison	Post-test	16.67	2.47	6.671 **	29	3.067	1.389	Large
	Pretest	13.60	2.25					

Source: Test is Significant @ p-value < 0.01; Cohen's d: 0.01-0.49: Small; 0.50-0.79: Medium; 0.80 or higher: Large.

Shown in Table 4 is the result of the paired sample t-test employed to determine the statistical difference between the experimental group's pretest and post-test mean level performance. On their pretest, the mean score of the experimental group was 13.60, while the average of their post-test was 16.67. As their post-test average is higher by 3.07, this shows that they performed better in the post-test, which was after the utilization of the intervention. There was a significant difference between the experimental group's pretest and post-test mean level performance conditions [$t(29) = 6.671$, Mean-Diff = 3.067, p -value < 0.01].

The impact of the utilization of the intervention shall be interpreted with the Cohen's D value calculated as 1.389. The value shows that the intervention used had a large effect size or had greatly affected the reading performance of the experimental group.

This affirms with the case study of Manalu (2020) highlighting students' perception on the effectiveness of digital tools in making them understand text better.

The Comparison Groups' post-test and pretest in reading comprehension were compared and the results are shown in Table 5.

Table 5. Test of Difference on Comparison Group's Pretest and Post-test Score

Group	Test	Mean	SD	t-value	df	MeanDiff	Cohen's D	Effect Size
Comparison	Post-test	14.50	2.47	2.672 *	29	0.900	0.381	Small
	Pretest	13.60	2.25					

Source: Test is Significant @ p -value < 0.05; Cohen's d: 0.01-0.49: Small; 0.50-0.79: Medium; 0.80 or higher: Large.

Shown in Table 5 is the result of the paired sample t-test employed to determine the statistical difference between the comparison group's pretest and post-test mean level performance. The post-test mean score of the comparison group is 14.50, which is slightly higher than the pretest mean score of 13.60. The comparison group's pretest and post-test mean level performance conditions differed significantly [$t(29) = 2.672$, Mean-Diff = 0.900, p -value < 0.05].

However, the effect size is small, with a Cohen's d value of 0.381. This demonstrates that the participants made only minor progress between the time the pretest and post-test were given to them.

After the utilization phase of the intervention Digi-TILES, the mean performance scores of both group in their post-test were compared to see if there were significant differences. The findings are shown in table 6.

Table 6. Test of Difference on Post-test score of Experimental and Comparison Group

Test	Group	Mean	SD	t-value	df	MeanDiff	Cohen's D	Effect Size
Post test	Experimental	16.67	2.17	3.606 **	58	2.167	0.933	Large
	Comparison	14.50	2.47					

Source: Test is Significant @ p -value < 0.01; Cohen's d: 0.01-0.49: Small; 0.50-0.79: Medium; 0.80 or higher: Large.

Shown in Table 6 is the result of an independent samples t-test employed to determine the statistical difference between the post-test mean level performance of the experimental and

comparison groups. The experimental group's mean score was 16.67, which is higher than the comparison group's mean score of 14.50. This shows that in the post-test, the experimental group performed better and scored higher than the comparison group. In addition, with focus on the standard deviation, the scores of the experimental group are more clustered than the spread of the comparison group. Given the data in Table 4, it can be concluded that there was a significant difference between the post-test mean level performance of the experimental and comparison group conditions [$t(58) = 3.606$, Mean-Diff = 2.167, p -value < 0.01].

With a Cohen's d value of 0.933, it is shown that the effect size is large. This means that the intervention applied to the experimental group greatly affected their reading performance.

As the study employed the use of digital tools in teaching English and reading, the results of the study support the study of Wilson (2021), which claims that there is an increase in learners' engagement and level of performance as the teacher utilizes technology in teaching, particularly in relation to the SAMR approach. Furthermore, digital platforms in education may be introduced to improve the performance of learners (Benjamins, 2018).

The findings show that the Grade 3 pupils of Sampiruhan Elementary School who utilized the intervention course Digi-Tiles scored higher and performed better in reading comprehension tests after the utilization of the course. The difference of 2.17 in their mean scores shows that there was exhibited progress from the experimental group as compared to the comparison group.

Focusing on the experimental group's scores in their pretest and post-test, it can be noticed that there was significant progress, bearing a 3.07 difference in their mean scores. This means that after the completion of the course, their reading performance significantly improved. The effect size being large further confirms that the findings of the research have actual practical significance.

The findings confirm that there was a significant difference in the mean scores of the comparison group in their pretest and post-test. However, given the small effect size with a Cohen's d value of 0.381, it can be concluded that within the span of time that the pretest and post-test have been administered, their reading performance was only slightly developed.

The results of the post-test of both the experimental and comparison groups showed that there was a significant difference. The mean score of the experimental group is higher than the comparison group. This shows that the group that utilized the Digi-TILES intervention made significant progress in their reading comprehension.

CONCLUSIONS

The experimental group performed reading comprehension tests better in their pre-test and post-test compared to the comparison group. Grade 3 pupils who utilized the intervention course Digi-Tiles scored higher and performed better in reading comprehension tests after using the course. The Digi-TILES intervention made significant progress in their reading comprehension.

REFERENCES

- Acosta, M. (2016). Paradigm Shift in Open Education and E-Learning Resources as Teaching and Learning in Philippines. *Jurnal Ilmiah Peuradeun*, 4(2), 161-172. <https://doi.org/10.26811/peuradeun.v4i2.94>
- Arulchelvan, P., Veramuthu, P., Singh, P. K. P., & Yunus, M. M. (2019). iGen Digital Learners: Let's Collaborate via Coggle. *Creative Education*, 10(01), 178. <https://doi.org/10.4236/ce.2019.101014>
- Bazeley, J. W., & Shrimplin, A. (2014). The Value of Purchasing E-Books From a Large Publisher: A Usage-based Analysis of Oxford University Press E-Books. Retrieved from https://sc.lib.miamioh.edu/bitstream/handle/2374.MIA/5123/valueebksoxford_timberline2012_pres.pdf?sequence=1
- Carter, T. (2018). Preparing Generation Z for the teaching profession. *SRATE Journal*, 27(1), 1-8.

- Retrieved from <https://files.eric.ed.gov/fulltext/EJ1166694.pdf>
- Cilliers, E. J. (2017). The challenge of teaching generation Z. *PEOPLE: International Journal of Social Sciences*, 3(1). Retrieved from <https://opus.lib.uts.edu.au/bitstream/10453/158991/2/PSV311188198.pdf>
- Confait, S. (2015). Beginning teachers' challenges in their pursuit of effective teaching practices. *Cogent Education*, 2(1), 991179. <https://doi.org/10.1080/2331186X.2014.991179>
- Dare, E. A., Ellis, J. A., & Roehrig, G. H. (2014). Driven by beliefs: Understanding challenges physical science teachers face when integrating engineering and physics. *Journal of Pre-College Engineering Education Research (J-PEER)*, 4(2), 5. <https://doi.org/10.7771/2157-9288.1098>
- Darling-Hammond, L. (2015). Want to close the achievement gap? Close the teaching gap. *American Educator*, 38(4), 14-18. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1049111.pdf>
- DiPerna, J. C., Lei, P., Bellinger, J., & Cheng, W. (2015). Efficacy of the Social Skills Improvement System Classwide Intervention Program (SSIS-CIP) primary version. *School Psychology Quarterly*, 30(1), 123. <https://psycnet.apa.org/doi/10.1037/spq0000079>
- Flower, A., McKenna, J. W., Bunuan, R. L., Muething, C. S., & Vega Jr, R. (2014). Effects of the Good Behavior Game on challenging behaviors in school settings. *Review of educational research*, 84(4), 546-571. <https://doi.org/10.3102/0034654314536781>
- Gaikhors, L., Beishuizen, J., Roosenboom, B., & Volman, M. (2017). The challenges of beginning teachers in urban primary schools. *European Journal of Teacher Education*, 40(1), 46-61. <https://doi.org/10.1080/02619768.2016.1251900>
- Gillispie, V. (2016). Using the flipped classroom to bridge the gap to generation Y. *Ochsner Journal*, 16(1), 32-36. Retrieved from: http://www.ochsnerjournal.org/content/16/1/32?utm_source=TrendMD&utm_medium=cpc&utm_campaign=Ochsner_Journal_TrendMD_0
- Hill, T. R., Doyle, M., Kocsis, D., Sessions, R., & Jackson, R. (2017). Inroads to Engaging iGeneration Students in Innovative IS Education: Lessons Learned in the Trenches. Retrieved from https://www.researchgate.net/profile/Timothy-Hill-10/publication/317266975_Inroads_to_Engaging_iGeneration_Students_in_Innovative_IS_Education_Lessons_Learned_in_the_Trenches/links/592f0537a6fdcc89e7733985/Inroads-to-Engaging-iGeneration-Students-in-Innovative-IS-Education-Lessons-Learned-in-the-Trenches.pdf
- Izzah, L., Hadi, M. S., & Ab Rahman, N. F. Engaging Learners with the Internet of Things (IoT): Gen Z's Perspectives. In *PROCEEDINGS OF EDUCATIONAL INITIATIVES RESEARCH COLLOQUIUM 2019* (p. 150). Retrieved from https://www.researchgate.net/profile/Mohd_Asnorhisham_Adam2/publication/334277488_INTERNATIONAL_SOCIETY_FOR_EDUCATIONAL_INITIATIVES_ISEI/links/5d20b3f092851cf4406c0868/INTERNATIONAL-SOCIETY-FOR-EDUCATIONAL-INITIATIVES-ISEI.pdf#page=158
- Jansen, C., & van der Merwe, P. (2015). Teaching Practice in the 21st Century: Emerging Trends, Challenges and Opportunities. *Universal Journal of Educational Research*, 3(3), 190-199. Retrieved from <https://eric.ed.gov/?id=EJ1056080>
- Kee, C. N. L., & Samsudin, Z. (2014). Mobile Devices: Toys or Learning Tools for the 21st Century Teenagers?. *Turkish Online Journal of Educational Technology-TOJET*, 13(3), 107-122. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1034238.pdf>
- Khan, A., Fleva, E., & Qazi, T. (2015). Role of self-esteem and general self-efficacy in teachers' efficacy in primary schools. *Psychology*, 6(01), 117. <http://dx.doi.org/10.4236/psych.2015.61010>
- Koulopoulos, T., & Keldsen, D. (2016). *Gen Z effect: The six forces shaping the future of business*. Routledge. <https://doi.org/10.4324/9781315230337>
- Lisenbee, P. (2016). Generation gap between students' needs and teachers' use of technology in classrooms. Retrieved from <https://twu-ir.tdl.org/handle/11274/12172>
- Lyons, S., Urick, M., Kuron, L., & Schweitzer, L. (2015). Generational differences in the workplace: There is complexity beyond the stereotypes. *Industrial and Organizational Psychology*, 8(3),

- 346-356. <https://doi.org/10.1017/iop.2015.48>
- Metto, E., & Makewa, L. N. (2014). Learner-centered teaching: Can it work in Kenyan public primary schools. *American Journal of Educational Research*, 2(11A), 23-29. <https://doi.org/10.12691/education-2-11A-4>
- Nagy, Á., & Kolcsey, A. (2017). Generation Alpha: Marketing or Science. *Acta Technologica Dubnicae*, 7(1), 107-115. <https://doi.org/10.1515/atd-2017-0007>
- Ntumi, S. (2016). Challenges Pre-School Teachers Face in the Implementation of the Early Childhood Curriculum in the Cape Coast Metropolis. *Journal of Education and Practice*, 7(1), 54-62. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1089727.pdf>
- Olgan, R. (2015). Influences on Turkish early childhood teachers' science teaching practices and the science content covered in the early years. *Early Child Development and Care*, 185(6), 926-942. <https://doi.org/10.1080/03004430.2014.967689>
- Osiceanu, M. E. (2015). Psychological implications of modern technologies: "technofobia" versus "technophilia". *Procedia-Social and Behavioral Sciences*, 180, 1137-1144. <https://doi.org/10.1016/j.sbspro.2015.02.229>
- Okiridu, O. S. F., & Ogwunte, P. C. (2018). Issues and Trends in the Application of E-learning Technologies in Teaching Business Education in Universities in Niger Delta. *National Association of Business Educators of Nigeria*, 5(1), 134-141. <https://doi.org/10.9734/ajess/2020/v6i130166>
- Ozkan, M., & Solmaz, B. (2015). The changing face of the employees-generation Z and their perceptions of work (a study applied to university students). *Procedia Economics and Finance*, 26, 476-483. [https://doi.org/10.1016/S2212-5671\(15\)00876-X](https://doi.org/10.1016/S2212-5671(15)00876-X)
- Philomina, M. J., & Amutha, S. (2016). Information and communication technology awareness among teacher educators. *International Journal of Information and Education Technology*, 6(8), 603-606. <https://doi.org/10.7763/IJJET.2016.V6.759>
- Rajabion, L. (2018). Generation Z students: Will they change our computer science and IT classrooms. *Systemics, Cybernetics and Informatics*, 16(4), 8-12. Retrieved from <https://pdfs.semanticscholar.org/7c93/512f59026f97c28660c0467e90f7f5e56282.pdf>
- Ramos, M. (2019). Back to School for 27.2 Million Students; DepEd Vows Improvements. Retrieved from <https://newsinfo.inquirer.net/1126063/back-to-school-for-27-2-million-students-deped-vows-improvements>
- Rothman, D. (2016). A Tsunami of learners called Generation Z. URL: http://www.mdle.net/JoumaFA_Tsunami_of_Learners_Called_Generation_Z.pdf. Retrieved from https://mdle.net/Journal/A_Tsunami_of_Learners_Called_Generation_Z.pdf
- Seemiller, C., & Grace, M. (2017). Generation Z: Educating and engaging the next generation of students. *About Campus*, 22(3), 21-26. <https://doi.org/10.1002/abc.21293>
- Sladek, S., & Grabinger, A. (2014). Gen Z. *Introducing the first Generation of the 21st Century Available at https://goo.gl/lu5o2t [accessed December 2016]*. Retrieved from https://www.xyzuniversity.com/wp-content/uploads/2018/08/GenZ_Final-dl1.pdf
- Sullivan, A. M., Johnson, B., Owens, L., & Conway, R. (2014). Punish them or engage them? Teachers' views of unproductive student behaviours in the classroom. *Australian Journal of Teacher Education*, 39(6). <https://search.informit.org/doi/10.3316/jelapa.479156672510478>
- Swanzen, R. (2018). Facing the generation chasm: the parenting and teaching of generations Y and Z. *International Journal of Child, Youth and Family Studies*, 9(2), 125-150. <https://doi.org/10.18357/ijcyfs92201818216>
- Taleb, Z., Ahmadi, A., & Musavi, M. (2015). The effect of m-learning on mathematics learning. *Procedia-Social and Behavioral Sciences*, 171, 83-89. <https://doi.org/10.1016/j.sbspro.2015.01.092>
- Torocsik, M., Szucs, K., & Kehl, D. (2014). How generations think: research on generation z. *Acta universitatis Sapientiae, communicatio*, 1(1), 23-45. Retrieved from <http://grupespsichoterapija.lt/wp-content/uploads/2017/09/comm1-3.pdf>
- Trussell, R. P., Lewis, T. J., & Raynor, C. (2016). The impact of universal teacher practices and function-based behavior interventions on the rates of problem behaviors among at-risk students. *Education and Treatment of Children*, 39(3), 261-282. <https://doi.org/10.1353/etc.2016.0012>

Tung, L. C., & Comeau, J. D. (2014). Demographic Transformation in Defining Malaysian Generations: The Seekers (Pencari), The Builders (Pembina), The Developers (Pemaju), and Generation Z (Generasi Z). *International Journal of Academic Research in Business and Social Sciences*, 4(4),383. <http://dx.doi.org/10.6007/IJARBS/v4-i4/809>