Game-Based Learning Material for Developing Reading Comprehension

Karen Mae B. Bondaug
Department of Education - Ozamiz City Division
ORCID No. 0000-0002-5874-5211

Abstract

To address the deteriorating reading proficiency of learners in the entire country, the Department of Education strengthened the reading programs in schools. Teachers were urged to create projects and materials to aid this advocacy. Given this, the present study developed instructional material for Grade 8 learners to enhance their reading comprehension. Using the modified three-stage instructional development model of Seels and Glasgow (1998), the researcher developed a research-based instructional material integrating the principles of game-based learning. The game-based instructional material focused on developing specific competencies identified as the least mastered skills of the learners. The material was evaluated by a panel of experts, the teacher-users, and the learner-users. This was then implemented to target users to determine the material's effectiveness in developing the target competencies. The pretest and posttest results yielded a significant difference in both the try-out and implementation stage signifying that the material was effective in increasing the reading comprehension level of the learners. Moreover, positive feedback was also gathered from both the teacher-users and the learners. The material was also found to increase the learners' interest and engagement in their reading class.

Keywords: Game-based learning, instructional material, games, digital games, task-based games

Introduction

With the advent of digital technology and social media, learners are more engaged in reading than before. Their source of knowledge and information is no longer limited to the four walls of the classroom. However, despite being a basic skill, learners seemed to have misunderstood reading. Many think that reading is simply recognizing symbols and decoding words (Thiede & de Bruin, 2018). Contrary to this misconception, reading involves a complex cognitive process. More than the ability to decode symbols, the key purpose of reading is comprehension. Among other things, reading comprehension is what many learners of this generation lack. Essentially, without the capacity to understand the text they are reading, it is expected that the learners' reading proficiency would be below average. In most cases, because of poor reading comprehension, most learners are not performing well in school.

Without a doubt, the ability to comprehend written texts is vital in one's growth and progress. Therefore, the deteriorating reading proficiency of learners in the entire country has become the primary concern in the Philippine education system, especially since the release of the 2018 Programme for International Student Assessment (PISA) results. As shown in the results, the Philippines ranked among the lowest in Math, Science, and Reading. In fact, among 79 countries that participated in the said assessment, the Philippines ranked

last in reading comprehension (PISA, 2018). Educators and administrators in the academic institutions considered this phenomenon a wake-up call to all. Because up until recently, many of the programs in reading have discontinued, while a few remaining have been given less importance. In addition, while the learners are becoming more and more diverse, many teachers still use the conventional teaching methods. This leads learners to lose interest in the classroom.

Many learners fail to reach their full potential due to poor reading comprehension. Educators are acutely aware of a strong link between reading competency and academic performance across the curriculum. Consequently, it is not surprising that, along with reading, the Philippines is also at the bottom ranks in science and math, respectively (PISA, 2018). It is therefore, essential to address first the growing concerns on learners' poor reading comprehension before one can expect any changes in the learners' performance in other subjects.

In this era of technological revolution, learners are living in an intensely stimulating period where they are besieged with information from every platform- cellphones, computers, televisions, etc. All of these distract learners from developing an interest in reading. Furthermore, the increasing number of social media sites and online applications consumes most of the learners' time; this then leads to a decrease in doing academic tasks that primarily requires reading and comprehension, and thereby weakening their academic performance. However, if there is a way to transform this seemingly distracting technology to the teachers' advantage, they should take the challenge.

Engaging the learners at the beginning of the lesson is a key factor in the achievement of the learning goals; however, the teachers are not limited to this alone, other contributing factor are also considered. Given the situation, a shift is currently developing within the education system. Thousands of teachers worldwide adapt technology-related approaches to teaching reading. Most of them look for ways to motivate the learners to enjoy the reading activities and enrich their experiences and engagement while developing skills essential to thrive in the modern age.

One pedagogical technique that piqued the interest of many educators is the use of games in learning, especially digital and online games. In hindsight, the use of games in the classroom is by no means a new trend. However, many teachers claim that it is not very effective in developing specific skills. According to Becker (2007), this can be explained by the lack of knowledge and training of using games in learning. Fortunately, in recent years, many educational researchers and theorists (Gee, Squire, Lepper, Shaffer, etc.) did considerable researches in the use of learning games (Denham, Mayben, & Boman, 2016). Game-based learning (GBL) is a result of these tireless efforts. Through GBL, the integration of games in the classroom has become easier and more meaningful.

The integration of game-based learning in the classroom offers a more engaging and motivating alternative to the traditional learning environment (Klimova, 2014). Reading teachers can take advantage of these affordances to develop specific skills in reading. GBL involves various types of games that help develop learners' vocabulary, reading interest, and eventually reading comprehension while allowing them to enjoy the learning experience. Because of the engaging nature of games, learners' participation and reading interests can increase (Ware, 2012).

For many years, the efforts of many reading teachers on developing learners' reading skills have become an incidental outcome rather than an intended outcome. To further address this issue, several programs, projects, and activities on developing the reading skills of the learners have already been introduced, implemented, and used in schools. The thrust

of the Department of Education to improve the quality of learners' reading abilities have given rise to different programs and projects such as the *Every Child is a Reader Program* (ECARP), National Reading Month, *Drop Everything and Read* (DEAR), *Summer Reading Camp,* and the *Care for NorMin Readers*. These programs and projects are designed to develop the reading abilities of learners in the public schools and equip them to cope with the demands in school and life in general.

However, despite the efforts of the Department of Education to elevate the quality of readers in the public-school system, it still fell short, according to recent studies. In 2017, a non-profit organization, Synergeia Foundation, surveyed learners, and the result revealed that 53% of the learners were "frustration" readers. This is then confirmed by the Philippines' 2018 PISA results. Overall in Reading Literacy the Philippines only got 340 points. This number is significantly lower than the OECD (Organisation for Economic Co-operation and Development) average of 487 points. The score implies that 1 out of 5 learners are at least at the minimum proficiency level in Overall Reading Literacy (PISA, 2018).

Over the last few years, numerous studies have been conducted to address the poor reading comprehension of learners, and most of these studies employ different reading strategies, like the use of games. Recently, there has been a growing interest in the use of Game-based Learning to develop specific skills and improve learners' engagement in the classroom. In a study conducted by Gozcu and Caganaga (2016) on the importance of using games in English as a Foreign Language (EFL) classrooms, findings revealed that games create a fun and satisfying environment while learners' motivation for learning is heightened. This was also documented by Klimova (2014) in a previous study as she presented the classifications, benefits, and proper ways of using games in the classroom.

Game-based learning (GBL) has been in the education system for years, and it has gone through several changes and development as teaching and learning becomes so varied and the learners diverse. In light of the different studies which support and negate the others, this study presents a solution while taking into consideration the strengths and weaknesses of the different types of games. This study developed are instructional material utilizing both digital and non-digital games. Following the principles and elements of GBL, the instructional material includes games designed to develop specific competencies in reading comprehension. The games presented in this study are original, while some are inspired by existing online games.

In the last three years, the poor reading comprehension of learners of a local national high school has been a recurring problem. The scarcity of reading materials is seen as one of the major factors affecting their poor reading interest. Although several interventions have already been implemented, the problem persists. Moreover, this problem is not just an isolated issue. Schools in the division and even in the entire Region X share the same dilemma. Even recently, the region had floated R.M. 243, s. 2019 entitled "Implementation of Project CNR (ROX READING PROGRAM) to intensify the implementation of reading interventions in the entire region. The overarching goal of this project is to make every elementary and high school learner an independent reader in the Mother Tongue, Filipino and English.

Hence, this study targetted the development of reading comprehension of the learners in a public secondary school by developing instructional material integrating game-based learning in the teaching-learning process. Through this 21st-century teaching style, the learners should have an increase in their reading performance at the end of the study. Moreover, since tasks and activities in textbooks are very limited, this material serves as additional resource material for reading teachers and for

those who wish to employ GBL in their lessons.

Framework of the Study

The development of the game-based instructional material to enhance learners' reading comprehension skills hinges on the schema theory of Rumelhart (1978) and the concepts on reading comprehension and game-based learning.

Schema theory is an important aspect of cognitive science. It is a theory that describes how knowledge is acquired, processed, and retrieved. Schemas or schemata are cognitive constructs used to organize information in the long-term memory (Widdowson, 1983). Schemata are very useful in reading because they allow readers to take shortcuts in interpreting the vast amount of information available in the environment. In his theory, Rumelhart (1978) explained how readers use prior knowledge to comprehend and learn from text. The contention of this theory is that the prior knowledge or background information of the learner plays a vital role in their understanding and learning. It highlights the important role of background knowledge and how learners use schemata in understanding the text they are reading.

Rumelhalt (1980), Carell (1981), and Hudson (1982) introduced schema in reading while discussing the important role of background knowledge in reading comprehension. Schema theory in reading suggests that when reading a text where the topic and situation are familiar to the reader, comprehension will transpire. Pankin (2013) maintained that past experiences could be accessed to guide current understanding or actions. When reading, the organized unit of knowledge or schema that readers have on that subject helps them form a certain kind of understanding. He also added that one significant characteristic of schemas is that they are dynamic. This means that they can develop and change depending on the new information and experiences individuals accumulate along the way. Thereby it supports the notion of plasticity in development. Schemas can change and are improved over time and with experience.

Most of the learners' comprehension is likely the same. Therefore, it is important to recognize that learners' understanding of content is drawn from their prior experiences, also known as "schema." An (2013) explained that the fundamental principle of the schema theory is that it assumes that written text does not carry meaning by itself; rather, the text provides directions for readers on how they should retrieve or create meaning from their own previously acquired knowledge. Based on previous studies, this background knowledge can be activated. According to Li (as cited in An, 2013), schema activation is the process of tipping some textual stimuli to signal the area or direction for the reader to look into and evoke relevant memories into the present reading task. Some words or group of words that can signal certain schema are very helpful to the reader who is trying to grasp the meaning of a particular text. As teachers, one aspect of learning that should be considered, is how learners use background knowledge to comprehend and learn from the text. Hence, this schema theory has guided the researcher in choosing reading materials that are appropriate and relatable to the target participants.

The first concept on which the present study is also anchored is reading comprehension. Vacca and Vacca (1989) defined reading comprehension as the measure of success for reading; it is the act of exploring and making meaning. To facilitate comprehension, Vacca and Vacca imposed structure on text. Learners who can recognize relationships among concepts and propositions are better able to respond to meaning and distinguish important from less important ideas. In fact, without the ability to invoke meaning through the transaction between the reader and the writer, reading cannot occur. Comprehension skills are highly interactive and cannot be separated and taught as single discrete skills. To make

sense of reading, readers work with print by making use of their background knowledge, as well as their expectations for written language. By matching what the reader already knows about the text, readers achieve comprehension (Vacca & Vacca, 1989). This study used games as the channel for learners' prior knowledge to be activated or with games they are introduced to the context of the reading selection.

Lee (2019) calls attention to the fact that reading is a complex process and that it requires many different skills to achieve the ultimate purpose of reading which is comprehension. It is therefore important that educators identify these skills to better assist the learners in the process of developing their reading comprehension skills. He pointed out that there are six (6) essential skills the learners need to master to fully comprehend the reading text. The six essential skills are the following: decoding, fluency, vocabulary, sentence construction and cohesion, reasoning and background knowledge, and finally, working memory and attention.

On another note, Robinson and Good (1987) claimed that comprehension is divided into three different levels: literal level, inferential level, and critical or evaluation level. These levels involve different skills, which range from easily acquired skills to the most difficult ones. Seymour (2017) also added that most learners have different comprehension levels. Ideally, readers who can comprehend texts on a critical or evaluation level are better than those who can only understand on the literal level. However, all these levels of comprehension are important. As emphasized by various researchers (Clarke & Silberstein, 1979; Greenwood, 1981; Grellet, 1987), there are four types or purposes of reading: skimming, scanning, intensive reading, and critical reading. Hence, the different levels of comprehension are important and useful depending on the type or purpose of reading.

Another anchorage of this study that has stirred the field of education in recent years is game-based learning. Most definitions of game-based learning emphasize that it is a type of gameplay with defined learning outcomes (Shaffer, Halverson, Squire, & Gee, 2005). Game-based learning is built upon a constructivist type of learning that posits that there is a need to provide learners with the necessary tools so they can build their procedures and solve a problem. This implies that a participatory process is required from the learners: which is to interact with their environment and to solve the situation that is being set out for them.

Games have transformed the traditional classroom into a motivating and engaging learning environment. Since the exploration of play and games by Piaget (1962) and Vygotsky (1978), games in teaching and learning have increased significantly. According to Malone (1980), the key behind their success in teaching without teaching is the game's ability to create an intrinsic factor of motivation. In the educational context it introduces two types of games, digital and non-digital games. Von Gillern and Alaswad (2016) emphasized that both digital (computer and online games) and non-digital (physical or use of manipulatives) games are very useful in promoting engagement and learning. They claimed that when used appropriately, game-based learning can provide both the teachers and learners a long list of advantages.

In integrating GBL, several researchers introduced different types of games available for use. Among them, Lewis and Bedson (1999) and Hadfiled (1998) presented a more comprehensive and inclusive classification of games in which all other classifications can be combined. Accordingly, the different types of games are movement games, task-based games and computer/digital games. Movement games are the kind of games where learners must be physically active; they may be asked to run, jump, or walk. Task-based games, on the other hand, are usually a pair or group work and those that require learners to do specific and meaningful tasks. Lastly, a popular type these days is computer games; learners can

play anytime and anywhere with the use of computers or any hand-held devices. It can also be an offline or an online computer/digital game. In making the material, the researcher adopted this classification.

The instructional material developed was framed based on the features and elements of game-based learning. Plass et al. (2015) presented the different features of game-based learning: motivation, player engagement, adaptivity, and graceful failure are the salient features of GBL that make it effective in learning environments.

In the present study, the game-based instructional material for developing reading comprehension was designed based on the above mentioned theory and concepts. The schema theory and the principles, features, and elements of game-based learning and reading comprehension guided the researcher in developing the instructional material. The propositions of the schema theory was taken into consideration in the creation and development of the instructional material, especially in the selection of the reading materials. In the same way, game-based learning and reading comprehension were the key features in producing the instructional material. It specifically included games that are contemporary and appropriate to the levels of the target participants. The tasks in the games were based on the target competencies on reading comprehension.

Statement of Purpose

The primary objective of this study is to construct, validate and test the effectiveness of the instructional material on developing the reading comprehension skills of Grade 8 learners.

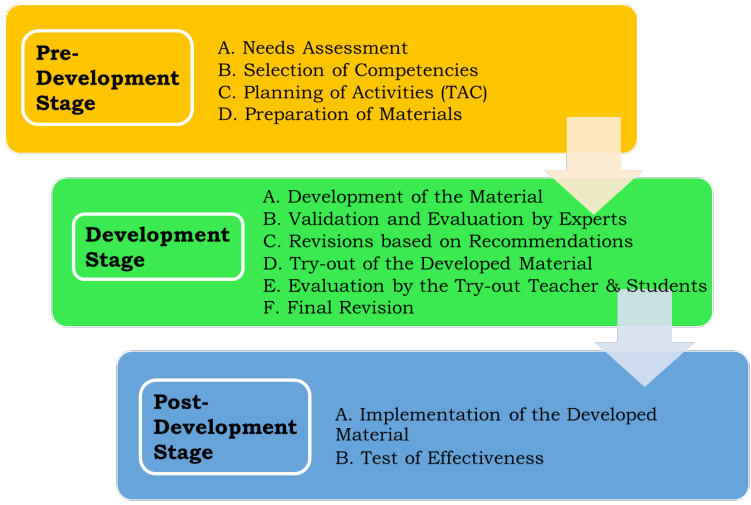
Specifically, it seeks to:

1. construct an instructional material on developing reading comprehension skills using game-based learning;
2. validate the material by subjecting it for evaluation by the panel of experts and pilot testing it to the try-out teacher and learners;
3. revise the material based on the suggestions and recommendations of the panel of experts, try-out teacher and learners; and
4. test the effectiveness of the developed, validated, and revised instructional material in developing reading comprehension skills.

Methodology

This study adopted the instructional development (ID) design that involves the development, validation, revision, and the test of the effectiveness of the constructed instructional material in enhancing learners' reading comprehension through game-based learning. The participants were learners from a public secondary school, with an approximate population of 640 students and 33 faculty and staff. The participants were chosen through a purposive sampling method. The target participants of the study involved 40 learners who were taking English 8 in the school year, 2019-2020.

The researcher utilized and modified the three-stage model of Seels and Glasgow (1998) in the preparation and use of the instructional material. The stages are pre-development, development, and post development. In the pre-development stage, the researcher conducted a needs assessment and selection of competencies, designed a task analysis chart, and prepared the planning and design of the material. The development stage involved the construction of the material, evaluation and validation by the experts, revision of the material based on the experts' recommendations, try-out of the materials, and then the final revision. Lastly, during the post-development stage, the implementation of the validated material and the test of effectiveness were conducted.



Frame 2. Flow chart of the three (3) stages of the IMD model.

The achievement test used to assess the effectiveness of the developed and validated material was adopted from the PHIL-IRI Manual. This was validated by experts and piloted before the administration of the test. During the implementation of the material, pre and post- tests were conducted to the learner-users. The scores in the said tests were then compared to determine if there was a significant increase

Research Procedure

This study followed the three stages of the instructional materials development (IMD) model adopted from Seels and Glasgow (1998) with modification based on the need of the study.

Frame 2 presents the specific steps undertaken by the researcher in the development of the material.

Test of Effectiveness

To determine the effectiveness of the developed and validated material, a one-group pretest and posttest design was used. The validated achievement test from the PHIL IRI Manual was utilized in the test of effectiveness. The test was administered before and after the implementation of the developed material. Statistical treatments were employed to determine the effectiveness of the material. The test results during the pretest and posttest were compared and analyzed to assess whether or not there is a significant difference in the performance of the learners.

Treatment of Data

In this study, descriptive statistics were used in the revision and finalization of the instructional material. The revisions were based on the evaluation of the experts, try-out teacher, and learners. The mean rating of the evaluation sheets was obtained to determine the validity of the instructional material. Statistical treatments such as the mean, standard deviation, and p-value were used to determine the effectiveness of the instructional material in developing the reading comprehension of the learners. The result of the paired t-test was used to determine if there was a significant difference in the learners' performance based on the pre-test and post-test results.

Results and Discussion

Table 1 presents the results of the needs assessment using a diagnostic test. Shown in table are the top 20 items from the diagnostic test with the lowest means. These items were grouped according to comprehension levels and their specific competencies.

Table 1
Least Mastered Competencies Based on the Diagnostic Test Result

Competencies	*Items*
LITERAL	
Locating and Collecting Information	40, 41, 48, 56
INFERENTIAL	
Comprehending Implied Meaning	24, 42, 49
Making Inferences	37, 45, 50, 57, 58
Drawing Conclusions	15, 30, 38
CRITICAL	
Identifying the Main idea	33, 34, 53, 59, 60
Total Items	20

As can be gleaned from Table 1, the top 20 items with the lowest means as identified were five (5) reading comprehension competencies. In selecting competencies, the researcher narrowed down the identified least mastered competencies into four (4) competencies through an informal interview with the teachers teaching the subject in the identified grade level. The teachers mentioned that based on their personal experiences, most learners had difficulties with the competencies under the inferential and critical level. Since it would also be too difficult to develop multiple competencies at once, the researcher, as per experts' suggestions, limited the target competencies into four. It was also suggested by a related study that learning materials should focus on the competencies most learners have difficulty in (Moore, 2014). Therefore, the least mastered competencies are determining meanings using context clues, making inferences, drawing conclusions, and identifying main ideas. These competencies were arranged from easy to difficult, as well as based on which competencies must be mastered first before learning another skill.

Following the needs assessment was the development of the instructional material as well as the validation and evaluation of experts, revisions based on the recommendations of the experts, tryout of the developed material, and final revision.

The three groups of evaluators, a panel of experts, the try-out teacher, and the try-out learners, validated the developed instructional material. They examined and rated the content of the materials based on a set of criteria. They also gave their feedback, suggestions, and recommendations. The researcher carefully considered them in the revision of the material. There were three experts in the academe recommended to examine the developed instructional material. They evaluated the material based on the following criteria: content and content accuracy, clarity, and appropriateness. The experts rated the specific features and characteristics of the instructional material under each of the criteria with the following: *strongly agree, agree, disagree, and strongly disagree*. The indicators with the lowest rating and the comments and suggestions served as the basis for improvement of the material.

Try-Out

To further validate the instructional material, it was tried out in another public secondary school. After the try-out of the instructional material, the try-out teacher evaluated the games based on content and content accuracy, usability and functionality,

and appropriateness. Each of these indicators was rated with the following responses: *strongly agree, agree, disagree, and strongly disagree.* There were also questions indicated at the end of the opinionnaire for the qualitative data.

Based on the rating of the try-out teacher, no modification or revision was needed. However, the qualitative data gathered from the opinionnaire and the comments of the try-out teacher during the try-out of the material were given much consideration for the refinement of the material.

The results can be attributed to the material being specifically designed to engage the learners in the learning process through games. This observation is supported by several studies (Boyle, 2011; Dennis, 2016; Gillern & Alaswad, 2016). Since many learners find reading tedious, the material allowed the reading activity to be more meaningful and engaging. This then deflected the learners from the actual reading activity. The results also confirmed the finding of Gozcu and Caganaga (2016) that games create a fun and satisfying environment as well as enabling learners to have high motivation for learning.

Since games are a natural part of children's development (Klimova, 2014), there is high hope that the game-based instructional material will catch the attention and even solicit participation from the learners. Furthermore, the observation of the teacher-user about cooperation being evident in the classroom strengthened the claim of a similar study conducted in India. Ghazal and Singh (2016) enumerated several advantages of integrating game-based learning in a language classroom, and one of them is that games instill empathy and social skills among learners. To accomplish tasks, players spontaneously collaborate with other players. Bataineh (2011) also added that playing improved the learners' social relationships.

During the try-out of the material, it was evident that the learners had fun while playing the game. With the strict rules implemented on rotation, team members were able to participate and contribute to the game. Because they were so immersed in the game, even learners with low social skills shared their thoughts and answers. This implies that when learners are engaged in the learning activity, there will be no room left for doubt or insecurity. Everyone shares his/her thoughts and ideas, and there is no one dominating the group; everyone's opinion mattered. This is further supported by the result in the learners' opinionnaire.

Once the final revisions were done, and the improved material was produced, the researcher implemented the developed material to the target participants. Then the researcher administered a pretest and posttest to get the effectiveness of the instructional material.

Test of Effectiveness of the Instructional Material

The test of the effectiveness of the developed instructional material integrating game-based learning was done through a pretest and posttest. The scores of the learners in the test were compared using paired t-test. The comparison of the means determined whether there is a significant result in the performance of the learners. Before the implementation of the material, a 40-item pretest was administered. Once the implementation was complete, the same test was again administered and then subjected to statistical analysis.

Table 2 presents the mean scores of the target participants during the pretest and posttest. The means are the average scores of the learners in the pre-test and post-test. From the results of the paired t-test on the learners' scores, the result yielded a significant p-value. As can be ascertained from the table, there is an increase in the mean scores from the pre-test to the post- test. Based on the results of the p-value, it can be interpreted that there is a significant difference in the comparison of the mean scores. This significant difference is translated as an improvement in the reading comprehension of the participants. The increase

Table 2
Summary of Pretest and Posttest Results of the Target Participants

Test	M	SD	p-Value
Pretest	14.07	3.741	.049
Posttest	15.68	3.611	
Mean Difference	1.608		

Test of Comparison between Pretest and Posttest
**Significance at 0.05 level*

in participation and motivation of the learners in the lessons/games can be attributed as the reason for this change.

The results are in line with earlier studies which provided evidence of positive effects in the use of game-based learning in reading, including the development of other target skills or competencies (Bataineh, 2011; Papatga & Ersoy, 2016; Rominus et al., 2019; Toma et al., 2016). The current study corroborates these findings by demonstrating that game-based materials motivate the learners to participate, collaborate, and perform in the teaching and learning process. Since games are interactive and very engaging, learners are motivated to take part in the learning process. This type of engagement alone can predict a change in learning. But as to the extent of how much the learners can gain from the games, it will still depend on how well-developed the instructional materials are.

By offering a creative and engaging way of interacting with content, the players experience the pleasures of the game (Ke et al., 2015). This heightened involvement enabled the learners to develop their least mastered skills while enjoying the learning process. Likewise, the result of the present study is parallel to the results of the study conducted by Montano (2019). Montano utilized GBL intervention among struggling readers, and the results were significantly positive. Turning reading into a very fun and engaging activity developed the learners' interests in reading and later improved the skills they were unable to master previously. This study also emphasized the importance of developing a material that will help the learners develop their skills slowly but surely. Similarly, the current study provided ample time for the learners to learn and master the target skills. This is also seen as a contributing factor to the effectiveness of the material.

The favorable results can also be associated with the systematic development of the instructional material. Similar studies on instructional development conducted by Akut (2016), Ambrona (2011), and Torreon (2010) also generated significant results. Despite having different target competencies, these studies generally focused on developing instructional materials on reading and comprehension skills. As mentioned by Carlisle and Rice (2002), there are no specific strategies or models that are a definite way to develop comprehension skills. However, if teachers can provide strategies that can monitor or repair specific comprehension skills, the reading achievement of learners can improve. In addition, aside from well-designed instructional materials, the development and implementation of these materials, including the present study, went through a very long but noteworthy process. This process enabled the materials to be examined and scrutinized by experts in the field.

Among the different games implemented,

it was also observed that participation and collaboration were more evident in games where the participants used digital materials. Compared to the movement and task-based games, games with digital materials were seemingly more organized and less noisy. The findings of Aghlara and Tamjid (2011) and Huang and Huang (2015) supported the effectiveness of integrating digital materials in learning. Based on their research, most learners prefer digital games over non-digital games because computer games have become an important part of children's lives and culture. It is highly recommended that teachers take advantage of these advancements rather than fighting against them in this era of technological revolution (Dennis, 2016).

In addition, the researcher also noticed that although the pre-test/post-test results of the try-out and target participants both obtained significant differences, there was a higher mean difference from the try-out group (μ_difference: 2.540) than in the target participants (μ_difference: 1.607). One factor considered in this phenomenon was the level of competition present in the two groups. As discovered, the try-out group was observed to have more competition between and among the other learners than those of the target participants. As per experience, the try-out group displayed more curiosity on the points given in each game and paid more attention on the scoreboard. They kept track of their scores and made sure they got more scores in the succeeding games. This occurrence, however, was not very evident in the target participants. Although the target participants were still concerned with their "running scores," these scores were not seen as the driving force of the participants to engage more in the games. This shows that there was less competition in the target participants compared to the try-out group.

The divergence in the level of competition in the two groups can explain the distinction between the mean difference of the mean scores of the two groups. As highlighted in the study of Ke et al. (2015), learners who have high levels of competence achieve and perform better than those who are less competitive.

In spite of these claims, other studies found that establishing or pinpointing which specific feature or element of the game can the effectiveness be attributed to is difficult (Freitas, 2018; Vandercruysse et al., 2012). Vandercruysse et al. pointed out that many studies conducted on the use of games or game-based learning established only the effectiveness of games in general. No study has been conducted in determining what feature or element of the game ensured the effectiveness of these games. De Freitas (2018) also explained that this question on efficacy is uncertain because almost all studies conducted using games have used different game frameworks or designs. These studies further clarify that although the observation made by the researcher in this study is true, it may not necessarily be true to all studies.

Nonetheless, games develop a different level of immersion in the learners, which drives them to become more active in the learning process. Despite the questions and need for further studies to specify what makes games effective, there is no doubt that integration of games or GBL can increase learning (Boyle, 2011; Pho & Dinscore, 2015).

Furthermore, the present study revealed that by harnessing the power of well-designed games, teachers could achieve specific learning goals with highly motivated learners who avidly engage in the learning activities. The developed instructional material, which adhered to the principles of game-based learning, was found to not only engage the learner in the teaching-learning process but also developed and improved the reading comprehension skills of the target participants.

In summary, the researcher was able to accomplish all the objectives stated in this study. The first objective, which emphasized

the construction of game-based learning material was achieved by conducting a need assessment and in-depth research on games and game-based learning. The second objective was achieved through a thorough validation process which included a review of the learning material by a panel of experts and the conduct of a try-out before the actual implementation of the learning material to the target participants. After the validation process, the material was revised based on the suggestions and recommendations of the panel of experts, the try-out teacher, and learners. Finally, it was tested for its effectiveness. The test included a comparison of the pre-test and post-test, a teacher questionnaire, and a student opinionnaire. It was true that much more could be done to improve the learning material, but it was by far very effective and has served its purpose.

Conclusions and Recommendations

The effectiveness and validity of the developed instructional material for developing reading comprehension integrating the principles of game-based learning was established in this study. The results and findings of the study confirmed that students could improve their reading comprehension skills after playing the games. Qualitative data from the student-users further described how the instructional material motivated them to take part in their learning as well as enable them to use different comprehension skills to achieve a high level of understanding in the selections they read. Teacher-users also highlighted the increased participation of the students in their reading classes.

The researcher, therefore, recommends reinforcing the integration of game-based learning in the various lessons and reading programs of the school. Also, since the instructional material is not curriculum specific, the material can be utilized and implemented regardless of the year level and grading period. The features of the instructional material can also be enhanced further by adding more games to target comprehension skills. The developed and validated instructional material is also useful in the conduct of reading interventions. Furthermore, the principles and elements of game-based learning may be introduced to teachers from other curriculums (grade levels or subjects) to boost participation and learning in their respective classrooms. The impact of games, especially in this era of technological revolution is invaluable. Therefore, more game-based learning instructional materials should be designed, developed, and validated to improve and boost the learners' performance.

References

Aghlara, L., & Tamjid, N. H. (2011). The effect of digital games on Iranian children's vocabulary retention in foreign language acquisition. *Procedia - Social and Behavioral Sciences*, *29*, 552–560. https://doi.org/10.1016/j.sbspro.2011.11.275

Akut, K. (2016). *Developing reading competencies for the 21st century: An instructional material* (Unpublished Master's Thesis). Bukidnon State University, Malaybalay City, Philippines.

Ambrona, C. (2011). *Activities to develop critical reading skills* (Unpublished Master's Thesis). Bukidnon State University, Malaybalay City, Philippines.

An, S. (2013). Schema theory in reading. *Theory and Practice in Language Studies*, *3*(1). https://doi.org/10.4304/tpls.3.1.130-134

Bataineh, A. M. (2011). *The effect of using web-site games on Saudi pupils' reading comprehension, vocabulary acquisition, and motivation*. https://pdfs.semanticscholar.org/2804/034b4e43dcb7ec6a14c74edb34ec2640f9b7.pdf

Becker, K. (2007). Digital game-based learning once removed: Teaching teachers. *British Journal of Educational Technology*, *38*(3),

478–488. https://doi.org/10.1111/j.1467-8535.2007.00711.x

Boyle, S. (2011). Teaching toolkit: An introduction to games based learning. UCD Dublin, Ireland: UCD Teaching and Learning/ Resources. Retrieved from https://www.ucd.ie/t4cms/UCDTLT0044.pdf.pdf

Carlisle, J. F., & Rice, M. S. (2002). *Improving reading comprehension: Research-based principles and practices*. York Pr.

Carrell, P. L. (1981). Culture-specific schemata in L2 comprehension, Selected Papers from the Ninth Illinois TESOL/BE Annual Convention, the First Midwest TESOL Conference, ed. by R. Orem & J. Haskell, Illinois TESOL/BE, Chicago. pp. 123-132.

Clarke, M., & Silberstein, S. (1979). Toward a realization of psycholinguistic principles in the ESL reading class. In *Reading Second Language*. (Ed.) Ronald Mackay, Bruce Barkman and R. R. Jordan. Rowley, Massachusetts: Newbury House. pp. 48-65

de Freitas, S. (2018). *Are games effective learning tools? A review of educational games*. Undefined. https://www.semanticscholar.org/paper/Are-Games-Effective-Learning-Tools-A-Review-of-Freitas/8565e3b0a465bfafa75bdc29e5f9cc7e8df17513

Denham, A. R., Mayben, R., & Boman, T. (2016). Integrating game-based learning initiative: Increasing the usage of game-based learning within K-12 classrooms through professional learning groups. *TechTrends*, *60*(1), 70–76. https://doi.org/10.1007/s11528-015-0019-y

Dennis, R. (2016, March). *Hooked on games: A guide to game-based learning*. MinegageEdu.

Ghazal, S., & Singh, S. (2016). *Game-based learning: Activities for ESL classes with limited access to technology*. ELT Voices -India.https://www.researchgate.net/publication/307885410_Game-Based_Language_Learning_Activities_for_ESL_Classes_with_Limited_Access_to_Technology

Gozcu, E., & Caganaga, C. K. (2016). The importance of using games in EFL classrooms. *Cypriot Journal of Educational Sciences*, *11*(3), 126. https://doi.org/10.18844/cjes.v11i3.625

Greenwood, M.R. (1981), Editorial. J. Appl. Toxicol., 1: 1-1. https://doi.org/10.1002/jat.2550010102

Grellet, F. (1981). *Developing reading skills: A practical guide to reading comprehension exercises. (1st ed.)*. Cambridge: Cambridge University Press, (chapter 1).

Hadfield, J. (1999). *Beginners' Communication Games*. London: Longman

Huang, Y.-M., & Huang, Y.-M. (2015). A scaffolding strategy to develop handheld sensor-based vocabulary games for improving learners' learning motivation and performance. *Educational Technology Research and Development*, *63*(5), 691–708. https://doi.org/10.1007/s11423-015-9382-9

Hudson, T. (1982). The effects of induced schemata on the "Short Circuit" in L2 reading: Non-decoding factors in L2 reading performance. *Language Learning*, 32, 1-33. http://dx.doi.org/10.1111/j.1467-1770.1982.tb00516.x

Ke, F., Xie, K., & Xie, Y. (2015). Game-based learning engagement: A theory- and data-driven exploration. *British Journal of Educational Technology*, *47*(6), 1183–1201. https://doi.org/10.1111/bjet.12314

Klimova, B. F. (2015). Games in the teaching of English. *Procedia - Social and Behavioral Sciences*, *191*, 1157–1160. https://doi.org/10.1016/j.sbspro.2015.04.312

Lee, A. M. I. (2019, August 5). *6 essential skills for reading comprehension*. Understood.Org;

Understood. https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/reading-issues/6-essential-skills-needed-for-reading-comprehension

Lewis, G., & Bedson, G. (1999). *Games for children*. Oxford: OUP.

Montano, R. (2019, March 22). Game-based learning uplifting interest in reading among struggling readers: An action research. TeacherPH. https://www.teacherph.com/game-based-learning-action-research/

Moore, A. L. (2014). A research review of cognitive skills, strategies, and interventions for reading comprehension. http://download.learningrx.com/reading-comprehension- research-paper.pdf

Pankin, J. (2013). *Schema theory*. http://web.mit.edu/pankin/www/Schema_Theory_and_Concept_Formation.pdf

Papatga, E., & Ersoy, A. (2016). Improving reading comprehension skills through the SCRATCH Program. *International Electronic Journal of Elementary Education*, *9*(1), 124–150. https://files.eric.ed.gov/fulltext/EJ1126664.pdf

Piaget, J. (1962). *Play, dreams and imitation in childhood*. New York, NY: Norton. Retrieved on May 7, 2019 from http://web.media.mit.edu/~ascii/papers/piaget_1952.pdf

PISA 2018 Results - Philippines. (2019). OECD.org https://www.oecd.org/pisa/publications/PISA2018_CN_PHL.pdf

Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist*, *50*(4), 258–283. https://doi.org/10.1080/00461520.2015.1122533

Pho, A., & Dinscore, A. (2015). Game-based learning spring 2015. https://acrl.ala.org/IS/wp-content/uploads/2014/05/spring2015.pdf

Robinson, R.V., & Good, T.L. (1987). *Becoming an effective reading teacher.* New York: Harper & Row Publishers.

Ronimus, M., Eklund, K., Pesu, L., & Lyytinen, H. (2019). Supporting struggling readers with digital game-based learning. *Educational Technology Research and Development*, *67*(3), 639–663. https://doi.org/10.1007/s11423-019-09658-3

Rumelhart, D. E. (1978). Schemata: The building blocks of cognition. In R. J. Spiro,B. C. Bruce, & W. F. Brewer (Eds.) *Theoretical issues in reading comprehension* (pp. 33–58). Hillsdale, NJ: Lawrence Erlbaum.

Seels, B., Glasgow, Z., & Seels, B. (1998*). Making instructional design decisions.* Upper Saddle River, NJ: Merrill. doi:http://ocw.metu.edu.tr/pluginfile.php/3298/course/section/1175/20121127 191305441.pdf

Seymour, K. (2017, January 16). Schema theory and reading comprehension. WeHaveKids; WeHaveKids.https://wehavekids.com/education/Reading-Comprehension-Theory

Shaffer, D., Halverson, R., Squire, K., & Gee, J. (2005). Video games and the future of learning. WCER Working Paper No. 2005-4.

Thiede, K. W., & de Bruin, A. B. H. (2018). Self-regulated learning in reading. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (pp. 124–137). Routledge/Taylor & Francis Group.

Toma, I., Iustinian, A., Dascalu, M., & Trausan-Matu, S. (2016). Reading space secrets - A serious game centered on reading strategies - ProQuest. Search.Proquest.Com. http://search.proquest.com/ openview/61b14d152f32f69b537877451608b081/1.pdf?pqorigsite=gscholar&cbl=396325

Torreon, J. (2010). *Activities for remedial reading* (Unpublished Master's Thesis). Bukidnon State University, Malaybalay City, Philippines.

Vacca, R., & Vacca, J. (1989). *Content area reading*. Curriculum Materials Center. Michigan: Scott Foresman Trade.

Vandercruysse, S., Vandewaetere, M., & Clarebout, G. (2012). Game-based learning. *Handbook of research on serious games as educational, business and research tools*, 628–647. https://doi.org/10.4018/978-1-4666-0149-9.ch032

von Gillern, S., & Alaswad, Z. (2016). Games and game-based learning in instructional design. *The International Journal of Technologies in Learning*, *23*(4), 1–7. https://doi.org/10.18848/2327-0144/cgp/v23i04/1-7

Vygotsky, L. (1978). *Mind in society: The development of higher psychological functions*. Cambridge, MA: Harvard University Press.

Ware, R. J. (2012). Middle school learners' perceptions of their interests in reading as defined by engagement and social interaction when using sustained silent reading, SSR, and peer interests reading strategies, PIRS. In *ERIC*. ProQuest LLC. https://eric.ed.gov/?id=ED548205

Ware, Colin. (2004). Information Visualization: Perception for Design: Second Edition.

Widdowson, H. G. (1983). *Learning purpose and language use*. London: Oxford University Press. 287.