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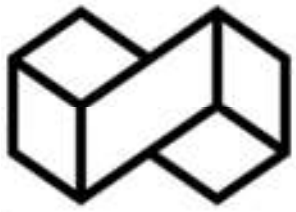

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2. To support academicians and teachers in creating work beneficial to the academic community
3. To stimulate and support education at the university level

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Editorial Note

The Interdisciplinary Research Review (IRR) was established with academic cooperation by The Royal Society of Thailand Committee of Interdisciplinary Research and Development, Rajabhat University (Western Group), and Rajamangala University of Technology Rattanakosin. This Issue, Volume 20, No. 6, November – December 2025. This issue contains of three interesting articles in multidisciplinary fields: (1) Exploring Teachers' Preparedness and Attitudes Toward Multimedia-Based Reading Instruction,(2) Effects of Mobile Phone Signal Density on Communication:A Case Study at Thammasat Secondary School , (3) Exploring ChatGPT's Role in English Language Learning: Insights from Pre-Service Teachers,(4) Sailing to success: A probabilistic analysis of factors influencing to pass the Licensure Examination for Fisheries Technologists.

The Editorial Board of the IRR encourages anyone to submit articles for evaluation and review. The processes of submission, review and publication of articles are described on the journal's website, https://www.tci-thaijo.org/index.php/jtir. The Editorial Board and Committees of the IRR sincerely thank all peer reviewers who have sacrificed their time to help us produce a better journal, and also wish to thank all teachers, researchers and other academicians for submitting their valuable research to this journal. Finally, we thank readers of our journal who help to spread the knowledge and benefits gained to others. With your feedback and suggestions, we will strive to improve the quality and relevance of the IRR.

Yongyudh Vajaradul
Editor
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Exploring Teachers' Preparedness and Attitudes Toward Multimedia-Based Reading Instruction

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Abstract

This study examined the preparedness and attitudes of junior high school teachers in private schools in Cebu, Philippines, in integrating multimedia-based reading instruction. As new media technologies continue to transform classroom practices, understanding how teachers adopt and apply multimedia tools in reading lessons has become increasingly important. Thirty-one junior high school reading teachers selected through purposive sampling participated in the study. Data were collected through a validated researcher-made questionnaire consisting of items measuring teachers' preparedness, attitudes, and perceived factors influencing multimedia integration. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to analyze the data. Results show that teachers demonstrate a high level of preparedness and confidence in using multimedia tools to enhance student engagement, comprehension, and motivation. They also hold positive attitudes toward multimedia as a means of enriching reading instruction and supporting diverse learners. However, several challenges were identified, particularly limited access to functional devices, insufficient professional development, and inconsistent technical support. These barriers hinder the optimal use of multimedia tools in reading instruction. Overall, the findings highlight the need for sustained professional development, improved access to technological resources, and stronger institutional support to maximize the potential of multimedia-based reading instruction in improving students' reading performance.

Keywords: *Attitudes, Integration, Multimedia tools, Preparedness, Reading instruction*

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1. Introduction

Conventional reading approaches, which are based on printed material, represent a steady basis of reading education. But in an age of shrinking attention spans and digital natives, such techniques often don't resonate with students as deeply as we would like. It is when students are unable to retain attention and fail to create deeper associations with the content that the shortcomings of conventional methods become clear [1]. Hence, instructors are looking for new ways to create more understanding and interaction. One of these solutions is the use of multimedia tools, which allow for the combination of multiple types of digital content in order to augment the learning process. This shift reflects global educational trends emphasizing multimodal literacy and digital engagement [2, 3, 4]. As noted in recent literature, the move toward multimedia-based reading instruction (MBRI) responds to the need to adapt reading pedagogy to students who learn best through visual, auditory, and interactive formats rather than text alone.

The use of multimedia in reading instruction is becoming increasingly acknowledged as

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beneficial for improving students' comprehension, engagement, and motivation. Likewise, multimedia reading tools may use interactive e-books, educational applications and platforms with gamification inclusion. These devices help students engage with the contents dynamically which will encourage greater comprehension, contribute to better retention [5]. It was found that gamified reading platforms significantly enhance learners' motivation and comprehension [6], while it was emphasized that digital media production technologies broaden learners' exposure to cultural and informational content, enriching reading experiences in media-rich contexts [7]. Incorporating visuals, audio, and interactive elements into text-based learning increases teachers' confidence while enhancing multimedia implementation in the classroom, particularly in text-based learning, which supports more profound literacy development [8]. In addition, empirical studies have found that multimedia—scaffolding in associating texts with related visuals and sounds can help learners build mental models effectively, enhance critical thinking, and improve their ability to remember information [5]. By accommodating learning preferences and minimizing cognitive demand through dual coding [9], the multimedia reading approach has become a pedagogical necessity, exceeding the conventional text-alone method in modern literacy education [1]. Similarly, [10] confirmed that multimedia-supported reading instruction effectively enhances reading comprehension among Filipino middle school students when paired with strong teacher guidance, highlighting the synergy between technology and pedagogy in literacy development.

Yet, while the benefits are well-documented, research has shown some challenges in bridging the gap between the theory of multimedia-oriented instruction and the reality of multimedia-rich instruction. Teachers often feel unskilled or lack training to integrate multimedia tools effectively and informatively [11]. In the Philippine setting, specifically among public and private junior high school teachers, limited access to digital infrastructure and a lack of continuous professional development contributed to the challenge. This is supported by a study [12], that found that although Filipino teachers value multimedia integration, many are not sufficiently equipped with the digital literacy and resources needed to implement it effectively. Likewise, another study [13] emphasized the importance of staff development and technical support in ensuring the successful application of multimedia-based reading instruction in Philippine classrooms.

Teachers do not only experience difficulties in choosing appropriate multimedia resources, but also face problems in integrating multimedia resources that are aligned with the curriculum's objectives and in dealing with technology-based classroom situations [14]. This aligns with the observations of [15], who argued that while the integration of technology into the Philippine curriculum enhances learning outcomes, its implementation requires consistent teacher training and institutional guidance.

In addition to technical capability, attitudinal barriers play a crucial role in the integration process. Instructors may experience apprehension due to a lack of familiarity with new and emerging technologies, leading them to be anxious about the pressure of content creation, or may also be afraid of losing control of instruction [16]. This finding resonates with [17] and [18], who reported that teachers' negative perceptions toward multimedia often stem from limited training, unreliable internet connections, and fears of classroom implementation errors.

Such psychological barriers could limit the depth and reach of the multimedia use even in the presence of available multimedia content. Furthermore, researchers [19, 20] stated that teachers' perceived preparedness significantly determines the chance, influencing their decision to implement innovative pedagogies. In contrast, studies such as [21, 22] highlight

that when teachers hold positive attitudes toward multimedia tools, they experience improved classroom dynamics, greater student engagement, and higher academic performance. These contrasting findings underscore the importance of preparedness and attitude as dual determinants of successful multimedia-based reading instruction.

This paper focuses on investigating the level and relationship of preparedness and attitudes of junior high school teachers in private schools in the Philippines toward the utilization of multimedia-based reading instruction in the classroom. It examines the factors affecting the influence of using multimedia, including age, gender, teaching experience, and access to technology. This study is anchored on the premise that the implementation of multimedia-based reading instructions in the classroom has substantial potential for refining students' reading skills; however, its effectiveness depends on teachers' preparedness and attitudes in integrating technological tools. Thus, an in-depth analysis of the relationship between teachers' preparedness and attitude in mitigating students' reading difficulties, providing a clear picture of how these variables are interconnected. This study shares valuable insights beneficial for teachers, education stakeholders, and policymakers in developing professional development programs about the integration of multimedia-based instruction. Curriculum alignment and time management have also been identified in previous studies as factors influencing teachers' capacity to integrate multimedia in reading instruction.

1.1 Problem Objectives

This study determines teachers' preparedness and attitudes toward the use of multimedia tools in the teaching of reading. Specifically, it seeks to identify the following:

1. Teachers' preparedness in multimedia-based reading instruction.
2. Teachers' attitudes in the use of multimedia tools in reading instruction.
3. Perceived factors affecting their preparedness and attitudes.

2. Methodology

2.1 Research Design

This study utilized the descriptive quantitative research design to examine the teachers' preparedness and attitudes towards multimedia-based reading instruction. The data collection tool being used was a survey questionnaire, which was distributed to secondary school teachers in private schools who are involved in teaching reading.

2.2. Research Instrument

The instrument used was a validated survey questionnaire to get the necessary data relevant to the study. The instrument consisted of three parts: (1) items measuring teachers' preparedness in multimedia-based reading instruction, (2) items assessing teachers' attitudes toward the use of multimedia tools, and (3) items identifying perceived factors influencing their preparedness. All items were rated on a four-point Likert scale. The third part of the instrument specifically measured the perceived factors affecting teachers' preparedness and attitudes. This section included items clustered under access to resources, professional development, curriculum integration, technical support, and time-related concerns. These categories were developed based on recent literature on multimedia-based reading instruction.

2.3 Research Participants

The respondents were purposely selected and identified as reading teachers in private institutions in Cebu. The 'reading teachers' in the context of this study are those who have been teaching reading with or without the use of multimedia tools in a formal setting. Thirty-one teachers answered the survey, and they are dominantly young (20-30 years old), female, and have a short service of 1-5 years of teaching experience. All are Bachelor's degree holders, dominantly in Language Education. While most had

attended training related to reading instruction, which supported their professional development, nearly 40% had not participated in such training. The respondents' schools generally support the use of computers, the Internet, and educational software; however, access to tablets and e-boards was neither funded by the government nor by the institution.

2.4 Data-gathering Procedure

Prior to the actual collection of data, the researcher sought approval for the study. Upon obtaining consent, copies of the questionnaires were distributed to the selected teachers who are handling reading classes with or without the use of multimedia tools. After the retrieval of the questionnaires, data tabulation followed for statistical treatment to identify the teachers' attitudes and level of preparedness in using multimedia integration for reading instructions to Junior High Schools in private schools. The data were then analyzed, and interpreted. Moreover, short follow-up interviews were conducted with selected participants (coded as R1, R2…) to validate certain responses.

2.5 Data Analysis

Data were analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation. Weighted mean scores were computed to determine the overall trends and interpret teachers' levels of preparedness, attitudes, and perceived factors affecting multimedia-based reading instruction. Descriptive thematic notes from validation interviews were also considered to contextualize quantitative responses.

3. Results and Discussion

3.1. Teachers' Preparedness in Integrating Multimedia Tools for Reading Instruction

Teachers' preparedness in the integration of multimedia tools in reading instructions is paramount. Preparing teachers to espouse and understand that digital resources are prevalent in education is essential.

Table 1. Teacher's preparedness in integrating multimedia tools.

Item	Mean	Interpretation
Using multimedia tools would significantly improve my students' reading comprehension or engagement.	3.54	SA
I am ready to use multimedia tools to present reading content in new and effective ways that cater to diverse learners.	3.54	SA
I am confident that I can effectively teach reading when using multimedia tools.	3.45	A
I am confident in integrating multimedia tools to meet specific reading objectives in my classroom.	3.45	A
Learning to use new multimedia tools specifically for reading instruction is easy for me.	3.35	A
My school has supported the use of multimedia tools (e.g., educational videos, interactive stories, audiobooks) to enhance reading instruction.	3.29	A
My interaction with multimedia tools for reading instruction (e.g., navigating online reading platforms, playing educational videos) is clear and understandable.	3.29	A
I am ready to design reading lessons that effectively integrate multimedia tools (e.g., videos, audio, interactive texts) to enhance student learning.	3.2	A
I am confident in my ability to modify my reading teaching approaches to effectively use multimedia resources.	3.29	A
I perceive that there is sufficient access to appropriate multimedia tools (e.g., functional devices, internet connectivity for online resources) for reading instruction.	3.23	A
Total	3.37	A

Legend: 3.50-4.00= Strongly Agree; 2.50–3.49 = Agree; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree

This aligns with [2, 3], who noted that the success of multimedia-based instruction depends largely on teachers' preparedness to adopt technology, as it enhances comprehension through interactive and multimodal learning experiences. The data reflect teachers' level of preparedness toward multimedia-based reading instruction. These are systematized from the highest to the lowest weighted mean, resulting in the interpretation of the gathered data.

The first statement that gained the highest weighted mean (WM = 3.54) is, *"Using multimedia tools would significantly improve my students' reading comprehension or engagement,"* noting a strong agreement from the selected respondents. Moreover, the second statement conferred (WM = 3.54) is *"I am ready to use multimedia tools to present reading content in new and effective ways that cater to diverse learners,"* denoting that preparedness among teachers is procured in integrating innovative and extensive teaching approaches in multimedia. Notably, this entails that confidence and enthusiasm leveraging multimedia tools are elevated and primed to espouse diverse instructional approaches to ameliorate students' learning in reading. Similarly, [6] and [7] found that students exhibited higher engagement and comprehension levels when teachers implemented gamified and multimedia-rich reading activities, underscoring the link between teacher preparedness and student motivation.

Conversely, the last two statements are the lowest on account of relatively limited access to multimedia and school support. This limitation echoes the findings of [12] that reported that Filipino teachers recognize the importance of multimedia but often lack sufficient training and infrastructure to apply it effectively. The lowest statement procures a WM = 3.23, *"I perceive that there is sufficient access to appropriate multimedia tools (e.g., functional devices, internet connectivity for online resources) for reading instruction"***,** construed as Agree (A), but prominently lower in contrast. In addition, the second statement that fairly gained a weighted mean WM = 3.29, appraised an Agree (A) *"I am confident in my ability to modify my reading teaching approaches to effectively use multimedia resources"*. This entails that while teachers are fairly confident in modifying their teaching strategies to accommodate multimedia use, their ability to fully implement such approaches may be relatively constrained by external limitations, particularly in terms of technological resources and institutional support.

A substantial response from the respondents for reading instructions that entail the need for enhanced access and training in multimedia tools is affirmed. This highlights the eminent importance of stable devices and multimedia materials for adept learning outcomes. Consistent with [10, 13], continuous professional development and guided assistance are critical in ensuring that multimedia integration leads to improved reading comprehension outcomes among students. The teacher-respondents when interviewed (R1, R5, R20, and R29) asserted that functional devices and stable internet availability are required. As highlighted in R2, R11, and R25, premium accounts for educational sites and apps were quoted as an advantage for student engagement.

Moreover, professional development and intensive training that addresses effective integration of multimedia tools are accentuated in R1, R3, R6, R12, R27, and R31, sequentially, organized action plans, insinuated strategies and readily accessible, curriculum-aligned multimedia materials are what the teacher is hankering for. Significantly, R7 and R18 mentioned that it is greatly beneficial for schools to have support in multimedia tools.

All in all, multimedia tools amplify the eagerness and preparedness of the Filipino teachers in students' reading comprehension. They firmly deem the advantages; however, a prominent challenge persists, such as inadequate access to devices, stable internet, and insufficient training. Concurrently, teachers are hindered by limited resources to fully acclimate their capacity to incorporate multimedia. As effective multimedia use requires thoughtful pedagogical adjustments that integrate visuals and sounds meaningfully with text to support multimodal reading [23]. Continuous learning among teachers and multimedia investment in reading instruction are pivotal. Although the overall mean for preparedness was interpreted as "Agree," the lowest-rated items reveal important weaknesses. In particular, limited access to multimedia tools (WM = 3.23) and inconsistent school support (WM = 3.29) indicate areas where teachers feel less empowered. These lower values highlight structural barriers that may hinder full multimedia integration despite teachers' positive dispositions.

3.2. Teachers' Attitudes in Integrating Multimedia Tools for Reading Instruction

The inclusion of multimedia materials in reading activities is increasingly important in fostering student interest and achievement in reading. With respect to the integration of media into the classroom, educators play a crucial function; teachers' attitudes regarding multimedia use in the classroom exert a significant influence. This positive attitude corresponds to findings by [21] and [24], who emphasized that teachers' confidence and enthusiasm toward digital tools significantly enhance students' participation and comprehension.

Table 2. Teachers' attitudes in integrating multimedia tools for reading instruction.

Item	Mean	Interpretation
I am in favor of integrating multimedia tools (e.g., text, audio, video, images, animation, annotation, 3-D) as an essential part of the reading curriculum.	3.61	A
I am willing to improve my skills in using multimedia tools for better reading instruction.	3.61	A
I am confident that my students benefit from using multimedia tools in reading activities.	3.48	A
Integrating multimedia tools enhances the quality of the reading teaching and learning process.	3.45	A
Multimedia tools help me deliver reading lessons more effectively and efficiently.	3.29	A
Traditional tools are more effective than multimedia tools as teaching methods for reading instruction.	3.26	A
I think multimedia tools are suitable for the reading level of most of my students.	3.16	A
I believe that using multimedia tools in reading instruction does not create more distractions than benefits.	2.84	A
I find it easy to integrate multimedia tools into my lesson plans due to the support or training.	2.74	A
I feel confident when I am required to use multiple multimedia formats in my teaching.	1.90	D
Average	3.13	A

Legend: 3.50-4.00= Strongly Agree; 2.50–3.49 = Agree; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree

The data presents teachers' attitudes on the use of multimedia tools in reading instruction. It focuses on the positive and negative factors influencing their preparedness and confidence in terms of utilizing such tools in teaching sessions. Among the ten statements regarding Teachers' Attitudes in Integrating Multimedia Tools, *"I am in favor of integrating multimedia tools (e.g., text, audio, video, images, animation, annotation, 3-D) as an essential part of the reading curriculum."* and *"I am willing to upgrade my skills level to enable the use of multimedia tools for better reading instruction"* were ranked first with a weighted mean of 3.61, suggestive of strong agreement from the respondents, respectively. This indicates that most teachers are favorable for integrating multimedia tools in reading lessons, and are also prepared to develop their competence for more effective utilization of these tools in teaching.

Similarly,[2] and [22] revealed that the integration of digital storybooks, reading apps, and interactive videos fosters motivation and academic improvement among learners. On the other hand, the bottom two statements were, *"I feel confident when I am required to use multiple multimedia formats in my teaching."* and *"I find it easy to integrate multimedia tools into my lesson plans due to the support or training,"* with weighted means of 1.90 and 2.74, respectively, indicating a significant amount of lack of confidence and agreement. This suggests that teachers either lack confidence in their understanding and ability to use various multimedia formats in teaching,/or that they do not feel they are adequately supported or trained to incorporate such tools into their teaching. Studies found that teachers with limited training and weak internet access often exhibit hesitation in multimedia use [17, 18], mirroring the challenges reported by participants in this study Results such as these indicate a significant deficiency in teacher professional training, thereby highlighting the need for feasible and ongoing scaffolding to improve teachers' skills and confidence in the integration of multimedia approaches within their practice. Notably, the lowest mean score (WM = 1.90) shows teachers' lack of confidence when required to use multiple multimedia formats. This weakness suggests insufficient training and indicates that despite generally positive attitudes, teachers still require capacity-building to handle more complex multimedia tasks effectively.

Most notably, the data demonstrate teachers' enthusiasm for using multimedia in teaching reading and their interest in becoming more proficient in their use of technology in reading. But the results also reveal major challenges when it comes to teachers' comfort in utilizing multiple multimedia types and inadequacies in training and support. Researchers also cautioned that excessive reliance on audiovisual materials may cause students to depend on visuals rather than engaging deeply with written text, affecting comprehension development [25, 26]. These findings suggest the necessity of continuing professional development, improved access to resources, and clear guidance to enable teachers to integrate multimedia tools meaningfully into their teaching.

3.3. Factors Affecting Teachers' Preparedness and Attitudes in Implementing Multimedia-Based Reading Instruction

Teachers play an important role in this implementation because their preparedness and attitudes depend on the effectiveness of the adopted multimedia tools in the classroom for reading instruction. This study investigates the teachers' preparedness and attitudes toward multimedia-based reading instruction, highlighting key factors that support or hinder the effective use from the review of related literature. Illustrated in the table below are the factors affecting the implementation, such as time constraints, access to resources, personal development, technical support, and curriculum integration.

Table 3. Factors affecting teachers' preparedness and attitudes in implementing multimedia-based reading instruction.

No.	Item	Mean	Interpretation
	A. Access to Resources		
1	I feel that the availability of educational software and applications in my school will help me integrate multimedia tools into reading instruction effectively.	3.58	SA
2	I believe that having access to digital books and interactive platforms will enhance my preparedness to use multimedia tools in reading lessons.	3.58	SA
3	I believe that with stable internet connection and functional multimedia devices, I will be better equipped to integrate multimedia tools in my reading lessons.	3.55	SA
4	I believe that with available resources like laptops, computers, and internet connectivity, I will be ready to use multimedia tools in the teaching of reading.	3.52	SA
	Average	3.56	SA
	B. Professional Development		
5	I believe that attending training or workshops related to multimedia tools will enhance my ability to integrate these tools into my reading instruction.	3.81	SA
6	I feel that additional professional development in multimedia-based instruction would improve my confidence in using multimedia tools for reading lessons.	3.65	SA
7	I believe that training in specific multimedia tools for reading will help me better address diverse learning needs in my classroom.	3.65	SA
8	I am unsure in using multimedia tools due to a lack of professional development.	3.16	D
9	I do not have the necessary training/skills in using multimedia tools for reading instruction.	2.06	D
	Average	3.07	A
	C. Curriculum Integration		
10	The new educational curriculum encourages me to use multimedia tools in reading classes.	3.36	A
11	It helps me to tailor diverse learning needs of my students in the reading classroom.	3.29	A
12	Multimedia integration improves the curriculum implementation in reading instruction.	3.19	A
13	I believe not all reading lessons need multimedia tools because it is difficult to align.	2.58	A
14	I find difficulty in finding specific multimedia tools that match my reading objectives.	2.52	A
	Average	2.99	A
	D. Technical Support		
15	I believe that with my current skills, I am capable of troubleshooting basic technical issues related to multimedia tools in reading instruction.	3.00	A
16	I can directly ask my school for assistance when I face technical challenges.	2.90	A

No.	Item	Mean	Interpretation
17	Unforeseen technical issues often interrupt my multimedia-based reading lessons.	2.74	A
18	I am confident in troubleshooting basic technical problems on my own.	2.74	A
19	I seek assistance from my students when I encounter problems with multimedia tools.	2.32	D
20	Insufficient technical support discourages me from implementing multimedia-based reading instruction.	2.06	D
	Average	2.63	A
	E. Time Constraints		
21	I can handle my teaching time effectively even when using multimedia tools.	3.19	A
22	I find it challenging to spare ample time learning new multimedia tools for reading.	2.32	D
23	I feel burdened with multimedia preparations due to my heavy workload.	2.23	D
24	I cannot fully implement multimedia tools in my lessons due to insufficient time.	2.06	D
25	I prefer traditional methods because multimedia tools are time-consuming.	2.00	D
	Average	2.36	D
	Overall Average	2.88	A

Legend: 3.50-4.00= Strongly Agree; 2.50–3.49 = Agree; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree

The data shows a comprehensive overview of the factors, positive and negative, that affect teachers' preparedness and attitudes toward integrating multimedia tools in reading lessons.

Among the five factors as mentioned in the review of related literature, Access to Resources got the first rank (WM = 3.56) as the most influential factor in implementing the aforementioned teaching pedagogy for reading. These statements, *"I feel that the availability of educational software and applications in my school will help me integrate multimedia tools into reading instruction effectively."* and *"I believe that having access to digital books and interactive platforms will enhance my preparedness to use multimedia tools in reading lessons."* alongside it gained 3.58 resulting in strong agreement from the respondents, respectively. This entails that having access to applications, educational software, digital books, and other interactive factors will enhance teachers' preparedness and attitudes toward multimedia-based reading instruction. The importance of providing stable connectivity and digital devices resonates with [27, 28, 29], who noted that inadequate infrastructure in schools undermines teachers' preparedness for technology-based instruction.

R3 and R11 point out the advantages of *"premium user access to software applications and educational sites, applications, and software to access more resources"* without any limitations. R1, R22, R29, and R31 point out the "*necessity of access to the e-library to the age-appropriate multimedia materials, fun reading videos, apps, and a wider variety of multimedia resources"*. Moreover, R8 highlights "*the benefit of the school-paid online media"* that caters to diverse learning and reading materials. R25 and R27 also mentioned the "*access to premium accounts and tools provided freely by the school*," and R12 mentions that *"student access to these tools is crucial*."

Notwithstanding, Professional Development (WM = 3.07) of teachers follows as the second leading factor influencing the effectiveness of multimedia-based reading instruction in the classroom, which shows a positive outlook. The statement that gains the highest

weighted mean (3.81) for this is, *"I believe that attending training or workshops related to multimedia tools will enhance my ability to integrate these tools into my reading instruction."* This purports that teachers recognized the significance of personal development to improve their confidence level and capability to fully implement multimedia tools in the classroom for reading instruction.

R1 shares that *"training on how to use new tools effectively would also make integration smoother and more meaningful."* R3 points out the necessity of having an *"up-to-date training and organized action plan of appropriate multimedia tools for each reading lesson,"* along with R6, that such training *would be very beneficial"* with a strong and stable internet connection. Furthermore, R15 points out the importance of *"intensive seminars and training,"* particularly for multimedia-based reading implementation. R27 strongly suggests that *"professional training"* as a key factor can really improve teachers' skills and confidence for effective reading instruction.

This finding parallels [13] and [30], emphasizing that sustained training and capacity-building programs significantly strengthen teachers' multimedia competence and confidence. Furthermore, next in rank is the Curriculum Integration (WM = 2.99) factor, which shows that multimedia resources can align with the curriculum framework to enrich reading instruction. However, some teachers still struggle to find varied and accurate tools that can tailor to the learning objectives. The statement under this category, *"The new educational curriculum encourages me to use multimedia tools in reading classes,"* gained the highest weighted mean (WM = 3.36), suggesting a fair agreement with the statement compared to the first two factors. This implies that teachers are not confident enough in implementing multimedia tools to align with the target competencies. As [15] and [32] pointed out, technology integration within curriculum frameworks modernizes instructional practices and aligns them with 21st-century learning outcomes.

In contrast, the second least influential factor is Technical Support (WM = 2.63), suggesting a moderate level of agreement among all the other factors. The statement that received the highest weighted mean (WM = 3.00) recorded was, *"I believe that with my current skills, I am capable of troubleshooting basic technical issues related to multimedia tools in reading instruction,"* pointing out that most teachers nowadays are multimedia literate individuals. Teachers already know the fundamental technology skills, such as basic troubleshooting. Teachers' moderate ability to troubleshoot technical issues mirrors [33] findings that pre-service teachers' ICT literacy and confidence improve with exposure and guided practice. It is possible that these skills were largely strengthened during the COVID-19 pandemic due to the shift to online classes to ensure education continuity amid the global pandemic. Many respondents show that they know basic technical issues related to multimedia-based reading instruction. R2 mentioned that she can handle typical technical problems; however, when they are beyond her control, she would have difficulty with them. R6 also points out the use of *"PowerPoint, video clips, Canva, and Google Docs*

regularly," and R20 supports the integration of *"voice recorders and clips"* in the classroom during reading lessons, suggesting familiarity with basic troubleshooting. Moreover, R20 purports that they can *"always ask their IT staff when technical issues arise,"* entailing a strong support system rather than technical support. Moreover, some tools that are easier for teachers to manipulate are *"interactive e-books (R1 & R28), audio recordings (R1), animated read-aloud videos (R22 & R28), Kahoot (R2 & R25), Raz-Kids (R2), podcasts (R6), Canva (R6), and YouTube videos (R6 & R22)."* This explains why technical support is not a problem that can hinder their implementation of multimedia-based reading instruction.

Finally, the lowest part is the Time Constraints (WM = 2.36), highlighting that time is not a factor that can hinder teachers' preparedness and attitudes. Since most items under the Time Constraints factor were negatively stated, the 'Disagree' interpretation indicates that teachers do not perceive time limitations as a major barrier. The statement that receives the highest weighted mean of 3.19, *"I can handle my teaching time effectively even when using multimedia tools,"* suggests a strong outlook on the respondents' responses that they can integrate it effectively regardless of their teaching time. This supports the idea that time is not the biggest factor for our respondents. R13 highlights that using multimedia tools can make the teaching process become *"convenient and efficient,"* and R21 supports that it can make lesson delivery *"simpler and easier,"* which means that it does not consume a lot of time when implementing it. R25 suggests that multimedia is a *"crucial tool"* that can improve student learning and teacher delivery for reading lessons into classroom routines. R25 comments that multimedia tools can *"gauge students' interest,"* leading to a *more convenient and interactive learning (R16).* This indicates that multimedia tools are manageable within the teaching hours and can optimize teaching time.

This corresponds with insights from [31], indicating that while teachers are generally open to innovation, competing workloads and lack of time often restrict effective multimedia preparation. Overall, the findings reveal that teachers are generally ready and have a positive outlook on multimedia-based reading instruction. With the gathered data, Access to Resources is the chief factor that can affect teachers' preparedness and attitudes toward multimedia-based reading instruction in the classroom. It highlights the necessity of educational software, school-provided tools, and digital books. Professional Development follows, suggesting the importance of training to enhance teachers' confidence level and technical skills. Although the Curriculum Integration factor shows a moderate agreement, it has great potential for aligning it with the current changes in the DepEd curriculum. On the other hand, Technical Support and Time Constraints received the lowest, meaning they cannot negatively affect their teaching when integrating multimedia tools in reading classes. Most teachers are capable of doing basic troubleshooting and managing their time well. Therefore, integrating multimedia tools in reading classes can be perceived as practical, engaging, and supportive in the modern classroom.

4. Conclusion and Recommendations

The study concludes that teachers demonstrate a high level of preparedness and positive attitudes toward the integration of multimedia tools in reading instruction. Respondents perceived multimedia as effective in enhancing students' engagement, comprehension, and motivation, indicating strong willingness and ability to use these tools when adequate resources and support are available. Results also highlight several key factors influencing teachers' preparedness and attitudes, particularly access to functional devices, availability of professional development, curriculum alignment, and technical support. Although time constraints were reported, they did not significantly hinder teachers' use of multimedia resources, as reflected in the lowest mean scores for this factor. Furthermore, teachers expressed high confidence in integrating basic multimedia tools, though confidence varied when tasks required the use of multiple or more advanced formats, often depending on their training and experience.

Respondents also recommended improving access to multimedia devices, premium digital platforms, and stable internet connectivity. They emphasized the need for regular hands-on training, updated digital resources aligned with instructional requirements, and reliable technical assistance to support the consistent use of multimedia tools in reading instruction. Ensuring these conditions may help strengthen teachers' multimedia integration practices and contribute to more engaging and effective reading lessons.

Future research may explore classroom-based observations to validate self-reported levels of preparedness and attitudes, compare practices across different school settings, or design and test multimedia-based reading intervention models. Longitudinal studies may also be conducted to examine how continuous professional development influences teachers' preparedness, confidence, and instructional outcomes over time.

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Effects of Mobile Phone Signal Density on Communication: A Case Study at Thammasat Secondary School

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Abstract

This study compares the performance of Wi-Fi and 5G networks at Thammasat Secondary School, focusing on areas with high user density, such as classrooms, cafeterias, and sports fields. Signal quality was evaluated using the nPerf application, which measured key metrics, including download speed, upload speed, and latency during peak usage times.Data were collected at three different times of the day: morning, midday, and afternoon. The findings reveal that Wi-Fi outperforms 5G in terms of consistent download and upload speeds and lower latency in high-density regions. In contrast, 5G networks demonstrated higher speed fluctuations and increased latency, especially during peak usage times. This study suggests upgrading the school's network infrastructure, including the potential adoption of Wi-Fi 6 technology or a hybrid Wi-Fi/5G model, to improve overall performance, particularly in areas with high user congestion. Such improvements could support more reliable and efficient online learning activities and real-time communication within the school environment. Further research is recommended to explore the effects of network upgrades under varying conditions and over extended time periods.

Keywords: Wi-Fi, 5G, Network Density, Educational Networks, Latency, Throughput

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1. Introduction

The development of wireless communication technologies has influenced daily life in many ways, particularly in the field of education. Mobile phones and Internet access are now common tools that support both classroom learning and online education [1]. Alongside this trend, Wi-Fi and 5G technologies have been introduced to provide higher speed and efficiency to meet the increasing demand for data transmission [2, 3].

However, the concentration of users within limited areas, such as schools and universities, can lead to network congestion. This problem may reduce the quality of communication through slower download and upload speeds, higher latency, and interruptions during use [4]. Such issues are relevant in educational contexts, where reliable networks are important for learning and teaching [5].

Thammasat Secondary School makes extensive use of wireless networks for academic purposes. Teachers and students rely on mobile devices and computers to access online learning resources. Nevertheless, in some areas of the school, such as classrooms located far from access points or zones with high user density, the signal quality tends to decrease. These limitations may affect teaching and learning efficiency. Therefore, studying the impact of signal density across school areas is a useful approach for improving the performance of network systems [6].

This study aimed to evaluate the quality of mobile phone signals (Wi-Fi and 5G) at Thammasat Secondary School and assess how signal density affects communication quality in different school areas, such as classrooms, cafeterias, and basketball courts. This study aims to understand the impact of varying signal strengths on the performance of Internet-

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dependent educational activities, such as online learning and real-time communication between students and teachers. By comparing the performance of Wi-Fi and 5G networks in terms of download speed, upload speed, and latency, this study seeks to provide insights into how to optimize network infrastructure in high-density areas to effectively support educational needs.

2. Literature Review

Studies on mobile phone signal quality and the effects of user density in crowded areas have gained attention from researchers in various fields, especially in wireless communication. These technologies are widely used to meet the growing demand for data in the digital age. This review focuses on studies that measure and evaluate the quality of wireless networks such as Wi-Fi and 5G. It also examines the impact of user congestion in environments such as schools and universities, aiming to understand how these technologies are applied in educational settings.

2.1 Development of Wireless Networks and Technologies

Wireless networks began to develop in the 1990s with Wi-Fi, which became the standard for homes and workplaces. Wi-Fi improves wireless communication efficiency and supports higher data traffic. It has also enabled widespread use in schools and public areas. Subsequently, 5G was introduced to provide higher download speeds and lower latency. This technology further improves data access, particularly in areas with many users [7, 8].

2.2 Effects of User Density on Signal Quality

Several studies have investigated the effect of high user density on network performance. Wi-Fi and 5G networks often experience congestion in areas with many users, especially during peak periods such as lunch breaks. Adiba Abd Ghafar et al. found that increased user numbers significantly reduced Wi-Fi speed and caused delays in data downloads [9].

2.3 Effects of Signal Quality on Teaching and Learning

Signal quality is important in schools. Unstable connections can disrupt access to online learning materials and other Internet-dependent activities. Corredor Vallejo reported that poor Wi-Fi connectivity in classrooms and common areas delays access to educational content and negatively affects learning outcomes [10].

2.4 Strategies to Improve Wireless Networks for Education

Studies have proposed strategies for improving wireless network performance in schools. One approach is to add access points in weak-signal or high-traffic areas. Access control technologies can help manage the number of users in a system. Upgrading the Wi-Fi and 5G infrastructure can increase capacity and support future demands [6, 11, 12].

3. Research Methodology

This study employed a descriptive research design. The primary goal was to collect quantitative data on the quality of mobile phone signals (Wi-Fi and 5G) in various areas of the Thammasat Secondary School. The data collection focused on comparing the network performance and effects of user density. A signal measurement tool was used to record the download and upload speeds, as well as latency.

3.1 Data Collection

Data were collected in multiple locations, including classrooms, school buildings, cafeterias, and basketball courts. Measurements were taken at three time points: morning (08:00), midday (12:00), and afternoon (16:00), to compare the network quality across different periods. The collected data included download speed, upload speed, latency, and Internet usage performance, such as web browsing and streaming. The nPerf

application was used as the measurement tool because it can accurately measure download and upload speeds as well as latency.

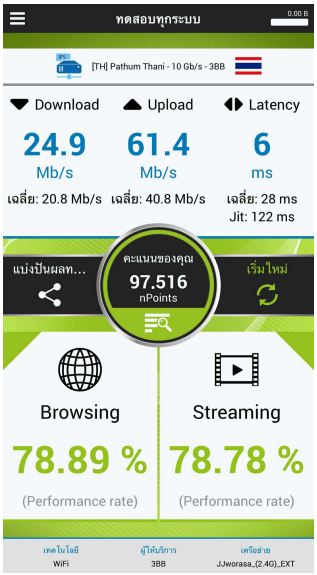

Figure 1. nPerf application.

3.2 Study Areas

This study focused on areas with high network usage. These included classrooms in buildings A B, and C; the cafeteria; the basketball court during breaks; and the main halls of buildings A and B. The locations were selected based on consistent daily network usage. Data were collected during class hours lunch breaks, and the afternoon period to examine the effects of user density at different times of day.

Figure 2. Thammasat secondary school**.**

3.3 Data Analysis

The collected data were analyzed using basic statistical techniques. The mean was calculated to show the general trends in the data. A correlation analysis was conducted to examine the relationship between the signal speed and latency.

4. Results

This study collected data on the signal quality in different areas of the Thammasat Secondary School. The analysis focused on comparing the performances of Wi-Fi and 5G networks. The key indicators included download speed, upload speed, latency, browsing performance, and streaming performance at different times of the day.

4.1 Comparison of Signal Performance in Different Areas

Measurements showed that Wi-Fi generally outperformed 5G in several areas, especially in terms of download speed and lower latency. This was particularly evident in the cafeteria, basketball court, and classrooms near the access points. The average results are presented in Table 1.

Table 1. Comparison of Wi-Fi and 5G network quality (average) in different areas.

Area	Wi-Fi	5G
Cafeteria	Download: 196.29 Mbps Upload: 129.51 Mbps Latency: 5.29 ms Browsing: 79.79% Streaming: 90%	Download: 114.71 Mbps Upload: 8.01 Mbps Latency: 25.43 ms Browsing: 65.59% Streaming: 79.51%
Basketball Court	Download: 161.46 Mbps Upload: 105.88 Mbps Latency: 4.8 ms Browsing: 83.15% Streaming: 93.49%	Download: 176.47 Mbps Upload: 21.03 Mbps Latency: 24.67 ms Browsing: 76.28% Streaming: 86.84%
Classrooms (Buildings A, B, C)	Download: 193 Mbps Upload: 120 Mbps Latency: 5 ms Browsing: 74.01% Streaming: 93.45%	Download: 110.13 Mbps Upload: 11.83 Mbps Latency: 24.3 ms Browsing: 70.54% Streaming: 87.23%

The comparison indicates that Wi-Fi is more stable and performs better in supporting many users. It is suitable for environments that require fast and reliable connections, such as cafeterias, basketball courts, and heavily used classrooms.

4.2 Effects of Usage Time on Connection Performance

The study examined the Wi-Fi and 5G network performance at three different times: 08:00, 12:00, and 16:00. The results showed that high user density during lunch hours (12:00) significantly affected connection quality. Differences in the performance of Wi-Fi and 5G were observed, as summarized in Table 2.

Table 2. Effects of usage time on network performance.

Time	Wi-Fi	5G
08:00	Download: 165.71 Mbps Upload: 114.5 Mbps Latency: 5.34 ms Browsing: 77.58% Streaming: 91.54%	Download: 158.55 Mbps Upload: 12.18 Mbps Latency: 23.35 ms Browsing: 72.06% Streaming: 85.39%
12:00	Download: 164.73 Mbps Upload: 125.66 Mbps Latency: 6 ms Browsing: 78.48% Streaming: 91.56%	Download: 112.91 Mbps Upload: 10.15 Mbps Latency: 24.31 ms Browsing: 72.82% Streaming: 84.44%

Time	Wi-Fi	5G
16:00	Download: 167.31 Mbps Upload: 111.41 Mbps Latency: 5.35 ms Browsing: 78.36% Streaming: 91.8%	Download: 110.16 Mbps Upload: 13.9 Mbps Latency: 25.12 ms Browsing: 70.83% Streaming: 84.34%

The analysis indicates that Wi-Fi maintained a stable performance across all time periods, even during high-usage times, such as 12:00. In contrast, 5G, while fast at certain times, shows higher latency during peak usage. This results in a lower overall performance during periods of heavy network traffic.

4.3 Correlation Analysis and Hypothesis Testing

This study conducted hypothesis testing and correlation analysis among several variables, including download speed, upload speed, latency, and browsing and streaming performance. The results show significant relationships between these variables (Table 3). The key findings are as follows.

Table 3. Correlation analysis between variables.

Variable	Wi-Fi (r)	5G (r)
Download Speed	Browsing Performance (0.82) Streaming Performance (0.80)	Browsing Performance (0.87) Streaming Performance (0.82)
Upload Speed	Browsing Performance (0.20) Streaming Performance (0.32)	Browsing Performance (0.19) Streaming Performance (0.34)
Latency	Download Speed (-0.75) Upload Speed (-0.71)	Download Speed (-0.64) Upload Speed (-0.58)
Browsing Performance	Download Speed (0.82)	Download Speed (0.87)
Streaming Performance	Download Speed (0.80)	Download Speed (0.82)

The key findings are as follows:

1. **Download Speed**

- Wi-Fi: Strongly correlated with browsing (r = 0.82) and streaming performance (r = 0.80).
- 5G: Strongly correlated with browsing (r = 0.87) and streaming performance (r = 0.82).

2. **Upload Speed**

- Wi-Fi: Weak correlation with browsing (r = 0.20) and streaming (r = 0.32).
- 5G: Moderate positive correlation with browsing (r = 0.19) and streaming (r = 0.34).

3. **Latency**

- Wi-Fi: Negatively correlated with download speed (r = -0.75) and upload speed (r = -0.71).
- 5G: Negatively correlated with download speed (r = -0.64) and upload speed (r = -0.58).

4. **Browsing Performance**

- Wi-Fi: Increases as download speed rises (r = 0.82)
- 5G: Increases as download speed rises (r = 0.87)

5. **Streaming Performance**

- Wi-Fi: Increases as download speed rises (r = 0.80)
- 5G: Increases as download speed rises (r = 0.82)

These results confirm that download speed is the main factor affecting browsing and streaming performance. Latency negatively impacts both download and upload speeds, affecting the overall performance of both networks.

5. Discussion

The study revealed significant differences in the performance of Wi-Fi and 5G networks at Thammasat Secondary School, particularly in high-density areas such as classrooms, cafeterias and basketball courts. These differences can be attributed to several physical and network-related factors that affect the signal quality and network performance in densely populated environments.

One of the primary factors influencing performance is the frequency characteristics of each technology. Wi-Fi generally operates in the 2.4 and 5 GHz frequency bands. While these frequencies are effective in providing adequate coverage, they are more susceptible to interference and signal degradation in high-density areas, especially during peak usage times. The 2.4 GHz band is particularly highly congested, as many devices (such as Bluetooth and microwave ovens) operate on similar frequencies, leading to increased interference and reduced bandwidth [1]. In contrast, 5G networks typically operate on higher frequency bands (e.g., 3.5 GHz and, in some cases, millimeter waves), which offer higher bandwidth and faster speeds [2]. However, 5G performance can be affected by physical obstructions (such as buildings and trees) and network congestion during peak times when a large number of users are connected to the same cell tower. This can cause fluctuations in speed and increased latency, particularly in areas where the signal coverage is less consistent [8].

User density is another critical factor contributing to the observed differences. A high user density increases the load on the network, which can lead to congestion and competition for bandwidth. Wi-Fi, especially in environments like classrooms and cafeterias, is typically better equipped to handle high user density due to its ability to support multiple simultaneous connections without significant degradation in performance [10]. Wi-Fi networks also benefit from the presence of multiple access points (APs) distributed throughout the environment, which helps alleviate congestion and ensure more stable connections. However, although 5G is capable of providing fast speeds, it faces challenges in high-density areas where its capacity to handle a large number of simultaneous connections is limited. The higher latency observed in 5G during peak usage times is a direct result of network congestion, which impedes the delivery of real-time applications such as video streaming or online learning activities that require low latency for smooth performance [5].

Furthermore, the network architecture and infrastructure of both Wi-Fi and 5G systems play a role in their performance. Wi-Fi networks are designed to provide local coverage in confined spaces, such as classrooms or cafeterias, using a mesh or star topology that allows for more efficient data distribution [6]. However, this can still lead to signal degradation in areas far from the access points (APs), particularly if the APs are not optimally placed. However, 5G networks

are designed for wide-area coverage, and although they offer high-speed connections, their coverage range can be limited by physical barriers, and their performance can drop significantly in areas with insufficient 5G infrastructure [7].

The findings highlight that while Wi-Fi offers more consistent performance in areas with high user density, 5G's performance can still be affected by a combination of network congestion, interference, and physical obstacles. These challenges emphasize the need for improved infrastructure, such as Wi-Fi 6 upgrades, better placement of access points, and potential integration of Wi-Fi/5G hybrid models to ensure that educational institutions can support a growing number of users and provide a stable, high-quality network environment for learning [12].

Such improvements could also support more reliable and efficient online learning activities and real-time communications within the school environment, especially during peak usage times [1]. Ensuring stable connectivity during these periods is crucial to maintaining the quality of learning experiences and minimizing interruptions in interactive educational activities [2].

6. Conclusion and Recommendations

This study compared the performance of Wi-Fi and 5G networks at Thammasat Secondary School, focusing on areas with high user density, such as classrooms, cafeterias, and basketball courts. The results showed that Wi-Fi consistently outperformed 5G, providing higher and more stable download and upload speeds, along with lower latency, making it better suited for high-density environments.

Although 5G has demonstrated high speeds in some areas, its performance is hindered by higher latency and network congestion, particularly in densely populated areas. These limitations can impact real-time applications, such as online learning, video conferencing, and interactive education, which require fast and stable connectivity. The findings emphasize the importance of network infrastructure that can handle high user density, ensuring that activities requiring low latency are performed smoothly without interruptions.

Based on these findings, it is recommended that educational institutions, especially those with high user densities, prioritize upgrading to Wi-Fi 6 to improve performance and reduce congestion. Wi-Fi 6 technology offers an enhanced capacity, enabling smoother communication and faster Internet access, even during peak usage times. Its advanced features, such as Orthogonal Frequency Division Multiple Access (OFDMA) and Multi-User Multiple Input, Multiple Output (MU-MIMO), will significantly improve efficiency and latency management during periods of high traffic, making it an ideal solution for crowded environments.

Additionally, adopting a hybrid Wi-Fi/5G model could enhance network capacity and ensure more reliable Internet access across different usage scenarios. This model would allow seamless switching between networks, providing stable connectivity during periods of heavy usage. Such upgrades could provide a more stable platform for online education and real-time communication, enhancing the learning experience across schools.

Furthermore, it is essential to increase the number of access points (APs) in high-density areas to improve the signal strength and coverage. Strategically placing APs in locations such as classrooms, cafeterias, and sports fields will help mitigate signal degradation and ensure more reliable Internet connections during peak usage times.

Network traffic management should also be implemented, prioritizing educational traffic, especially for online learning, video conferencing, and live streamed lessons. This

would help ensure that critical educational services are prioritized, thereby reducing latency and improving overall performance.

Finally, further research is recommended to explore the long-term impacts of Wi-Fi 6 and 5G hybrid systems on educational outcomes, specifically in terms of student engagement, and academic performance. Investigating the effectiveness of hybrid systems in diverse school environments will help determine the most suitable solution for optimizing network performance and accommodating future technological demands.

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Exploring ChatGPT's Role in English Language Learning: Insights from Pre-Service Teachers

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Abstract

The proliferation of AI tools like ChatGPT is reshaping the traditional teaching-learning model, expanding the boundaries of classroom learning into new and innovative spaces. This study utilized a descriptive quantitative design using a validated survey questionnaire to explore pre-service teachers' perceptions of ChatGPT's influence on their engagement in English language learning activities. Participants included 451 pre-service teachers majoring in English from two higher education institutions in region 7. The findings indicate a predominantly positive perception of ChatGPT among pre-service teachers. They reported heightened interest, motivation, and active participation in language learning activities facilitated by ChatGPT. Additionally, participants perceived that ChatGPT supports improvements in their language proficiency and skills development. Nevertheless, concerns regarding potential over-reliance on AI writing tools, as highlighted in the literature, were noted. While pre-service teachers acknowledged ChatGPT's benefits, uncertainties were expressed about its potential impact on critical thinking and creativity. The results suggest that ChatGPT holds promise as a valuable tool for promoting classroom engagement and enriching language learning experiences. However, further research is needed to explore the impact of AI tools in enhancing students' macro skills and to identify the best integration strategies for maximizing the benefits of ChatGPT in language education.

Keywords: Artificial intelligence, ChatGPT, English language learning, Language teaching, Pre-service teachers

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1. Introduction

Chatbots have transcended classroom learning. The current teaching-learning model has been again challenged by the continuous development of artificial intelligence (AI) leading to ground-breaking tools like ChatGPT (Chat Generative Pretrained Transformer). AI involves machines performing tasks that were traditionally done by humans. They use simulated human thinking to solve complex problems, learn from mistakes, improve themselves, engage in creative tasks, and provide instant answers. The emergence of these various digital tools transformed how the world operates today [1].

Although AI-based tools have been used in education settings for the past years in creating for example personalized learning materials for students [2], the development of highly sophisticated chatbots that can converse in human-like ways and comprehend human language [3] has created a stir among educators. Consequently, AI tools have been utilized for various purposes like enhancing students' learning experiences or automating administrative tasks [4]. Likewise, students noted time-management advantages, 24/7 access to learning from anywhere, individualized learning programs tailored to each student's abilities and goals, and tutoring via AI chatbots [5] among others.

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ChatGPT is a conversational chatbot developed by OpenAI [6] built using a state-of-the-art language model and programmed using a large dataset [7] enabling it to create a logical, organized, and relevant response. It is a form of generative AI that produces human-like responses to questions in natural language using deep learning. CNN Business News reported that ChatGPT has passed university-level exams particularly law exams in four different courses at the University of Minnesota Law School [8]. Although it is not at the level of an A+ student, it still attained a passing grade in all these exams. This AI tool was released last November 2022 and since then has quickly penetrated learning environments.

What makes ChatGPT unique from other chatbots and AI tools used in education is its distinctive mix of a huge data set, personalization, and scalability which makes it a useful tool for both students and teachers in several educational contexts. It can assist teachers in constructing lesson designs and syllabi, constructing tests, summarizing complex content, providing translations, and designing more engaging classroom activities. Moreover, this tool helps students clarify and answer queries; provides personalized tutorial sessions; offers lecture summaries and explanations based on the prompts it received; and helps in language learning and practice speaking, writing, and comprehension [9]. Students describe it as a “know-it-all-companion”. The use of this AI technology in education has the potential to significantly improve learning and pedagogical experiences in a variety of ways [10].

Furthermore, in the context of language teaching, educators need to figure out how to best utilize technology to help students become more proficient communicators. The most efficient language learning approach is a blend of well-designed multimedia programs and coordinated classroom activities [11], and incorporation of multiple AI tools [12]. Language teaching applies to the teaching of different skills like listening, speaking, reading, and writing, thus it demands a great deal of innovation and creativity [13]. On the other hand, [14] raises doubts about whether AI can exhibit creativity by examining its applications in visual arts, music, text, and musical theater. He outlines key factors in the creative process, such as introspection and problem discovery, and concludes that computers cannot match human creativity. On the contrary, [15] proposes that computational creativity does not have to mirror human creativity; instead, it can offer new processes and outcomes, contributing to a distinct form of creativity. According to Ward, the focus should be on recognizing the unique creative capabilities of machines, opening up intriguing possibilities for the evolution of teaching and learning in the AI era. Likewise, the notion of an "education meta-universe" has garnered global attention. This concept entails establishing a virtual environment wherein students can engage in learning and interact not only with each other but also with AI-driven virtual instructors. Through this approach, AI technologies hold the promise of revolutionizing conventional foreign language teaching approaches and introducing new opportunities for language acquisition. Recent literature on AI in education can be broadly organized into three thematic strands: (1) studies emphasizing AI-supported learner engagement and motivation, (2) research examining perceived language learning outcomes and academic support, and (3) critical discussions highlighting pedagogical, ethical, and cognitive concerns associated with AI use. While these strands provide valuable insights, they often focus on general student populations or classroom outcomes, leaving limited attention to the perspectives of pre-service language teachers.

Similarly, in light of the increased prevalence of digital writing environments in educational contexts and their continued expansion, language teaching should not shun AI technologies. Typically, AI writing tools are

designed to analyze written content and offer feedback on various aspects of writing, including grammar, vocabulary, syntax, content, and structure [16, 17]. This feedback is generated using machine-learning algorithms that compare the text with a large database of correct and incorrect writing examples. Essentially, these tools provide students with immediate and personalized feedback, aiding them in identifying and rectifying errors more efficiently. Additionally, real-time feedback can help students grasp fundamental writing concepts and guide them in improving their writing skills [18, 19, 20] assert that arranging ideas effectively is essential in L2 writing, with students frequently facing challenges in achieving coherence and logical flow in their texts. In this context, AI writing tools offer immediate feedback and recommendations for restructuring sentences and paragraphs, thereby assisting students in enhancing the organization of their writing [21].

Writing, artificial intelligence, and creativity are becoming core objectives for modern language education approaches. But language instructors are likewise worried about ChatGPT's use in language instruction. Concerns over cheating in particular, as well as the students' reliance on this chatbot for everything, could potentially impair students' cognitive abilities, such as their capacity to write and research. Essays are a key component of teaching reading, writing, and comprehension abilities; therefore, it is possible that children are not learning these important skills if they are utilizing a shortcut like ChatGPT. Students turn to ChatGPT for assignments and schoolwork much sooner than educators begin to understand them. Although ChatGPT and other AI tools have generated much discussion online about their potential to replace teachers and encourage cheating, other educators view these tools as opportunities. Further, [22] highlighted the absence of definitive, practical guidelines for education researchers and practitioners seeking quick references on AI in education. The potential impact and effects of AI are boundless. It can significantly influence both the present and future of learners [23]. While numerous studies have examined ChatGPT's capabilities and limitations across various educational contexts, there remains limited empirical evidence on how pre-service teachers perceive its role specifically in English language learning. As future language educators, their perceptions matter because they directly influence classroom practices, openness to AI-assisted learning, and pedagogical adoption. Despite the growing research on ChatGPT in education, little is known about how pre-service teachers—future language educators—perceive its role in English language learning. Notably, there remains a lack of large-scale empirical studies that focus specifically on pre-service English teachers' perceptions of ChatGPT within localized higher education contexts, particularly in the Philippine setting. Understanding these perceptions is critical, as they can inform teacher education curricula, guide the development of responsible AI integration policies, and shape future classroom practices adopted by emerging language educators. Given these considerations, understanding pre-service teachers' perceptions is essential for informing responsible and effective AI integration in English language teaching.

1.1 Study Objectives

This study aims to explore ChatGPT's potential role in English language acquisition from the perspectives of pre-service teachers. Specifically, it seeks to answer the following questions,

1. What are pre-service teachers' initial impressions of using ChatGPT for English language instruction?
2. What are the pre-service teachers' perceptions of ChatGPT's support for their language proficiency and skills development?
3. What are their perceptions on ChatGPT's influence on their engagement in English language learning activities?

2. Methodology

2.1 Research Design

This study employed a descriptive quantitative design, utilizing a 4-point Likert scale to assess pre-service teachers' overall experience, learning outcomes, and perception of ChatGPT's impact on their engagement in English language learning activities. This allowed the researcher to collect accurate data and identify patterns that significantly led to a thorough understanding of the study.

2.2. Research Instrument

The study utilized a structured survey questionnaire comprising three sections, each containing 7 statements. The survey questionnaire underwent expert validation to establish content validity, and reliability was ensured through pilot testing, yielding an acceptable internal consistency coefficient. Participants were prompted to express their responses using a four-point Likert scale, ranging from Strongly Agree to Strongly Disagree. This method enabled a targeted and streamlined exploration of the study's goals. Moreover, the researcher incorporated an interview guide, validated by experts, to capture participants' narratives and corroborate their survey responses.

2.3 Research Participants

The participants of the study were the pre-service teachers in two higher education institutions in Region 7, Cebu and Bohol, Philippines They are those officially enrolled in these two universities S.Y. 2023-2024 and from the 2nd to 4th levels with a field of specialization in English. Four hundred fifty-one (451) pre-service teachers majoring in English answered the survey stratified sampling ensured representation from year levels and the two different institutions. Meanwhile, 20 participated in the focus group discussion. The FGD was conducted to validate the quantitative responses of the participants.

2.4 Data Analysis

In the initial stage of data analysis, the survey responses were subjected to descriptive statistics, including computation of the mean and simple percentages. Descriptive statistics provide insights into different dimensions of the population under study. Qualitative data from the focus group discussions were analyzed using thematic analysis, involving data familiarization, initial coding, and theme generation. These qualitative data served as a validation mechanism for the survey responses rather than as a separate explanatory analysis.

3. Results and Discussion

The results presented in this section reflect participants' self-reported perceptions of ChatGPT's influence on English language learning rather than objectively measured learning outcomes. While mean scores are used to describe overall trends, variability in responses suggests differences in individual experiences and levels of familiarity with AI-assisted learning tools.

3.1. Pre-service Teachers' Perceived Overall Experience with ChatGPT

The results in Table 1 show that pre-service teachers generally hold positive initial impressions of ChatGPT, particularly in terms of its ease of use, suitability for teaching, and potential to support English language instruction. High mean scores on statements highlighting ChatGPT's usefulness and promise indicate openness to adopting AI-assisted tools in future teaching practice.

Although most of the responses are positive, one statement got a mean score of 2.36 indicating disagreement. This statement says, "ChatGPT seems like a familiar tool for teaching English". Their response to this statement could be attributed to several factors. One possibility is that pre-service teachers may have limited prior exposure to or experience with natural language processing technology like ChatGPT specifically tailored for language instruction. Although there are research articles exploring the use of AI tools in the teaching of writing [24, 25, 26], the limited capacity of tools like ChatGPT to discern the distinctions and emotional undertones of language [27] may contribute to the hesitancy in adopting it as a familiar tool for teaching English. The higher-order writing elements such as forming coherent arguments and structuring them logically require an in-depth understanding and critical analysis, which AI, at this point, might not effectively support [28]. Moreover, unlike more traditional teaching tools or methods that they may have encountered during their school

experiences, ChatGPT represents a newer and potentially less familiar approach to language instruction. Consequently, most students identified the primary reasons for using AI tools for research (44%), summarizing or synthesizing information (38%), and creating study guides or materials (33%) [29]. Among student respondents who reported studying for at least three hours per weeknight, 72% mentioned utilizing ChatGPT or similar AI technologies. Additionally, the interface or functionality of ChatGPT might differ from other tools or platforms that students and their teachers typically use, contributing to a perception of novelty rather than familiarity. Thus, using artificial intelligence for language instruction could be relatively novel or unfamiliar to some pre-service teachers, leading them to perceive ChatGPT as less familiar initially.

Table 1. Overall experience with ChatGPT.

Statements	Mean	Description
I find ChatGPT not intimidating and challenging for English language instruction.	3.12	Agree
ChatGPT seems like a familiar tool for teaching English.	2.36	Disagree
ChatGPT shows potential for supporting language instruction effectively.	3.45	Strongly Agree
I find ChatGPT user-friendly and suitable for language teaching purposes.	3.16	Agree
I do not doubt the effectiveness of ChatGPT in facilitating language instruction.	3.17	Agree
ChatGPT offers promising possibilities for enhancing English teaching.	3.81	Strongly Agree
I am enthusiastic about incorporating ChatGPT into my language instruction.	3.35	Strongly Agree
Overall	3.20	Agree

Legend: 3.26 – 4.00: Strongly Agree; 2.51 – 3.25: Agree; 1.76 – 2.50: Disagree; 1.00 – 1.75: Strongly Disagree

Despite this lower rating, these soon-to-be teachers have acknowledged ChatGPT's potential for supporting language instruction effectively and deemed it user-friendly and suitable for educational purposes. Importantly, respondents did not doubt ChatGPT's effectiveness in facilitating language learning and expressed enthusiasm for its incorporation into their teaching practices. These findings indicate a readiness among pre-service teachers to embrace ChatGPT as a valuable resource for enhancing English teaching. However, while these initial impressions are promising, further research is warranted to explore the actual implementation of ChatGPT in classroom settings and its long-term impact on language learning outcomes.

3.2. Perceived Support of ChatGPT for Language Proficiency and Skills Development

Table 2 shows the pre-service teachers' perceived effectiveness of ChatGPT in

enhancing their language proficiency and skills development.

Table 2. Learning outcomes.

Statements	Mean	Description
ChatGPT has noticeably improved my language proficiency or skills.	3.10	Agree
I have observed some improvement in my language abilities due to ChatGPT.	2.94	Agree
ChatGPT has helped enhance my language proficiency.	3.20	Agree
I feel my language skills have significantly developed with the use of ChatGPT.	2.88	Agree
ChatGPT does contribute significantly to my language learning.	3.60	Strongly Agree
I have experienced positive changes in my language abilities because of ChatGPT.	3.29	Strongly Agree
ChatGPT has greatly enhanced my language proficiency and skills.	3.21	Agree
Overall	3.17	Agree

Legend: 3.26 – 4.00: Strongly Agree; 2.51 – 3.25: Agree; 1.76 – 2.50: Disagree; 1.00 – 1.75: Strongly Disagree

Overall, the data indicate that students have a generally positive perception of ChatGPT's impact on language learning. It is also noted that the following statements had a moderate level of agreement as reflected by the mean scores "ChatGPT has noticeably improved my language proficiency or skills" (3.10) and "I have observed some improvement in my language abilities due to ChatGPT" (2.94). Other statements including "ChatGPT does contribute significantly to my language learning" (3.60) and "I have experienced positive changes in my language abilities because of ChatGPT" (3.29) got a higher agreement which means that they reflect a stronger perception of effectiveness. Likewise, the statement "ChatGPT has helped enhance my language proficiency" has a mean score of 3.20 further supporting the notion that pre-service teachers view ChatGPT as beneficial for language development. The results also revealed that a few students perceived that their language skills had significantly improved with the use of ChatGPT (2.88), while the majority agreed that ChatGPT has enhanced their language proficiency and skills (3.21). The overall mean score of 3.17 for the "Overall" statement suggests a consensus among pre-service teachers regarding the positive impact of ChatGPT on their language learning journey.

Studies in education have shown that the use of AI writing tools like ChatGPT may positively influence language learning. For instance [30] mentioned that students who received AI-assisted instruction have shown improvements in writing and have increased their level of motivation. Teachers also have expressed that AI writing tools can help improve the clarity ad logical flow of students' writing [31]. Likewise, students using ERNIE Bot, an AI bot like ChatGPT, as a supplementary tool show increased engagement and enthusiasm in writing their proposal writing process, leading to noticeable enhancements in the structural clarity and language precision of their written texts [32]. AI tools play a significant role in helping students develop their ideas and assisting them in overcoming obstacles to creativity [33].

Even with these positive notions, there were still apprehensions regarding the effect of AI tools on students. Students may develop an excessive dependency on these tools, letting AI think for them, thus hindering the development of their critical thinking and problem-solving skills [34]. AI technologies may diminish creative and critical thinking abilities among students thus hampering one's capability to independently evaluate writing quality.

Nevertheless, the responses of pre-service teachers demonstrate a generally favourable perception of ChatGPT's effectiveness in enhancing language proficiency and skills development. The majority of them believed that ChatGPT has contributed significantly to their language learning journey, with many reporting positive changes and improvements in their language abilities as a result of using the tool. Thus, it would be noteworthy to delve deeper into specific areas where ChatGPT has been most beneficial for language development. Also,

exploring the potential implementation of ChatGPT in various educational settings could provide further insights into its efficacy. Further research is suggested to not only validate this study's preliminary findings but also to identify best practices for effectively integrating ChatGPT and other AI tools into language learning curricula and instructional strategies. These results align with previous studies suggesting that AI tools are associated with perceived improvements in clarity, organization, and learner confidence in writing [30, 31]. However, the moderate mean scores also indicate that improvements may not be uniform, suggesting the need for more guided integration of AI tools to maximize learning outcomes.

3.3. ChatGPT and its Perceived Effect on the Pre-service Teachers' Interaction and Communication

The survey results as presented in Table 3 shed light on the pre-service teachers' perceptions of ChatGPT's possible impact on their engagement in English language learning activities. Overall, the responses convey a positive outlook on ChatGPT's influence, with strong agreement across various statements indicating increased interest, motivation, and active participation in language learning tasks facilitated by ChatGPT.

Table 3. Interaction and communication.

Statements	Mean	Description
ChatGPT makes me more interested in English language learning activities.	3.13	Agree
I feel interested towards English language learning activities when using ChatGPT.	2.87	Agree
ChatGPT encourages me to engage more actively in English language learning activities.	3.79	Strongly Agree
I find myself more motivated to participate in language learning with ChatGPT.	3.61	Strongly Agree
ChatGPT has significantly impacted my engagement in language learning activities.	3.51	Strongly Agree
I feel more involved in language learning tasks because of ChatGPT.	3.74	Strongly Agree
ChatGPT encourages me to actively communicate and interact during language learning activities.	3.75	Strongly Agree
Overall	3.48	Strongly Agree

Legend: 3.26 – 4.00: Strongly Agree; 2.51 – 3.25: Agree; 1.76 – 2.50: Disagree; 1.00 – 1.75: Strongly Disagree

The findings above imply that the pre-service teachers regard ChatGPT as a valuable tool for enhancing their language engagement and providing a more immersive experience for them. It also indicated the they have recognized ChatGPT not only as a source of information but also a catalyst of dialogue, exporation, and interactive learning. These quantitative findings were corroborated in the focus group discussions, where participants described ChatGPT as a convenient support tool that enhanced confidence and engagement,

while also expressing caution about over-dependence on AI for language tasks.

However, contrasting viewpoints have been presented in the literature. A study revealed that teachers have a growing inclination to incorporate a blend of AI tools to enrich the learning experience of their students which leads to improved academic performance, including writing skills [35]. Yet, [36] provided a critical stance, cautioning against the potential consequences of excessive reliance on AI writing tools. He argued that overreliance on these tools can diminish students critical thinking skills and hinder their ability to learn from their mistakes which can lead to impeding growth and development in writing. Students creativity and originality may also be restricted thus limiting their opportunities for individual expression and the development of unique writing styles and voices. Nevertheless, this study revealed that in the case of pre-service teachers, positive perception may carry significant implications for the integration of ChatGPT and other AI tools into the language learning curricula.

By enhancing engagement, ChatGPT can potentially contribute to perceived improvements in language learning experiences. Additionally, the enthusiasm expressed by respondents underscores the potential for ChatGPT to address common challenges in language instruction, such as maintaining student interest and motivation. However, educators must recognize the importance of balancing the use of ChatGPT with other pedagogical approaches to ensure a comprehensive and well-rounded learning experience. Moreover, further research could explore into specific strategies for maximizing the engagement-enhancing potential of ChatGPT and its long-term impact on language proficiency and skills development.

4. Conclusion and Recommendations

This study concludes that pre-service teachers generally hold positive attitudes toward ChatGPT's role in English language learning. They view it as a tool that enhances engagement, motivation, and interaction, and they perceived ChatGPT as a tool that supports improvements in their language proficiency and skills development. These insights are valuable because pre-service teachers will shape future classroom practices, and their openness to AI suggests strong potential for integrating AI-supported approaches in English instruction. The findings further suggest that perceptions of engagement, perceived learning support, and attitudes toward AI use are interconnected in teacher education contexts, with higher engagement often accompanying more favorable views of ChatGPT's instructional value.

However, concerns about over-reliance and reduced critical thinking remain, echoing wider debates in the literature. The study contributes to existing research by providing empirical evidence from pre-service teachers—an understudied but influential group. Future research should examine classroom-based implementation, long-term learning effects, and the impact of ChatGPT on specific macro skills such as writing, speaking, and reading comprehension. Developing clear guidelines on responsible and pedagogically sound integration of AI tools in language education is also recommended.

In educational settings, these findings imply that teacher education programs should intentionally integrate AI literacy and guided use of tools such as ChatGPT into English pedagogy courses to maximize learning benefits while minimizing risks. Embedding critical evaluation, ethical use, and reflective practice in AI-supported activities can help future teachers leverage technology without compromising students' higher-order thinking skills.

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Sailing to success: A probabilistic analysis of factors influencing to pass the Licensure Examination for Fisheries Technologists

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Abstract

The governing board like Professional Regulatory Commission conducts licensure examinations which serve as indicators of producing quality graduates. The results of licensure examination in all programs with board examination has been considered as evidence of the quality of instruction higher education institutions provide in their clienteles. However, from 2015 the national passing rate of the Licensure Examination for Fisheries Technologist is poor. This research was conducted to assess if admission test scores and high school grades were significant predictors of the Licensure Examination for Fisheries Technologists (LEFT). Employing a quantitative non-experimental design with the use of secondary data, the results of the study were investigated using frequency, spearman rho, and binary logistic regression. The study revealed that 33.87% of the LEFT takers had average admission test scores and 38.71% of the takers had good academic performance, and 35.50% of the takers successfully passed the LEFT. Further, the result of the study confirmed that there was a weak positive correlation between admission test scores and LEFT results ($r=0.357$, $p= 0.004$), and academic performance and LEFT results ($r=0.292$, $p=0.021$). It was concluded that admission test scores were the only variable with a significant likelihood of influencing LEFT outcomes. Statistically, it implied that, for every one-point increase in the admission test score, the likelihood of a corresponding increase in the LEFT average score by approximately 2. The study suggests that HEIs offering BSFT programs may consider admitting new students with at least average admission test scores. This study's findings can be a basis for future research utilizing other research designs. Additionally, researchers could investigate the mediating effect of review programs on licensure examination performance.

Keywords: *Admission Test Score; Binary Logistic Regression; High School Grade; Licensure Examination for Fisheries Technologists*

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1. Introduction

Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all were one of sustainable development goals. One indicator is there will be a proportion of the population in each age group who at least fixed the level of proficiency. The question is, are higher education institutions (HEIs) producing quality graduates? How do we measure quality graduates? The governing boards like Professional Regulatory Commission (PRC) conducts licensure examinations which serve as indicators of producing quality graduates [1]. The results of licensure examinations in all programs with board examinations have been considered as a positive measure of student outcomes and it is also considered as evidence of the quality of instruction HEIs provide in their clienteles [2].

To fulfill in producing quality graduates, HEIs need to prepare students for the licensure examination since this tells the quality of education and training the institutions provide. With the increasing number of HEIs in the Philippines, it entails that the access to

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college education and its quality has been an interested topic for many scholars specifically in terms of quality education [3]. The effectiveness and the efficiency of the schools depend on the licensure examination results [4]. Despite the effort of the institutions, the decrease of the passing rate in the licensure examinations is an indicator that the quality of education is deteriorating [5].

Taking licensure examinations including LEFT is one of the important factors in the curriculum and instructional implementation. The performance of the students during the licensure examinations is one of the indicators of efficiency of the schools and the intellectual capacity of graduates. Moreover, licensure examination results are also considered as one of the indicators to evaluate by the accreditation bodies particularly in the institutions quality assurance [1]. Moreover, many of the professions conduct licensure examinations to assess and evaluate qualified graduates in their respective fields [6].

In education, graduates in teacher education will take Licensure Examination for Teachers (LET). Many HEIs in the Philippines have already established their names in terms of producing quality teacher education graduates as seen in their LET performance. There are several studies that posited different factors that influence LET performance. These factors include the profile of the school, teachers' competence, school facilities, curriculum and instruction, and admission and retention policies. Furthermore, the academic achievement of the teacher education graduates is also attributed to the performance of LET takers. This implies that there is an effective implementation of instruction and sound evaluation procedures in the HIEs since the performance of the takers during their college education coincides with their LET performance [7].

Other professions such as nursing education considered licensure examination as the indicator of quality of the nursing program HEIs offered. There were also attempts to investigate factors that predict the chance of passing the nursing licensure examination (NLE). These factors include pre-entry qualifications including High School Grade, college admission test, nursing aptitude test, and academic performance. Further, identifying what factors that contribute to the success of graduates taking NLE may be useful in developing admission and retention policy in nursing courses. Tertiary schools offering nursing programs conduct standardized competency assessments on their students before graduation. This program ensures that their graduates are ready and assess their likelihood of passing the NLE [8].

There is also research conducted on the predictors for passing the licensure examination for agriculturists (LEA). The study confirmed that LEA passers who were fresh graduates showed a higher percentage of passing rate the exam. Furthermore, it is revealed that to successfully pass the LEA, graduates need to have good academic performance, better performance in the college admission test, and very good course audit performance. These indicators were considered predictors of licensure examination, particularly in LEA. The study posited low performance in these factors may result in low performance in licensure examination for agriculturist [9].

In line with the Philippine Fisheries Professional Act, the Professional Regulatory Board of Fisheries Resolution No. 06 series of 2022 discussed that the State should give priority attention and support to the professional development of fisheries professions in the Philippines. The aim of these actions is to maintain the country's food security and economic development, with a view to raising standards in fisheries education. At least once a year, the graduates of BS fisheries and their associated field shall undertake and pass written examinations organized by the Professional Regulatory Body in Fisheries. The coverage of the examination is Aquatic Resource and Ecology, Aquaculture,

Capture Fisheries, and the Post-harvest Fisheries.

In the Licensure Examination for Fisheries Technologist (LEFT) from 2015-2019, it is found out that the passing rate did not reach 50%. In October 2015 examination there were 366 (36.09%) who successfully passed the exam out of 1,014. Last October 2016 only 457 examinees passed out of 1,391 (32.85%). In 2017, only 479 out of 1,399 (34.24%) successfully passed the LEFT. During the 2018 LEFT only 502 out of 1,773 (28.31%) passed the exam. And last 2019 LEFT, 34.79% or 731 out of 2,101 had successfully passed the exam. During the pandemic, the 2020 examination was cancelled. In October 2021, 211 out 715 or 29.51% of the takers passed the licensure examination. In 2022, 36.42% or 716 out of 1,966 takers successfully passed the examination (Professional Regulatory Commission). Davao del Norte State College is one of the state universities and colleges in the Philippines offering Bachelor of Science in Fisheries who also participated in the LEFT. The College performance during the 2015 LEFT was 25%. In 2016 the College got a performance of 30.77%. In 2018, the result of college performance in the LEFT was 35%. During the 2018 LEFT the College got 18.03%. and in 2019 LEFT the College received a score of 35.48%. The above figure indicates that the College needs to improve its performance in order to become a Centre for Fisheries Technology Development. In addition, the performance of the graduates in the licensure examination is an indication of their capacities specifically on innovative sustainable practices, advocate for effective policies, and engage in responsible resource management which are vital aspects of fishery industry [26].

There are various studies conducted to find out what are the factors that will affect the likelihood of passing the LEFT. The results show that work experience, in depth assessment, the amount of time taken to reread and review familiarity with the examination played a decisive role in determining LEFT performance [1]. Another study posited to be ready in the licensure examination, practicing is the single most important step in the process [10]. A study on licensure examination for fisheries technologist failed to include high school academic grades and entrance exam results as predictors of the LEFT results [1]. Though there are studies investigating the high school grade and entrance exam results, these are used in investigating licensure examination results in teacher education [11], agriculturists [12], and nursing [13]. To add on the body of knowledge in what factors the best predict in the Licensure Examination for Fisheries Technologists, this investigation is deemed necessary to determine if the college entrance test score and high school GPA are predictors of successfully passed the LEFT. Further, the result of the study will serve as the basis for revision of the admission policy of HEIs offering courses with board examinations.

1.1 Research Objectives

The study sought to establish which factors had a significant influence on the probability of successful passing the fishing technologist certification exam. Specifically, it aimed to determine the admission test score and academic performance of LEFT takers, assess the number of passers in the LEFT, determine the significant relationship between the admission test score and LEFT result and academic performance and LEFT result and determine if the admission test score and academic performance significantly influence the chance to pass the LEFT.

1.2 Hypothesis

The following hypotheses were tested at 0.05 level of significance that there is no significant relationship between the admission test score and LEFT result, academic performance and LEFT results; and admission test scores and academic performance did not significantly influence the LEFT results.

1.3 Theoretical Framework

The study is anchored on the Attribution Theory of Achievement [14]. This theory posited that achievement of the individual can be affected by different factors such as ability, effort, task difficulty, and luck. Moreover, this theory includes the locus of control, stability, and controllability as the dimension of attribution of achievement. The attribution theory explains that success and failure can be affected by either internal or external attributes. In the context of the study, the success and failure in the licensure examination for fisheries technologists can be affected by internal factors such as their abilities, effort, or preparation. This factor further discussed that when one got the higher score or achieved victory this will result in greater positive effect. This positive effect might also relate to their intelligence in which in this study, admission test score and high school grades are indicators of student intelligence.

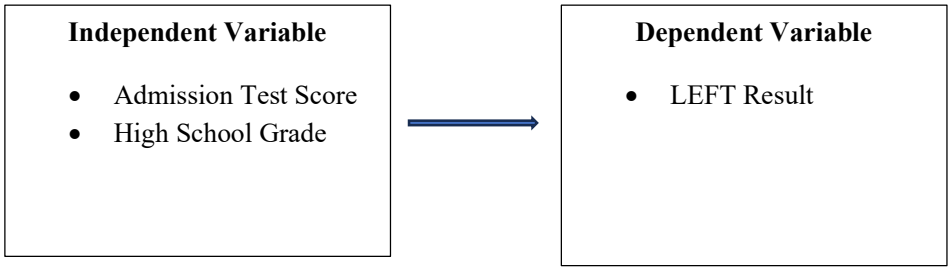

Figure 1. Conceptual framework of the study.

2. Methods

Quantitative non-experimental research design was employed to attain the objectives of study since this design is used when researcher gathers, analyzes, interprets, and writes the results of the study. Quantitative research is a systematic process comprising observing and describing phenomena which are used to identify relationships between independent variables and dependent variables [15]. The research utilized secondary quantitative research methods since the study used data, which includes Otis-Lennon School Ability Test (OLSAT) results, high school grade, and the LEFT performance of the graduates from 2015-2019. Moreover, this research employed a correlational research approach in which variables were tested to see if they were significantly related to each other. Correlation tells us that, whether it is positive or negative correlation, the change in the magnitude of 1 variable will be followed by a change in the magnitude of another variable [16]. The independent variables were OLSAT result, and high school grade and the dependent variable was the LEFT result.

To obtain the data to be used in this study, the researcher sought approval from the participants to use their admission test score, their high school grade, and their LEFT results. Through a direct message, the researcher sent a consent letter to the Bachelor of Science in Fisheries from 2015-2019. From 2015-2019, there were 62 graduates who took the LEFT. After their approval, the researcher wrote a letter to the Professional Regulatory Commission to retrieve the LEFT results from 2015-2019. The researcher also sent a letter to the College registrar to get the high school grade of the LEFT takers and at the same time a letter was sent to the Guidance and testing Office to retrieve the admission test score of the LEFT takers. The data were treated using the following statistical tool, frequency was used to determine the OLSAT result, high school grades, and LEFT results. Spearman's rho Correlation was used to determine if OLSAT and high school grade were significantly related to LEFT results. Binary logistic regression was used to determine if OLSAT and high school grades significantly predict the LEFT results.

In terms of the ethical consideration of the study, research adheres to the guidelines of

RA 10173 or also known as the Data Privacy Act of 2012. It is explained in this law that all the data retrieved in this study shall be treated confidentially, protected, and shall be used for the purpose only. The researcher has taken account of the confidentiality and integrity of the data collected. The data used by the researchers were from the college registrar, guidance and testing office, and the PRC and should be treated with utmost confidentiality and protection. The proper authority approved all the requests and made sure that the researcher secured consent from the LEFT takers. The researcher is responsible for ensuring that the gathered data is in a secure environment, which includes privacy and confidentiality of participant information. Researchers have a responsibility to protect participants' rights and welfare. To protect their integrity and confidentiality, the study participants signed an agreement not to disclose any information. The researchers have also noted that the study's objective was communicated to its participants. The signed consent was proof that research participants are voluntarily involved in the study, which allows researchers to obtain information specifically about LEFT results, admission test scores and grades.

3. Results and Discussion

One of the most important needs that any individual has for staying up to date with developments is obtaining a degree. It's one way for an individual to advance and develop his or her craft with the aim of becoming a human being [17]. After taking a degree, those graduates in programs with licensure examinations will take the board examination set by the Professional Regulatory Commission. Taking the board examination is one of the proofs of the quality of graduates Higher Education Institutions produced. Licensing examinations provide an opportunity to develop graduates into certified professionals with personal integrity and moral convictions, which allows them to compete globally. Graduates of the Bachelor Science of Fisheries and Technology or allied fields will take the Licensure Examination for Fisheries Technologists (LEFT) once a year. To determine which factors, predict the success of graduates to pass the LEFT, the study was conducted. Two factors were investigated admission test scores and high school grades.

For the students to enter Higher Education Institutions, they need to pass the admission requirements and one of these is taking admission test or entrance examinations [18]. Also, programs in higher degrees will also consider the high school grades of the student entrants [11]. Table 1 presents the results on the admission test score, high school grade, and LEFT result. The result of the study revealed that 21 or 33.87% of the LEFT takers got a Stanine 5 or Average, 14 or 22.58% of LEFT takers got Stanine 3 or below average, 13 or 20.97% of the LEFT takers got Stanine 4 or average, 5 or 8.06% of the LEFT Takers got Stanine 6 and Stanine 2 average and below average respectively. It is also shown in the result that 3 or 4.84% of the total number of LEFT Takers got Stanine 1 or below average and 1 or 1.61% of the LEFT takers got Stanine 7 or above average. It is important to note that looking at the entrance test score of the student entrants is the easiest way to determine the ability of the students and the chance of them to successfully finish their program [19]. In terms of high school grades, it is presented in this study that 24 or 38.71% LEFT Takers got a High School GPA of 89-91 Good, 14 or 22.58% of the LEFT Taker got a GPA of 80-82 Moderately Fair, 12 or 19.25% of the LEFT Takers had 86-88 Very Satisfactory GPA, 9 or 14.52% of the total number of LEFT Takers got 83-83 Satisfactory, and 3 or 4.84% of the LEFT Takers got a GPA of 77-79 Fair. As to the number of takers who passed and failed in the LEFT, the result revealed that LEFT Takers from 2015- 2019, 40 or 64.1% failed the exam and 22 or 35.5% successfully passed the licensure examination for fisheries technologists. The number of passers in the Licensure Examination for Fisheries Technologists sounds alarming especially since it is relatively low and does not even get 50%. The result implies that when the passing rate in the licensure examinations is decreasing it indicates that the quality of education is declining [5].

Table 1. Results on the admission test score, high school grade, and LEFT results.

Characteristics	Level	Frequency	%
Admission Test Score	Stanine 1	3	4.84
	Stanine 2	5	8.06
	Stanine 3	14	22.58
	Stanine 4	13	20.97
	Stanine 5	21	33.87
	Stanine 6	5	8.06
	Stanine 7	1	1.61
High School Grade	77-79	3	4.84
	80-82	14	22.58
	83-85	9	14.52
	86-88	12	19.35
	89-91	24	38.71
LEFT Result	Passed	22	35.50
	Failed	40	64.50

The important relationship between the score obtained on the admission test and the LEFT result, as well as academic performance and LEFT results is shown in Table 2. To determine the relationship between the variables in this study, a Spearman correlation was performed. This statistical tool is used since the data used are ordinal level (Admission Test Score and Academic Performance) and rank data (LEFT Result) [20]. The result confirmed that the admission test score of LEFT takers and LEFT results had a weak, positive monotonic correlation ($r= 0.357$, $n= 62$, $p <.004$). Statistically, it implies that the increase of the admission test score, LEFT score will also increase. The result of the study confirms that students who achieved a passing score in the admission test scores performed better in the licensure examinations [6, 11]. The result implies that since the college is using a standardized test for the admission exam, the BS Fisheries program should look on the result of all the college entrants and consider it as the admission requirement. It is important to remember that college examination is a standardized test used by the institutions for them to know the probability of students entering the program will finish their degree program [18].

Table 2. Significant relationship between the admission test score and LEFT result, academic performance and LEFT results.

Independent Variables	LEFT
Admission Test Score	0.357* 0.004
High School Grade	0.292* 0.021

In addition, to determine the relationship between the academic performance of LEFT takers, a Spearman correlation was also used. Moreover, result revealed that there is a weak, positive monotonic correlation between the academic performance of LEFT Takers and LEFT Results ($r=0.292$, $n=62$, $p<.021$). Statistically, this implies that the higher the grades of the students who will enter the BS Fisheries Program, the LEFT Result will increase. However, it is confirmed that high school grades are not significantly correlated with the licensure examination which is different from the result of this study. It is further explained that basic education is intended to develop basic skills while higher education is intended to give specialized skills in their chosen field [21].

Table 3. Logistic regression predicting the likelihood of passing the licensure examination for fisheries technologists.

							95% C.I. for Exp(B)	
		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**	**Lower**	**Upper**
Step1[a]	Admission Test Score	.590	.266	4.931	1	.026	1.804	1.072	3.038
	High School Grade	.139	.098	2.022	1	.155	1.149	.949	1.391
	Constant	-15.049	8.290	3.296	1	.069	.000		

A logistic regression analysis is shown in Table 3 that estimates the likelihood of a successful Licensure Examination for Fisheries Technologists. To assess the impact of certain factors on whether or not a fisheries technologist passes an examination for license, binary logistic regression is performed. The model contained two independent variables (Admission Test Score and Academic Performance). The full model containing all predictors was statistically significant, $\chi 2$ (2, n=62) = 11.465 $p < .003$, indicating that the model was able to distinguish between which of the variables predicts the chance of passing the LEFT exam. The model, explained between 16.9% (Cox & Snell R Square) and 23.2% (Nagelkerke R Squared) of the two variables will influence the LEFT Result. Based on the Classification Table, it is revealed that the correctness of prediction is 69.4%. Based on the Model Data Fit, the insignificant result in the Hosmer and Lemeshow Test is $p > .656$, it implies that the model did not deviate from what is happening in the real world.

As shown in Table 3, only the Admission Test Score of LEFT Takers made a unique statistically significant contribution to the model and predictor of the likelihood to pass the LEFT, with a $p < .026$, recording an odds ratio of 1.804. Statistically, the likelihood that the LEFT average score will increase by approximately 2 points for each 1-point increase in the admission test score is approximately 2. The result of the study implies that colleges offering BS Fisheries program shall consider looking at the admission test score of the college entrants and make it as part of the admission requirement to get a higher admission test score. Through this, colleges will have a better chance that the students entering the program have a greater chance of passing the LEFT in the future. The result aligned with several studies that concluded that admission test as predictor to the board examination performance of takers [22, 9, 23, 24, 25].

In addition, the academic performances of LEFT takers during their high school did not significantly contribute to the LEFT performance. This result was a deviation of studies that high school grades are also predictors to board examination results [12, 9]. However, this result supports the study conclusions of studies that high school academic performance is not a predictor of licensure examination results [21, 22]. This implies that grading students is arbitrary and depends upon how the instructors/teachers exercise their academic freedom. This also tells that the basic education curriculum prepares students to become prepared in college not for licensure examination, and it is the responsibility of the higher education institutions to prepare college students for licensure examination and for work.

4. Conclusions

The results of the study have been used to draw these conclusions. Most LEFT students enter the program with an average score on the entrance exam. The average of the students who

entered the Bachelor of Science in fisheries was 89-91 in terms of their academic performance. From 2015-2019, there were 40 first time LEFT takers failed in the exam and 22 of them successfully passed the exam. This study posited that the admission test scores, and LEFT results are correlated with each other, and high school grade and LEFT results are significantly related to each other. Furthermore, the academic performance of LEFT takers significantly related to LEFT results. Finally, the research study concluded that only the admission test score had the likelihood to influence the LEFT results.

Based on the results and conclusion of this study, the researcher is suggesting that higher education institutions offering programs with board examination, particularly in the BS Fisheries program to consider accepting students with at least good, or better admission test scores since the result of the study confirmed that admission test score had the likelihood to influence the licensure examination result. It is also recommended for further investigation to use the result of the study and utilize other research designs. The study is only limited to admission test scores and high school grades; researchers may consider studying the mediating effect of review programs conducted by higher education institutions to the licensure examinations.

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