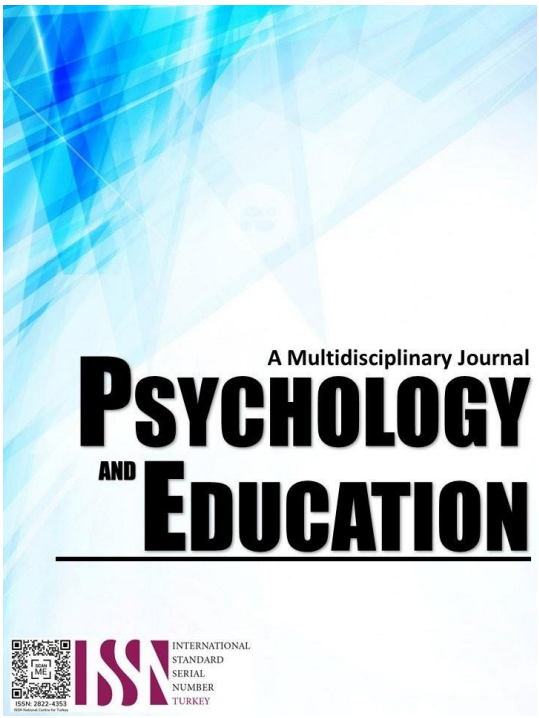
TECHNOLOGY ENHANCED READING REMEDIATION: ASSESSING THE ROLE OF DIGITAL TOOLS IN IMPROVING LITERACY AMONG GRADE 7 STUDENTS



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Research Article

Technology Enhanced Reading Remediation: Assessing The Role of Digital Tools in Improving Literacy among Grade 7 Students

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Abstract

The study aimed to assess the role of digital tools in improving literacy among Grade 7 students in a technology-enhanced reading remediation at Pedro Guevara Memorial National High School during the school year 2024-2025. The respondents of the study were students in Pedro Guevara Memorial National High School. The researcher purposively selects eighty (80) students. The respondents assessed the extent of the role of digital tools in a technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of engagement levels, progress monitoring, experience and satisfaction, student motivation and attitude, and peer collaboration. Moreso, the researcher utilized the pretest and posttest to determine the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation. The findings revealed that the digital tools in technology-enhanced reading remediation are greatly efficient in improving the literacy among Grade 7 students in terms of engagement levels, progress monitoring, experience and satisfaction, and peer collaboration. Also, student literacy assessment scores have greatly increased after the utilization of digital tools in technology-enhanced reading remediation. Grade 7 students' pretest and posttest scores show substantial differences utilizing the digital tools in technology-enhanced reading remediation. The literacy assessment scores of Grade 7 students significantly influenced by the utilization of digital resources in their instruction. As an outcome of the findings and the conclusions, the following recommendations were enumerated such as administrators may offer ongoing targeted professional development workshops to teachers focused on specific digital tools that can enhance literacy instruction. Administrators may encourage teachers to adopt a student-centered approach when using digital tools. Teachers may establish collaborative learning communities where teachers can share experiences, resources, and best practices related to digital tool usage. Teachers may promote in using interactive digital tools such as gamified learning platforms or collaborative writing apps to engage students actively in their literacy learning.

Keywords: *role of digital tools, improving literacy, technology-enhanced reading remediation*

Introduction

During the last several years, the educational environment in the Philippines has grown increasingly cognizant of the need of using technology with children, especially for the purpose of improving their vocabulary and reading abilities. Research was carried out at Pedro Guevara Memorial National High School to investigate the efficacy of a technology-based reading remediation program for seventh-grade pupils. The study highlighted the significant role that technology plays in addressing reading issues. This aligns with the Philippine government's mantra of enhancing the quality of education, which is enshrined in Republic Act No. 10533, also known as the Enhanced Basic Education Act of 2013. This act states that the retention of knowledge, in conjunction with an improved mode of instruction, is a way forward toward the improvement of learning outcomes.

Schools increasingly understand the significance of integrating students' complete being as a means of learning and growth, and technology is a crucial instrument in this regard. This recognition was made possible by the Department of Education across grades K through 12. This use of digital tools in paradigm in pace creation for reading not only tries to address the problem of inequality in literacy levels among students, but it also brings with it the qualities of interaction and flexibility, which are very difficult to achieve via the use of traditional techniques. The use of electronic forms of learning resources, such as e-books, educational software, and online assessments, can once again be of great benefit at Pedro Guevara Memorial National High School. This is because interventions are made one student at a time, which makes the recommended interventions a more effective method of enhancing access to education for each and every student.

The use of digital technologies in the instruction of literacy has also been subjected to research that has shown its favorable impacts. Research has shown that students' willingness to learn material is increased when they are given the opportunity to participate in enjoyable activities, such as interactive reading surfaces and gamification interfaces and other similar activities. Students in seventh grade, who may already be coping with a variety of challenges related to puberty, might benefit from these tools because they improve reading comprehension and fluency in a manner that is more comfortable to them. The ability to construct lessons that incorporate the interests of students while also ensuring that they are able to think critically and work in groups is something that instructors are able to do in today's world.

One of the most important factors in the success of the digital learning projects at Pedro Guevara Memorial National High School is the participation of the school's instructors, parents, and people of the community. When it comes to adopting technological solutions in classrooms, this engagement receives support from the local stakeholders, which helps to tackle the issues that arise in terms of

resources and training in technology. This is necessary in order to provide assistance to instructors. Students are better prepared for future developments in politics, economics, society, technology, and other areas when they participate in such teamwork since it makes learning and invention easier.

These are some of the ways that existing and new technologies could really help the overall literacy skills of Pedro Guevara Memorial National High School students, especially those in Grade 7. These technologies have made teaching and learning better. As a result, the school not only helps to address the literacy challenges that are prevalent in today's society, but it also strives to advance the objectives of the Philippine educational system via the use of technology in reading remediation. It is essential that these kids be provided with equal possibilities to guarantee that they make the most of the technology that will, in turn, influence their future. This is because the purpose of this endeavor is to determine whether or not it is possible to acquire relevant knowledge via the use of digital resources.

Research Questions

This study aimed to assess the role of digital tools in improving literacy among Grade 7 students in a technology-enhanced reading remediation at Pedro Guevara National High School during the school year 2024-2025. Specifically, this study sought to answer the following sub-problems:

1. What is the extent of the role of digital tools in a technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of:
    1.1. engagement levels;
    1.2. progress monitoring;
    1.3. experience and satisfaction; and
    1.4. peer collaboration?
2. What is the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores?
3. Is there a significant difference on the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores?
4. Is there a significant relationship between the extent of the role of digital tools in technology-enhanced reading remediation and the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their posttest scores?
5. Based on the findings of the study, what plan may be proposed?

Literature Review

Role of Digital Tools in Improving Literacy

The role of digital technology in improving literacy skills of primary school students is inseparable from utilizing digital devices and applications such as e-books, educational videos, learning apps and other interactive tools to enrich learning materials and support more engaging and effective teaching methods. These technologies can easily access various learning resources, realize personalized learning, and provide real-time feedback to comprehensively improve primary school students' reading, writing and information comprehension skills. The study conducted in this research uses a literature research method. The results show that digital technology provides wide access to various learning resources, such as e-books, educational videos, and interactive applications that can be customized to the individual needs of students. These technologies not only enrich teaching materials, but also make teaching methods more interesting and interactive, thus having a great impact on primary school students (Jasuli, 2024).

Digital literacy directs learners towards innovative, creative and transformational learning in the 21st century. It is one of the core competencies in the Competency Based Curriculum. The objective of this study was to assess the availability of ICT infrastructure in public primary schools to develop learners' digital skills. Constructivist learning theory guided the study. Concurrent embedded mixed method was used. A population of 5713 was targeted for study where a sample of 571 respondents composed of 8 head teachers, 78 teachers and 485 grade six learners were selected. Stratified random, simple random and purposive sampling procedures were used to select the study sample. Data collection instruments included interviews, questionnaires, focused group discussion and observation schedule. Descriptive statistics were used to analyze quantitative and qualitative data. Some of the key findings of the study were majority of public primary schools in Kasipul lack internet connectivity and only 32.1% have computer labs. The results further indicated that teachers have basic knowledge and skills in digital literacy. However, only 23.2% of teachers have been trained in digital literacy. The study recommends that Ministry of education in collaboration with Ministry of Information and Communication Technology enhance internet connectivity in all primary schools to support implementation of digital literacy to develop learners' digital skills.

The era of digital development that dominates the world with the sophistication of today's internet networks, especially the impact of the COVID-19 pandemic, has created a learning system using mobile phones with internet networks. On the one hand, there are negative and positive impacts. The article aims to analyze earnings in the Digital Age Full of Hedonistic Cultural Values Among Elementary

School Students. This research method is qualitative with a literature review approach. From the collected literature, this study shows negative values with hedonistic behavior, which then becomes a habit that has a negative impact. It was inseparable from the cell phones used by children as learning media. Still, at that time, parental control was not maximal over cell phone features, which became a consumptive spectacle that impacted children's behavior. Therefore, this new insight becomes a new idea to support similar research in the future (Aslan, 2023).

Likewise, Bacak (2022) stated that Children interact with digital devices for learning and entertainment at an early age. This study examines elementary educators' perceptions of student digital safety based on their interactions with others using technology in the classroom. Through a qualitative interview study, we analyzed data collected from ten elementary educators, including classroom teachers, media specialists, and instructional technology facilitators. Educators shared that their students interact with one another using technology for a variety of social and learning purposes in the classroom. Additionally, teachers described negative interactions with technology they have observed in their classrooms with elementary students, including incidents of cyberbullying and access to inappropriate content online. Findings from this study support the design of instructional materials for elementary student digital safety and have implications for teachers, parents, students, and administrators.

Hock, et al (2020) examined various studies on the integration of technology in literacy instruction. The authors highlight how digital tools such as e-books, mobile applications, and online platforms facilitate differentiated instruction and engagement among students. They argue that technology can enhance reading comprehension, vocabulary development, and motivation, particularly in struggling readers. Recommendations for effective implementation and future research directions are provided. Also, Roskos (2020) synthesized findings from intervention studies focusing on digital tools designed to promote early literacy skills. The analysis reveals significant benefits in phonological awareness, print knowledge, and vocabulary acquisition when using interactive digital formats. The authors advocate for the purposeful selection of technologies and teacher training to maximize the effectiveness of digital literacy interventions. This study explores the effects of mobile-assisted language learning (MALL) on reading comprehension among middle school students. Results indicate that students who utilized mobile applications to support their reading practice showed significant improvements in comprehension scores compared to those who followed traditional methods. The authors discuss implications for integrating mobile tools into literacy instruction (Lai, 2020).

According to the study of Kucirkova (2021) investigated the effects of personalized digital reading experiences on children's literacy development. The authors argue that digital tools allow for greater customization of reading materials, catering to individual interests and reading levels. Findings suggest that personalized reading experiences can lead to increased motivation and engagement, ultimately enhancing literacy outcomes among young readers. Further, Jang (2021) examined the effectiveness of multimedia presentations in teaching reading skills to struggling students. The findings indicate that integrating visual and auditory elements enhances students' understanding and retention of reading materials. The authors emphasize the importance of multimedia tools in creating engaging learning environments for students with reading difficulties.

Engagement Levels

One of the fundamental components of the United Nations' sustainable development 2030 agenda is quality education. It aims to ensure inclusive and equitable quality education for all. Digital technologies have emerged as an essential tool to achieve this goal. These technologies are simple to detect emissions sources, prevent additional damage through improved energy efficiency and lower-carbon alternatives to fossil fuels, and even remove surplus greenhouse gases from the environment. Digital technologies strive to decrease or eliminate pollution and waste while increasing production and efficiency. These technologies have shown a powerful impact on the education system. The recent COVID-19 Pandemic has further institutionalized the applications of digital technologies in education. These digital technologies have made a paradigm shift in the entire education system. It is not only a knowledge provider but also a co-creator of information, a mentor, and an assessor. Technological improvements in education have made life easier for students. Instead of using pen and paper, students nowadays use various software and tools to create presentations and projects. When compared to a stack of notebooks, an iPad is relatively light. When opposed to a weighty book, surfing an E-book is easier. These methods aid in increasing interest in research. This paper is brief about the need for digital technologies in education and discusses major applications and challenges in education (Haleem, 2022).

As the number of students identified with disabilities grows, schools moving towards inclusive classrooms are concerned with ensuring engagement of all students. Research has shown that digital technology provides support for students with disabilities so that they can participate in classroom activities. This research has been largely quantitative with a focus on student participation and improving academic outcomes. Moreover, the qualitative research has defined engagement as increasing attention on learning tasks. However, we do not know how and whether digital technology can generate interactions among these students and their peers or their teachers. This paper used qualitative data from six Ontario, Canada school boards, including 27 classroom observations and interviews with teachers, to explore the role that digital technologies (i.e. robotics, smartboards, iPads) play in facilitating greater engagement among students with disabilities. In particular, this study confirms that digital technologies can play a major role in boosting engagement through support and greater access to classroom content and learning processes. It add to the literature by postulating that digital technologies enhance classroom rituals and interactions by giving students a literal and figurative voice, and through changes in interactions among students with disabilities, their peers, and teachers. Additionally, students with disabilities who are adept at using digital technology

can generate a form of capital that displays a type of credibility with their teachers and peers (Rizk, 2022).

Advances in digital technologies are dramatically altering the texts and tools available to teachers and students. These technological advances have created excitement among many for their potential to be used as instructional tools for literacy education. Yet with the promise of these advances come issues that can exacerbate the literacy challenges identified in the other articles in this issue. Rather than seeing technology as something to be fit into an already crowded education agenda, Biancarosa and Griffiths argue that technology can be conceptualized as affording tools that teachers can deploy in their quest to create young readers who possess the higher levels of literacy skills and background knowledge demanded by today's information-based society. Biancarosa and Griffiths draw on research to highlight some of the ways technology has been used to build the skills and knowledge needed both by children who are learning to read and by those who have progressed to reading to learn. In their review of the research, Biancarosa and Griffiths focus on the hardware and software used to display and interface with digital text, or what they term e-reading technology. Drawing on studies of e-reading technology and computer technology more broadly, they also reflect on the very real, practical challenges to optimal use of e-reading technology. The authors concluded by presenting four recommendations to help schools and school systems meet some of the challenges that come with investing in e-reading technology: use only technologies that support Universal Design for Learning; choose evidence-based tools; provide technology users with systemic supports; and capitalize on the data capacities and volume of information that technology provides (Biancarosa, et al., 2022).

Digital technologies have brought changes to the nature and scope of education and led education systems worldwide to adopt strategies and policies for ICT integration. The latter brought about issues regarding the quality of teaching and learning with ICTs, especially concerning the understanding, adaptation, and design of the education systems in accordance with current technological trends. These issues were emphasized during the recent COVID-19 pandemic that accelerated the use of digital technologies in education, generating questions regarding digitalization in schools. Specifically, many schools demonstrated a lack of experience and low digital capacity, which resulted in widening gaps, inequalities, and learning losses. Such results have engendered the need for schools to learn and build upon the experience to enhance their digital capacity and preparedness, increase their digitalization levels, and achieve a successful digital transformation. Given that the integration of digital technologies is a complex and continuous process that impacts different actors within the school ecosystem, there is a need to show how these impacts are interconnected and identify the factors that can encourage an effective and efficient change in the school environments. For this purpose, we conducted a non-systematic literature review. The results of the literature review were organized thematically based on the evidence presented about the impact of digital technology on education and the factors that affect the schools' digital capacity and digital transformation. The findings suggest that ICT integration in schools impacts more than just students' performance; it affects several other school-related aspects and stakeholders, too. Furthermore, various factors affect the impact of digital technologies on education. These factors are interconnected and play a vital role in the digital transformation process. The study results shed light on how ICTs can positively contribute to the digital transformation of schools and which factors should be considered for schools to achieve effective and efficient change (Timotheou, 2022).

Engagement with reading falls around the age of 11 or 12, and there is widespread concern with levels of literacy amongst adolescents. Most research examines how digital tools facilitate preschoolers' reading or reading motivation outside school. Less research is conducted in the school context, particularly with older pupils. The empirical evidence is examined, definitions of effectiveness, and facilitators and barriers are identified. Findings show the evidence base is varied, but robust; digital tools are effective in motivating adolescents' reading interest and improving their reading skills and test scores; teachers are key facilitators in the process. Findings are in line with research with younger age-groups suggesting the transferability of research across a wide age-range. Implications for practice and suggestions for developing research in this area are identified. Overall, the research reviewed for this study supports the argument that digital tools are able to facilitate adolescents' reading engagement, particularly for those students who are struggling to read or make slow progress in reading. The main findings of the included studies are also consistent with research with younger pupils which demonstrates that the use of digital tools can support reading by improving their reading skills and reading test scores, including those of poorer readers. These studies also identified teachers as important facilitators who can help children increase reading motivation by combining technology with pedagogy, also by providing engaging classroom activities as well as appropriate feedback and support. Hence, the results of this systematized review align with existing research conducted with younger pupils. This confirmation of the transferability of research findings from studies with younger pupils to adolescent populations provides support for the use digital tools with this older age group and expands the evidence base which teachers should feel able to draw on in developing their practice. The positive impact of digital tools used to support adolescents' reading in schools identified in this systematized review provides guidance for educational practitioners in how they might deal with the issue of literacy drop-off. The adoption of digital tools in school is likely to support teenagers to engage more in reading activities. Meanwhile, reading skills could also be improved due to increased interest in reading, which is identified in four of the included studies (Walton et al., 2019). Apart from using digital tools to help adolescents read, the role of teachers has consistently been found to be important. Teachers can act either as facilitators or barriers depending on the appropriateness of their pedagogical approach and their knowledge and understanding of digital tools. This suggests that training opportunities for teachers to develop their skills in digital tools will be important if these are to be used by more than those who have a particular personal interest in education technology. From the reviewed findings, recommended teaching methods including identifying students' different needs and providing corresponding feedback and aids, combining digital tools and classroom activities in class, and leaving students with opportunities to independently read and select information. Teachers' collaboration with colleagues

and university researchers is also helpful in effectively using digital tools in class.

Finally, this study has reported on a systematized review which did not have quality inclusion criteria. Nevertheless, the included studies were all found to be of a reasonably high standard. The diversity in methodological approaches is likely to reflect a diversity in disciplinary background of researchers and the balance found suggests that both subjective experience and objectively measurable improvements are being taken equally seriously. Where future research uses a mixed methods approach, we would recommend giving equal attention to the rigor with which qualitative measures are applied, analyzed and reported (Chen, 2022).

Progress Monitoring

Reading comprehension is essential for children's school success and adult engagement in most fields. Many computer-assisted training packages are intended for education, according to the literature. The findings show improved reading comprehension using materials other than those used in training. Few research examined the effectiveness in children with particular reading comprehension impairments, and none examined the possibilities of coaching at home under professional supervision. These latter traits distinguish Cloze from other literature. Cloze is built on a rehabilitation online platform that enables children to do individualized training exercises many times a week without leaving home, while clinicians may assess progress and control activity parameters. This approach improves the number of weekly training sessions, saves time getting to the rehabilitation facility, and lowers intervention expenses. These findings suggest that clinicians and teachers should consider children's starting resources and, if necessary, combine distance rehabilitation programs with personal intervention sessions to teach strategies and promote metacognitive reading comprehension. However, this study's shortcomings must be acknowledged. The trial started without a control group, therefore results should be interpreted cautiously. However, normative data and historical test results support our conclusions. As a passive control group, normative data measures reading comprehension in normally developing youngsters without instruction. Despite having comparable reading comprehension difficulties, the treated group was diverse because children were in various grades and had varied diagnoses. The small number of respondents prohibited the development of grade and diagnostic groups, making it difficult to analyze these aspects as between-subject factors. Future research should explore a more homogenous population or a bigger sample of children to determine training effectiveness in diverse kid groups. The therapy ended with the post-training examination, therefore there was no follow-up to evaluate the technique and maintenance effects. Despite its limitations, this research shows that computer-assisted training programs can improve high-level abilities like comprehension and inference creation. Struggling readers who require help with higher-level reading comprehension may benefit from such technologies (Capodieci, 2020).

Progress monitoring is a process of collecting ongoing samples of student work and tracking performance of individual students over time. Progress monitoring involves administering parallel sets of items to the same student on a regular basis (at least monthly) that are sensitive to changes in the student's understanding based on instruction. The sets of items administered over time should be parallel in difficulty so that differences in performance can be attributed to differences in the student's understanding as opposed to variability in item difficulty across sets. In this manuscript, we describe an approach to designing items that controls item-level variability by constraining the item features that may elicit different cognitive processing. This approach adapts the principles of Automated Item Generation (AIG) and includes carefully designing test specifications, isolating specific components of the content that will be assessed, creating item models to serve as templates, duplicating the templates to create parallel item clones, and verifying that the duplicated item clones align with the original item model. An example from an operational progress monitoring system for mathematics in Kindergarten through Grade 6 is used to illustrate the process. It also proposed future studies to empirically evaluate the assertion of parallel form difficulty. The study demonstrated the value of using an adapted AIG process to facilitate rapid development of a progress monitoring system in mathematics. Content-related validity evidence supported the claims that both content and structure of the items were consistent across forms. Additional empirical evidence is needed to substantiate these claims. (Geller, 2022).

Moreso, Educational inequalities – i.e., the achievement gaps between pupils from disadvantaged backgrounds and their peers from advantaged backgrounds – are present in many OECD countries. This is particularly problematic in reading, which is a predictor of future academic and social success. To reduce this reading achievement gap, recent meta-analyses point toward progress monitoring: regularly measuring pupils' mastery levels and differentiating instruction accordingly. However, the research recommendations only slowly make their way to teaching habits, particularly because teachers may consider progress monitoring difficult and cumbersome to implement. To avoid such difficulties, partnerships between teachers and researchers have been recommended. These allow teachers' complex realities to be considered and, consequently, tools to be designed that are meaningful and feasible for practitioners. Five teachers in the French-speaking part of Belgium co-constructed four tools during four focus groups. The transcribed discussions were analyzed using an interactional framework containing three areas of knowledge: shared, accepted, and disputed. The results indicated three shared needs: perceived usefulness, flexibility of the tools, and a desire to limit the workload. In addition, teachers accepted that, between them, needs varied regarding the goal for progress monitoring and the format of the evaluation. They had lengthy discussions on balancing workload and perceived utility, leading them to conclude that there were two groups of teachers. The first group questioned the added value of the progress monitoring tools in relation to their habitual practice. The second group on the other hand described the added value for the teacher, certainly when aiming to grasp the level and difficulties of struggling pupils. This second group had fewer years of teaching experience and described their classroom practice as less organized compared to the teachers from the first group. Theoretical and practical implications of these findings are discussed below (Francotte, 2023).

Student progress monitoring helps a teacher to define a student's current performance level on skills to be learned in a particular year, identifies his year-end achievement goals, and establishes the progress rate at which he has to work to achieve the goal. A teacher is also able to create and strategize effective teaching approaches to cater for a student's level of readiness and learning needs and fulfill appropriate stretch goals for further learning. While there are many existing assessment tools for teachers and the school system to use at monitoring a student's proficiency in Mathematics, this article has chosen to share findings related to the application of the easy and simple to use Expected Target Result approach in one of the districts in Malaysia. Using average school grades in the Year Five examination as Take-Off Value, the approach was able to provide information on the progress of all students and all schools according to subject and type of school. Based on the benchmarks generated for each subject by this approach, teachers are able to define effective teaching methods to cater for continuous progress in students' work (Yaziz, 2020).

Experience and Satisfaction

The rise of technology has altered the way in which pupils acquire knowledge. The purpose of this research is to assess the general degree of digital literacy among students as well as their level of contentment with online education. The research was carried out with the participation of 210 undergraduate students from San Isidro College who were chosen at random. In this study, a correlational research strategy was used, and a questionnaire that was based on the digital literacy skills framework as well as an online learner satisfaction survey were utilized. Step two of the process. In general, they are pleased with the online learning they have received. On the other hand, there is only a minor association between the degree of literacy and the level of happiness with taking classes online. the relationship between digital literacy and satisfaction with online learning, according to the findings of the research. Based on the findings of the research, it can be concluded that the learners' level of digital literacy is elementary. Moreover, the findings of the research indicate that the learners are most content with their contacts with other students, while they are the least content with their interactions with other teachers. Within the context of online learning interaction, they report a high level of overall satisfaction. The students' degrees of digital literacy do influence their overall pleasure with online learning; nevertheless, the students' digital literacy does not have a major impact on their overall contentment. There is also the possibility that we will carry out research to investigate the various points of view about digital literacy and online education (Taja-on, 2023).

The COVID-19 pandemic has unexpectedly affected the educational process worldwide, forcing teachers and students to transfer to an online teaching and learning format. Compared with the traditional face-to-face teaching methods, teachers' professional role, career satisfaction level, and digital literacy have been challenged in the COVID-19 health crisis. To conduct a systematic review, we use critical appraisal tools from the University of the West of England Framework We removed the irrelevant and lower-quality results to refine the results and scored each selected paper to get high-quality studies with STARLITE. The number of finally included studies is 21. We used the PICO mnemonic to structure the four components of a clinical question, i.e., the relevant patients or population groups, the intervention (exposure or diagnostic procedure) of interest, as well as against whom the intervention is being compared and considered appropriate (outcomes). We formulated five research questions regarding teachers' professional role, satisfaction, digital literacy, higher educational practice, and sustainable education. The study found that teachers' professional roles changed complicatedly. Moreover, they were assigned more tasks during the online teaching process, which also implicated a decline in teachers' satisfaction. After the COVID-19 pandemic, it is necessary to conduct a blended teaching model in educational institutes. Teachers should have adequate digital literacy to meet the new needs of the currently innovative educational model in the future. In addition, the study reveals that teachers' digital literacy level, career satisfaction, and professional role are significantly correlated. We measured to what degree the three factors affected the online teaching and learning process. Ultimately, the study may provide some suggestions for methodological and educational strategies (Li, 2022).

Online technology is important, and digital scientific research is growing. Researchers are urged to employ digital technologies. Thus, these new ICT-based instructional tools are welcome and may assist overcome some of the issues with in-depth literature reviews. Technology is everywhere, including education. Technology has given us the tools to make education more engaging and inventive. Education systems have faced changing pressures throughout the decades. Labor market workers need technical, methodological, social, and personal skills. Modern education attempts to develop a new paradigm that prepares future workers for new difficulties. This transformation is accompanied by new pedagogic ideas like blended learning, which mixes face-to-face and online learning with digital teaching tools to create needed capabilities. The epidemic has increased the use of digital technologies in teaching dramatically, necessitating rules. This paper emphasizes the necessity for students and instructors to improve digital skills by introducing digital technologies into education. This will help teachers and administrators use these technologies post-pandemic. Future education systems will encounter digitization issues. Our goal is to provide a complete overview of digital technologies in education and their integration. This study highlights the potential of digital tools to enhance the teaching-learning process and have "side 'effects' that can contribute to the continuous improvement of learners' competencies since they have not yet been fully integrated. Digital technologies can help kids develop active problem-solving, communication, and critical thinking skills. Keep in mind the pupils' ages while using the tools to guarantee proper skill development. Digital technologies in education help pupils grasp science (Dancsa, 2023).

Peer Collaboration

The greatest degree of group work is collaboration, when people solve an issue. Information and communication technology aids cooperation. As a participative, communicative instrument for collaboration and knowledge co-construction, digital technology may

improve learning experiences. Collaboration is a highly effective yet difficult teaching and learning strategy. Many students shun teamwork for many reasons. This examination identified three skill-level groupings of pupils. Further investigations demonstrated that students with varied digital abilities differ in their experiences in collaborative online learning, but not in their attitudes on the phenomena, technology, or computer hardware. Differences are greatest between low and high skill groups. There are also disparities between low, moderate, and high skill groups. These results support the need to individualize teaching and learning and emphasize the need of digital competency for all learners. This article's research has limitations. The study focused on subjective skill evaluation, not competencies. The appraisal may be affected by self-confidence, self-esteem, self-efficacy, social approbation, or personality. Including them in future initiatives is beneficial. Using precise or neutral tools is also crucial. It is evident that the provided study does not address all digital skills challenges in collaborative learning. More research could examine how well collaborative learning works as a teaching method, the relationship between digital skills and IT tools, cooperation models to make these activities more organized and easier, and the nature and growth of communication and interaction in collaborative learning. Further study should monitor the teaching of digital skills in collaboration in adult courses and academic education, especially in schools, where these abilities are developed early in life. Teacher preparation is crucial to teaching and developing students' abilities (Kwiatkowska, 2022).

Also, technological advancements in information flow have created the digital world, which most pupils struggle to understand. The environment's information resources need information literacy abilities. The difficult process of learning information literacy requires student cooperation. Learning via collaboration lets students work together to attain a goal. The paper is literature-based research that discusses the information literacy skills students need to adapt to the digital environment, collaborative platforms to improve their acquisition, the importance of student collaboration, and its challenges and strategies to improve student collaboration. Allowing pupils to choose their own norms may improve their collaboration's shortcomings. Find out what kids need from their classmates. Using student-to-student discussions to engage students in the learning process might help accomplish collaborative objectives among team members. A diversity of interaction during big group conversations enhances learning. The article argues that pupils need information literacy abilities to navigate the digital world successfully. However, learning the necessary abilities requires teamwork among students due to its complexity. By learning from peers, students may enhance their information literacy abilities and effectively use internet resources (Ojobor, 2021).

Since COVID-19, internet teaching tools are required in schools. The research examines EFL students' views on online and face-to-face peer cooperation and communication. With the rising interest in digital platforms, many educational institutions were considering online courses, but the COVID-19 pandemic hastened the process and made it an essential need for schools and colleges. This abrupt transformation offers institutions and students possibilities and difficulties. Online classrooms may make it difficult to teach foreign languages and encourage student cooperation. A qualitative research approach was used to examine the phenomena from inside. The participant group is studying English at a public institution in hybrid mode. As they experience both face-to-face and online education, students should be able to compare peer communication and cooperation. Semi-structured interviews were used to uncover EFL learners' perspectives, and content analysis was used to analyze qualitative data. The qualitative results showed that EFL students preferred face-to-face lessons because they felt more true and honest communication was possible. However, students also mentioned several possibilities afforded by online programs and made some excellent recommendations for improving them (Sarac, 2022).

The technology-supported education systems seamlessly integrated throughout the globe in response to the demands of post Covid-19 pandemic. The swift developments of the digital tools with Artificial Intelligence (AI) support are also readily diffused among the educational communities. This research paper investigates the synergistic impact of digital literacy, the incorporation of AI tools, and Peer Supported Collaborative Learning (PSCL) on the learning perceptions of university students. The research aims to discern the implications of these technological and social facets on students' attitudes towards AI assisted learning process. Structured questionnaire-based survey among the University students were done for this descriptive research. It is found that the students' Digital Literacy, Use of AI tools and PSCL on AI assisted learning were positively correlated. The partial mediatory path through the PSCL and AI tool usage has a significant positive influence on students learning process. The insights gathered from this study can inform educators, policymakers, and institutions on optimizing the amalgamation of digital literacy, AI tools and PSCL to enhance the contemporary learning environment. As universities navigate the digital age, this research provides a nuanced understanding of the dynamics shaping students' perceptions, offering valuable insights into the multifaceted aspects of AI influencing the educational landscape (Genimon, 2024).

Level of Literacy Assessment Scores

Science is the methodical organization of information into testable universe descriptions and projections. Several nations want to make scientific literacy the focus of education. This quantitative research examined Lahore government secondary school science students' scientific literacy. Proportionate stratified random and purposive sampling selected 16 government secondary schools in Lahore, seven boys' and nine girls. Five percent of the population chose the schools. The Bybee Scale was used to develop the exam with two to ten contextual circumstances and four scientific literacy levels. The research used percentage, mean, t-test, and ANOVA. Results showed that secondary school science students had the lowest nominal and functional scientific literacy. Girls outperformed boys in all scientific literacy levels. No difference in student results based on moms' education or skill level. Students scored differently based on their dads' education, skill level, and scientific study time (hours per day, at school and at home). To improve scientific literacy, secondary school science textbooks should include scientific literacy principles and exercises. Government schools should lengthen science classes.

These strategies should be used by all instructors, particularly males, to foster critical thinking (Shahzadi, 2020).

The importance of cultivating creativity in language education has been widely acknowledged in academic literature. In this respect, digital technologies can play a key role in achieving this endeavor. The socio-cultural conceptualization of creativity stresses the role of communication, collaboration and dialogical interaction of creative expression in language education. The objective of this paper is to study literature focusing on cases of collaborative creativity and technology embedded in language education. Results show that the features of digital technology unfold a range of learning opportunities in language education and can play three different roles in promoting collaborative creativity as a tutoring device that guides the implementation of key co-creation skills; as a tool that enables and shapes the development of co-creative thinking skills; and as a medium that creates rich and resourceful environments to stimulate the emergence of collective creative processes. The paper also reveals that these three roles can be performed using a wide range of interactive technologies that encourage students to participate in a rich, co-creative language learning experience and equip learners with key competences to approach complex problems in a globalized and hyper-connected world. Finally, this paper may contribute to developing future language technology-enhanced learning projects capable of promoting key collaborative and creative processes (Sastre, 2022).

The work environment has changed considerably over the past few decades, with the development of information and communications technology (ICT). This has led to organizational transformation and the democratization of teleworking and hybrid work. Employee work dynamics have changed to accommodate these new practices, and because of the transformation of ICT activities, students now need specific skills to become part of the knowledge society. The development of information and communication technologies has changed our way of working, emphasizing the need for individuals to develop collaborative skills. The present systematic review aimed to investigate the degree to which digital tools can foster the development of these skills. However, the effects differ significantly based on the specific tools, methods, and measures employed. It also revealed that most studies conducted were in the social sciences, primarily among students, with half of them focusing on short interventions. Another finding was that little is known about the features of the digital tools that contribute to these effects. Research on the role of digital tools in enhancing collaborative skills is still in its early stages, necessitating more rigorous methods and measures (Cherbonnier, 2024).

Within the context of secondary school teachers planning for their students' use of digital tools for collaboration and communication, this paper explores the variables that influence teachers in this regard. Interviews were conducted with six social studies instructors in Oslo to learn about the ways in which they promote digital working relationships and communication. collaboration is shown by the findings, which show that professors do, to some degree, promote collaboration, both in the form of students working together on writing assignments and exchanging files with one another. Nevertheless, there is a limited amount of connection between students via the use of digital resources as an integral component of the instructional process. In the absence of being specifically questioned about it, none of the educator's cited communication via the use of digital means as a component of basic competency. According to the findings of the interviews, it is very probable that the limitations of time and the students' lack of digital competence are the obstacles that prevent them from using digital technologies for the purposes of cooperating and effectively communicating. Since all the students are present at the same location at the same time, it is seen to be unnecessary to spend time on things like supporting digital communication and collaboration. The results of the study suggest that it would be beneficial to enable work that is both methodical and planned, including digital skills, including communication and engagement (Midtlund, 2021).

The rapid expansion of digital connectivity has provided youth with wide-ranging access to digital platforms for communication, entertainment, and education. In light of this profound shift, there have been growing concerns about online safety, data privacy, and cybersecurity. A critical factor influencing the ability of youth to responsibly navigate digital platforms is digital literacy. While digital literacy programs have been implemented in various regions worldwide, significant disparities remain not only in overall digital literacy levels, but also the assessment of digital literacy initiatives. To address these challenges, an environmental scan and literature review were conducted to identify existing digital literacy programs in Canada developed specifically for youth, as well as digital literacy assessment tools, respectively. Given the growing importance of digital competencies, a youth-focused program and assessment tool are crucial for understanding and addressing digital literacy among this vulnerable cohort. This program's adaptability allows for customization across sociodemographic target groups, including culturally diverse and geographically remote communities—an aspect that has the potential to enhance digital literacy across settings. Implementing digital literacy programs can better prepare youth for an increasingly digital world, while minimizing potential risks associated with technology use (Buchan, 2024).

Synthesis

ICT-facilitated teaching and learning has gradually become part of the teaching and learning process, particularly in teaching literacy to students. Research consistently demonstrates that technology has a significant impact on improving the literacy levels of individuals across all age groups. Interactive e-books and educational applications empower educators to create a more effective and engaging learning environment, thereby enabling every student to achieve success.

Hock and Lembke (2020) support the idea of using technology in literacy lessons to improve students' learning experience. In their review, they point out that the facility of using e-books and other forms of software in education supplements the process of reading by also enhancing motivation among students. For students who face, for example, reading difficulties, these tools offer more approachable content and activities and make reading less of a chore. According to the authors, overall literacy benefits are derived

from increased motivation and student engagement with the texts read.

Another important line of research is early literacy development, with a focus on the use of interactive e-books. Roskos and Neuman (2020) conducted a meta-analysis which revealed that these digital resources significantly enhanced sons' phonemic awareness and vocabulary compared to print-based resources. The features, such as the read-aloud and the bright illustrations that characterize the e-books, help to engage the young learners. Such points assist children in achieving appropriate literacy while making it engaging and fun, which in turn sustains the child's love for reading.

Another category of mobile-based learning, a sub-aspect of digital learning tools, includes mobile applications designed to facilitate literacy learning. Liu et al. (2021) focused their research on understanding the efficiency of learning applications designed for young learners. Their studies suggested that applications that target phonics and vocabulary especially enhance the students' abilities in literacy. Children can learn literacy skills beyond classroom practice thanks to the mobility and usability of applications, allowing them to continuously practice what they learn in a learning institution.

The use of information and communication technology (ICT) to improve literacy is a multifaceted approach, as shown by a large number of research. The use of interactive e-books, educational software, and mobile apps makes it simpler to deliver a variety of lessons that not only have the potential to captivate the attention of students but also provide the learner with the opportunity to practice and improve on certain abilities. Aside from that, the tools in question not only assist in the development of reading and writing abilities, but also in the development of a good attitude toward reading and writing. This attitude plays a vital role in the development of a lifelong learner and reader, in addition to the achievement of excellent academic performance. Consequently, as we go further into the period of technological growth, it will be of the utmost importance to expand on these more inventive methods of making literacy instruction more accessible.

Methodology

Research Design

The study adopted descriptive research design. Descriptive research aimed to accurately and systematically describe a population, situation, or phenomenon. It can answer what, where, when, and how questions, but not why questions. A descriptive research design can use various research methods to investigate one or more variables (Fraenkel, Wallen, & Hyun 2019). And since the primary focus of this study was to assess the role of digital tools in improving literacy among Grade 7 students in a technology-enhanced reading remediation at Pedro Guevara Memorial National High School during the school year 2024-2025.

Furthermore, the researcher used this kind of research to obtain firsthand data from the respondents to formulate rational and sound conclusions and recommendations of the study.

Also, the researcher considered this kind of research design because this approach was quick and practical in terms of the financial aspect and is advantageous due to its flexibility, which can use for quantitative data, giving the researcher greater options in selecting the instrument for data-gathering. And lastly, a descriptive research design can be used in various research methods to investigate one or more variables.

Respondents

The general population of this study refers to the selected students of Grade 7 at Pedro Guevara Memorial National High School. To determine the sample respondents, the study employed non-probability sampling utilizing the purposive sampling technique in determining the respondents of the study.

The respondents of the study were students at Pedro Guevara Memorial National High School. The researcher purposively selects eighty (80) students. The respondents assessed the extent of the role of digital tools in a technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of engagement levels, progress monitoring, experience and satisfaction, student motivation and attitude, and peer collaboration. Moreso, the researcher utilized the pretest and posttest to determine the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation.

Instrument

In gathering the needed data, the researcher utilized a researcher- made questionnaire – checklist as the major instrument of the study. Part 1 – This section determined the demographic profile of the respondents. Part 2 – This part determined the extent of the role of digital tools in a technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of engagement levels, progress monitoring, experience and satisfaction, and peer collaboration; Part 3 determined the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores.

The survey questionnaire that was used in the research was given to the adviser to gain preliminary feedback and ideas for improving the questionnaire checklist. Following the modification of the instrument, the researcher's questionnaire checklist was evaluated by specialists with a suitable background in test building and on the subject to remark on its content for the finalization of the questionnaire

checklist items. Professors from the University of Perpetual Help System Dalta and supervisors and instructors from the Division of Laguna assessed the questionnaire checklist. The researcher selects them specifically since they were all active in the program.

Procedure

The study was carried out in accordance with the Gantt chart. Permission to conduct the research was obtained from the Office of the Schools Superintendent of Laguna and Office of the School Head at Pedro Guevara Memorial National High School, Division of Laguna.

The researcher verified the questionnaire with the help of experts and those informed about the competence and job satisfaction of teachers in public schools. When the questionnaire was finalized, it was distributed to people who took part in the research. The questionnaire was then obtained, and the gathered data were analyzed using an appropriate statistical tool. The interpretation and conclusions drawn from the collected data had consequences which may support or contradict the results of earlier research on the same subject. Similarly, the researcher provided a summary of the study's findings and conclusions, as well as some suggestions based on the findings and conclusions. Finally, the remaining chapters of the study, as well as preparation for the researcher's final oral defense, were finished.

Data Analysis

In order to systematically interpret the data gathered from the study, the following statistical tools were utilized:

To determine the extent of the role of digital tools in a technology-enhanced reading remediation in improving literacy among Grade 7 students; weighted mean was used.

To determine the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores; frequency and percentage distributions and mean were used.

To find out if there is a significant difference in the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores; t-test was applied.

To find out if there is a significant relationship between the extent of the role of digital tools in a technology-enhanced reading remediation and the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their posttest scores; Pearson-r correlation was used.

Ethical Considerations

Ethical issues are therefore important to consider every time research is conducted with learners in Thai secondary schools on the effects of using brain-based learning practices on their science achievements. In the first place, there is a need to have the consent of students and their guardians through informed consent. In this category, the researcher must clearly explain the study's objectives, the procedures to follow, and the potential risks or benefits of participation. To this end, students must be free to participate in the research voluntarily, and they should also have the freedom to withdraw from study at any time without any repercussions.

Moreover, researchers should ensure that the identification of participants and their academic performance details do not expose them to any stigma or bias resulting from their participation in this research. In addition, researchers should be conscious of the fair treatment of participants and must be aware that the introduction of brain-based learning practices will not lead to a disadvantage for students. Socio-economic status, learning disability, and language are important predictors of how students experience these instructional methods. Consequently, more enhancement is crucial for children to participate successfully in the program that employs the brain-based learning concept. Finally, researchers should utilize and report the results to enhance education and enrich practice, while also considering the implications of the illustrations. They should also positively apply these findings to patrols in order to enrich culturally relevant practice and ensure sufficient learning outcomes. Some of these ethical questions include the following: To ensure that all learners receive equal and high-quality resources for their learning, the current research can provide clear answers to these ethical questions.

Results and Discussion

The findings, analysis, and interpretation of the data collected in light of the research's challenges are briefly discussed in this chapter.

Problem No. 1: What is the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of engagement levels, progress monitoring, experience and satisfaction, and peer collaboration?

Table 1.1 presents the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of engagement levels.

It can be gleaned from the table that assessment of the respondents on the extent of the role of digital tools in technology-enhanced

reading remediation in improving literacy among Grade 7 students in terms of engagement levels is "Greatly Efficient" with a mean of 3.88. All the indicators are greatly efficient such as The use of digital technologies enables students in the seventh grade to access information that is both interactive and rich in multimedia, which makes reading more interesting and pleasurable for them (M=3.93); Students are able to maintain their interest and remain motivated to develop when they use digital platforms since these platforms often contain elements that give rapid feedback on reading exercises (M=3.89); The use of digital tools through discussion forums and shared projects may foster peer cooperation, which will increase student engagement by providing them with the opportunity to learn from one another (M=3.89); The use of digital technologies makes it possible for instructors and students to constantly communicate with one another, which enables teachers to provide students with individualized advice and assistance that helps students remain engaged in their reading journey (M=3.89); and The use of digital technologies by educators allows for the creation of individualized learning experiences that are tailored to the specific reading levels and interests of each student, so encouraging a higher degree of involvement in the students' literacy development (3.83).

Table 1.1. *Mean of the Respondents' Assessment on the Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation in Improving Literacy Among Grade 7 Students in terms of Engagement Levels*

	Indicators	*Mean*	*VI*
1.	The use of digital technologies enables students in the seventh grade to access information that is both interactive and rich in multimedia, which makes reading more interesting and pleasurable for them.	3.93	GE
2.	The use of digital technologies by educators allows for the creation of individualized learning experiences that are tailored to the specific reading levels and interests of each student, so encouraging a higher degree of involvement in the students' literacy development.	3.83	GE
3.	Students are able to maintain their interest and remain motivated to develop when they use digital platforms since these platforms often contain elements that give rapid feedback on reading exercises.	3.89	GE
4.	The use of digital tools through discussion forums and shared projects may foster peer cooperation, which will increase student engagement by providing them with the opportunity to learn from one another.	3.89	GE
5.	The use of digital technologies makes it possible for instructors and students to constantly communicate with one another, which enables teachers to provide students with individualized advice and assistance that helps students remain engaged in their reading journey.	3.89	GE
	Mean	3.88	GE

Legend: 3.26-4.00- Greatly Efficient; 2.51-3.25-Efficient; 1.76-2.50 –Slightly Efficient; 1.00-1.75 – Not Efficient

It may imply that the use of digital tools has been shown to greatly increase student engagement in reading activities. When students interact with multimedia content and gamified learning platforms, they are more likely to participate actively in their learning process. Consequently, this heightened engagement can lead to improved motivation, resulting in better literacy outcomes.

The finding goes with the study of Jasuli (2024) emphasized that the role of digital technology in improving literacy skills of primary school students is inseparable from utilizing digital devices and applications such as e-books, educational videos, learning apps and other interactive tools to enrich learning materials and support more engaging and effective teaching methods. These technologies can easily access various learning resources, realize personalized learning, and provide real-time feedback to comprehensively improve primary school students' reading, writing and information comprehension skills. The results show that digital technology provides wide access to various learning resources, such as e-books, educational videos, and interactive applications that can be customized to the individual needs of students.

Table 1.2 presents the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of progress monitoring.

Table 1.2. *Mean of the Respondents' Assessment on the Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation in Improving Literacy Among Grade 7 Students in terms of Progress Monitoring*

	Indicators	*Mean*	*VI*
1.	Teachers are able to gather data in real time on the reading habits of their pupils via the use of digital technologies, which assists them in more effectively identifying areas of growth and areas of improvement.	3.55	GE
2.	Teachers are able to develop individualized examinations by using digital tools that are in line with the specific requirements of each student, which enables more precise monitoring of the students' progress in reading skills.	3.63	GE
3.	Students are encouraged to create literacy objectives via the use of goal-setting capabilities that are often included in digital tools. This assists students in self-monitoring and reflecting on their own development.	3.51	GE
4.	Teachers are able to have conversations about the development of their students with the help of digital technologies, which enables them to conduct collaborative evaluations and share their thoughts, which ultimately leads to enhanced literacy results.	3.41	GE
5.	Teachers are able to monitor the levels of student involvement via the use of digital technologies, such as the amount of time spent on reading activities and participation rates. This helps teachers evaluate the degree of student motivation in addition to literacy abilities.	3.44	GE
	Mean	3.53	GE

Legend: 3.26-4.00- Greatly Efficient; 2.51-3.25-Efficient; 1.76-2.50 –Slightly Efficient; 1.00-1.75 – Not Efficient

It can be manifested from the table that assessment of the respondents on the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of progress monitoring is "Greatly Efficient" with a mean of 3.53. All the indicators are greatly efficient such as Teachers are able to develop individualized examinations by using digital tools that are in line with the specific requirements of each student, which enables more precise monitoring of the students' progress in reading skills (M=3.63); Teachers are able to gather data in real time on the reading habits of their pupils via the use of digital technologies, which assists them in more effectively identifying areas of growth and areas of improvement (M=3.55); Students are encouraged to create literacy objectives via the use of goal-setting capabilities that are often included in digital tools. This assists students in self-monitoring and reflecting on their own development (M=3.51); Teachers are able to monitor the levels of student involvement via the use of digital technologies, such as the amount of time spent on reading activities and participation rates. This helps teachers evaluate the degree of student motivation in addition to literacy abilities (M=3.44); and Teachers are able to have conversations about the development of their students with the help of digital technologies, which enables them to conduct collaborative evaluations and share their thoughts, which ultimately leads to enhanced literacy results (3.41).

It implies that the digital tools provide real-time data that educators can utilize to monitor students' progress effectively. This capability allows for timely interventions tailored to individual learning needs, ensuring that students receive the support necessary to enhance their reading skills. The efficiency of these tools enables teachers to track improvements and adjust instructional strategies as needed, fostering a responsive teaching approach.

The result is in parallel to the study of Geller (2022) said that progress monitoring is a process of collecting ongoing samples of student work and tracking performance of individual students over time. Progress monitoring involves administering parallel sets of items to the same student on a regular basis (at least monthly) that are sensitive to changes in the student's understanding based on instruction. The study demonstrated the value of using an adapted AIG process to facilitate rapid development of a progress monitoring system in mathematics. Content-related validity evidence supported the claims that both content and structure of the items were consistent across forms.

Table 1.3 presents the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of experience and satisfaction.

It can be associated from the table that assessment of the respondents on the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of experience and satisfaction is "Greatly Efficient" with a mean of 3.89. All the indicators are greatly efficient such as the use of digital platforms enables the provision of real-time feedback on reading activities, which assists students in rapidly comprehending their progress and in identifying areas in which they may develop, so increasing their overall pleasure (M=3.91); The use of digital technologies promotes students' pleasure of the learning process by facilitating cooperation via the use of discussion forums and group projects. This gives students the opportunity to share their perspectives and experiences with one another (M=3.90); The incorporation of multimedia components that capture the attention of students and make reading more pleasurable is one of the ways that digital technologies contribute to the creation of a more engaging learning environment (M=3.89); Digital tools often incorporate progress monitoring capabilities that visibly portray students' successes, increasing motivation and providing a feeling of fulfillment as they witness their development (M=3.89); and Teachers are able to make use of digital resources in order to carry out individualized reading interventions based on individual student evaluations, which ultimately results in a more enjoyable educational experience (3.85).

Table 1.3. Mean of the Respondents' Assessment on the Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation in Improving Literacy Among Grade 7 Students in terms of Experience and Satisfaction

	Indicators	*Mean*	*VI*
1.	The incorporation of multimedia components that capture the attention of students and make reading more pleasurable is one of the ways that digital technologies contribute to the creation of a more engaging learning environment.	3.89	GE
2.	Teachers are able to make use of digital resources in order to carry out individualized reading interventions based on individual student evaluations, which ultimately results in a more enjoyable educational experience.	3.85	GE
3.	The use of digital platforms enables the provision of real-time feedback on reading activities, which assists students in rapidly comprehending their progress and in identifying areas in which they may develop, so increasing their overall pleasure.	3.91	GE
4.	The use of digital technologies promotes students' pleasure of the learning process by facilitating cooperation via the use of discussion forums and group projects. This gives students the opportunity to share their perspectives and experiences with one another.	3.90	GE
5.	Digital tools often incorporate progress monitoring capabilities that visibly portray students' successes, increasing motivation and providing a feeling of fulfillment as they witness their development.	3.89	GE
	Mean	3.89	GE

Legend: 3.26-4.00- Greatly Efficient; 2.51-3.25-Efficient; 1.76-2.50 –Slightly Efficient; 1.00-1.75 – Not Efficient

It implies that the study indicates that students report higher levels of satisfaction when using technology for reading remediation. A positive user experience stems from the interactive and personalized nature of digital tools, which cater to various learning styles and

preferences. This satisfaction is crucial, as it encourages students to engage more deeply with reading materials and fosters a lifelong love for reading.

According to Taja-on (2023) said that the rise of technology has altered the way in which pupils acquire knowledge. The purpose of this research is to assess the general degree of digital literacy among students as well as their level of contentment with online education. Based on the findings of the research, it can be concluded that the learners' level of digital literacy is elementary. Moreover, the findings of the research indicate that the learners are most content with their contacts with other students, while they are the least content with their interactions with other teachers.

Table 1.4 presents the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of peer collaboration.

It can be manifested from the table that assessment of the respondents on the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of peer collaboration is "Greatly Efficient" with a mean of 3.70. All the indicators are greatly efficient such as the teachers have the ability to design reading challenges that require groups of students to work together in order to achieve shared literacy objectives. This encourages kids to work together while also promoting healthy competition (M=3.93); The use of digital technologies makes it possible for students to communicate with one another in a seamless manner, enabling them to debate learning materials, exchange ideas, and provide help to one another in real time (M=3.68); Students are held more accountable and are encouraged to establish objectives for their future reading habits when digital platforms generally offer tools that allow them to report on their collaborative experiences (M=3.68); Teachers may offer group reading assignments via digital platforms, enabling students to collaborate and build a feeling of community while also improving their comprehension of the book (M=3.61); and Students are able to readily exchange articles, e-books, and other resources with one another via the use of digital technologies, which assists in the promotion of collective learning and assists students in discovering varied viewpoints on reading materials (3.61).

Table 1.4. *Mean of the Respondents' Assessment on the Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation in Improving Literacy Among Grade 7 Students in terms of Peer Collaboration*

	Indicators	*Mean*	*VI*
1.	The use of digital technologies makes it possible for students to communicate with one another in a seamless manner, enabling them to debate learning materials, exchange ideas, and provide help to one another in real time.	3.68	GE
2.	Teachers may offer group reading assignments via digital platforms, enabling students to collaborate and build a feeling of community while also improving their comprehension of the book.	3.61	GE
3.	Students are able to readily exchange articles, e-books, and other resources with one another via the use of digital technologies, which assists in the promotion of collective learning and assists students in discovering varied viewpoints on reading materials.	3.58	GE
4.	Teachers have the ability to design reading challenges that require groups of students to work together in order to achieve shared literacy objectives. This encourages kids to work together while also promoting healthy competition.	3.93	GE
5.	Students are held more accountable and are encouraged to establish objectives for their future reading habits when digital platforms generally offer tools that allow them to report on their collaborative experiences.	3.68	GE
	Mean	3.70	GE

Legend: 3.26-4.00- Greatly Efficient; 2.51-3.25-Efficient; 1.76-2.50 –Slightly Efficient; 1.00-1.75 – Not Efficient

It implies that technology enhances opportunities for students to work together, share resources, and support each other's learning. Collaborative tools allow students to engage in discussions, provide feedback, and co-create projects, thereby fostering a sense of community and shared responsibility for learning.

According to Kwiatkowska (2022) it said that the greatest degree of group work is collaboration, when people solve an issue. Information and communication technology aids cooperation. As a participative, communicative instrument for collaboration and knowledge co-construction, digital technology may improve learning experiences. These results support the need to individualize teaching and learning and emphasize the need for digital competency for all learners. The appraisal may be affected by self-confidence, self-esteem, self-efficacy, social approbation, or personality.

Table 1.5 presents the summary of the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students.

As presented in the table on the summary of the extent of the role of digital tools in technology-enhanced reading remediation in improving literacy among Grade 7 students in terms of engagement levels (M=3.88); progress monitoring (M=3.53); experience and satisfaction (M=3.89); and peer collaboration (M=3.70). This was supported with an overall mean value of 3.75 interpreted as greatly efficient.

It implies that the implications of this study advocate for the continued integration of digital tools in literacy programs. Such integration can lead to meaningful improvements in student literacy outcomes while simultaneously preparing them for a technologically advanced

world. It suggests that these tools are not only beneficial but also significantly enhance the overall educational experience. Their capacity to engage students, monitor progress effectively, provide satisfying user experience, and foster collaboration underscores their role as essential components in modern literacy education.

Table 1.5. *Summary of the Mean of the Respondents' Assessment on the Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation in Improving Literacy Among Grade 7 Students*

Indicators	*Mean*	*VI*
engagement levels	3.88	GE
progress monitoring	3.53	GE
experience and satisfaction	3.89	GE
peer collaboration	3.70	GE
Mean	3.75	GE

Legend: 3.26-4.00- Greatly Efficient; 2.51-3.25-Efficient; 1.76-2.50 –Slightly Efficient; 1.00-1.75 – Not Efficient

This goes with the findings of Jasuli (2024) emphasized the role of digital technology in improving literacy skills of primary school students is inseparable from utilizing digital devices and applications such as e-books, educational videos, learning apps and other interactive tools to enrich learning materials and support more engaging and effective teaching methods. These technologies can easily access various learning resources, realize personalized learning, and provide real-time feedback to comprehensively improve primary school students' reading, writing and information comprehension skills. The results show that digital technology provides wide access to various learning resources, such as e-books, educational videos, and interactive applications that can be customized to the individual needs of students.

Problem No. 2: What is the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores?

Table 2 illustrates the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores.

Table 2. *Mean and Standard Deviation of the Level of Literacy Assessment Scores of Grade 7 Students Before and After the Utilization of Digital Tools in Technology-Enhanced Reading Remediation as Revealed by their Pretest and Posttest Scores*

Test	*N*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Pretest	80	5.00	15.00	10.6000	2.38455
Posttest	80	24.00	30.00	27.3625	1.35239

The results showed a notable improvement in the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores with a pretest mean of 10.60 and posttest mean of 27.3625. The notable increase implies that students are becoming more proficient in applying their vocabulary knowledge in context, thus fostering better communication skills in using digital tools in technology-enhanced reading remediation.

The significant improvement in literacy assessment scores of Grade 7 students after the implementation of digital tools for technology-enhanced reading remediation highlights the potential of these tools to transform educational outcomes. This positive shift not only demonstrates the effectiveness of integrating technology into reading instruction but also suggests that digital tools can engage students more actively, thereby fostering a deeper understanding of reading material.

The best results are produced by four types of competences, such as instructional delivery, classroom management, formative assessment, and personal competencies, according to studies on education practices that make a difference (Howe & Watson, 2021; Bozkus, 2021; Kasani, et al. 2020; Siri, et al. 2020). Furthermore, the research reveals that these competences might be utilized to organize the many different skills and knowledge needed for effective teacher growth (Hanushek et al., 2019).

Problem No. 3: Is there a significant difference on the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores?

Table 3 presents the significant difference on the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores.

The findings revealed that there is a significant difference on the level of literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation as revealed by their pretest and posttest scores, since the p-value is less than 0.05 level of significance, thus the null hypothesis is rejected, and it is found to be significant. The significant difference in literacy assessment scores of Grade 7 students before and after the utilization of digital tools in technology-enhanced reading remediation underscores the positive impact of these resources on student learning outcomes. This finding indicates that the integration of digital tools not only addresses reading deficiencies but also enhances overall engagement and motivation among students. As evidenced by the pretest and posttest scores, the effective use of technology in the classroom can lead to substantial

improvements in literacy skills, suggesting that schools should consider incorporating such innovative approaches into their curriculum to better support students' reading development and academic success.

Table 3. *Difference on the Level of Literacy Assessment Scores of Grade 7 Students Before and After the Utilization of Digital Tools in Technology-Enhanced Reading Remediation as Revealed by their Pretest and Posttest Scores*

Test	*Paired Differences*					*t*	*df*	*Sig. (2-tailed)*	*Decision Ho*	*Interpretation*
	Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*						
				Lower	*Upper*					
Pretest Posttest	-16.76250	3.23448	.36163	-17.4823	-16.0427	-46.353	79	.000	R	S

The study of Hock, et al (2020) examined various studies on the integration of technology in literacy instruction. The authors highlight how digital tools such as e-books, mobile applications, and online platforms facilitate differentiated instruction and engagement among students. They argue that technology can enhance reading comprehension, vocabulary development, and motivation, particularly in struggling readers. Also, Roskos (2020) synthesized findings from intervention studies focusing on digital tools designed to promote early literacy skills. The analysis reveals significant benefits in phonological awareness, print knowledge, and vocabulary acquisition when using interactive digital formats. Results indicate that students who utilized mobile applications to support their reading practice showed significant improvements in comprehension scores compared to those who followed traditional methods (Lai, 2020).

Problem No. 4: Is there a significant relationship between the extent of the role of digital tools in technology-enhanced reading remediation and the level of literacy assessment scores of Grade 7 students after the utilization of digital tools in technology-enhanced reading remediation as revealed by their posttest scores?

Table 4 presents the significant relationship between the extent of the role of digital tools in technology-enhanced reading remediation and the level of literacy assessment scores of Grade 7 students after the utilization of digital tools in technology-enhanced reading remediation as revealed by their posttest scores.

Table 4. *Relationship Between the Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation and the Level of Literacy Assessment Scores of Grade 7 Students After the Utilization of Digital Tools in Technology-Enhanced Reading Remediation as Revealed by their Posttest Scores*

Extent of the Role of Digital Tools in Technology-Enhanced Reading Remediation	*Test*	*Pearson r*	*Sig*	*Ho*	*VI*
Role of Digital Tools	Posttest	-1.91	.050	R	S

Legend: FR-Failed to Reject; R-Rejected; NS-Not Significant; S-Significant

The findings revealed that there is significant relationship between the extent of the role of digital tools in technology-enhanced reading remediation and the level of literacy assessment scores of Grade 7 students after the utilization of digital tools in technology-enhanced reading remediation as revealed by their posttest scores since the p-value is less than 0.05 level of significance, thus the null hypothesis is rejected, and it is found to be significant.

The observed relationship between the extent of the role of digital tools in technology-enhanced reading remediation and the level of literacy assessment scores of Grade 7 students suggests that a greater integration of these tools correlates with higher posttest scores. This finding implies that the effectiveness of reading remediation programs may be significantly influenced by the degree to which educators utilize digital resources in their instruction. Consequently, it highlights the importance of not only adopting technology but also maximizing its potential through strategic implementation to further enhance student literacy outcomes. As such, educational stakeholders should focus on providing training and support for teachers to effectively integrate digital tools into their teaching practices, thereby promoting improved literacy skills among students.

According to the study of Kucirkova (2021) investigated the effects of personalized digital reading experiences on children's literacy development. The authors argue that digital tools allow for greater customization of reading materials, catering to individual interests and reading levels. Findings suggest that personalized reading experiences can lead to increased motivation and engagement, ultimately enhancing literacy outcomes among young readers. Further, Jang (2021) examined the effectiveness of multimedia presentations in teaching reading skills to struggling students. The findings indicate that integrating visual and auditory elements enhances students' understanding and retention of reading materials.

Conclusions

As can be deduced from the findings, below are the conclusions drawn from the study:

Digital tools in technology-enhanced reading remediation are greatly efficient in improving the literacy among Grade 7 students in terms of engagement levels, progress monitoring, experience and satisfaction, and peer collaboration.

Student literacy assessment scores have greatly increased after the utilization of digital tools in technology-enhanced reading

remediation.

Grade 7 students' pretest and posttest scores show substantial differences utilizing the digital tools in technology-enhanced reading remediation.

The literacy assessment scores of Grade 7 students significantly influenced by the utilization of digital resources in their instruction.

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