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Teachers' perspectives toward digital game-based learning: Determining role of digital citizenship skills of public elementary school teachers of Bambang II District

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Abstract

This study analyzed the way Digital Citizenship Skills relate to Public Elementary School Teachers' perceptions about Digital Game-Based Learning (DGBL) in Bambang II District, Division of Nueva Vizcaya for the academic year 2025-2026. It identified the level of Digital Citizenship Skills of the Teachers; measured Teachers' views toward DGBL in terms of knowledge, perceptions, and attitudes; and tested the relationship between these measures. Quantitative research methodology was applied using the descriptive-correlational method. There were 103 public elementary school teachers who were sampled by means of stratified random sampling. Data was collected utilizing two modified instruments: the Digital Citizenship Skills Scale developed on Mike Ribble's framework and a Digital Game-Based Learning questionnaire developed on the Technology Acceptance Model. Statistical tools such as Mean, Standard Deviation, and Spearman's rho Correlation Coefficient were utilized to analyze the data. Teachers were shown to possess a high degree of Digital Citizenship Skills and exhibit positive perspectives toward the utilization of Digital Game-Based Learning in Education. Digital Etiquette had the highest mean, and Digital Literacy the lowest mean of the four dimensions of Digital Citizenship Skills. Teachers were also shown to be at a high level of perception and attitudes toward Digital Game-Based Learning, though there is slight variation among the three. Further, each of the four dimensions of Digital Citizenship Skills was found to be significantly positively related to Teachers' perspectives toward Digital Game-Based Learning; thus, emphasizing the need to strengthen Teachers' Digital Citizenship Competency so as to support effective technology integration in elementary education.

Keywords: digital citizenship skills, digital game-based learning, teachers' perspectives

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1. Introduction

Education in the 21st century is increasingly shaped by the integration of technology into teaching and learning, where learners are expected not only to acquire knowledge but also to develop skills necessary for navigating a digital world. Digital Game-Based Learning (DGBL) has emerged as a dynamic approach that blends educational content with the engaging elements of digital games, making learning more interactive, meaningful, and learner-centered. At the same time, digital citizenship skills have become essential, as they guide learners and teachers in using technology responsibly, ethically, and effectively. Together, DGBL and digital citizenship reflect the evolving nature of education, where engagement and responsibility must go hand in hand to prepare individuals for lifelong learning in a digital society.

Globally, the integration of DGBL into education has gained significant attention due to its potential to enhance student motivation, participation, and academic achievement. Studies have shown that game-based environments can support active learning, improve problem-solving skills, and encourage collaboration among learners (Wang & Zhao, 2020). DGBL also aligns with constructivist learning principles, where learners actively construct knowledge through experience and interaction. However, the effectiveness of DGBL depends largely on how teachers design, facilitate, and manage these digital learning experiences. Teachers play a critical role in ensuring that game-based activities are not only engaging but also aligned with curricular goals and learning outcomes.

In the same global context, the concept of digital citizenship has become increasingly relevant as technology becomes deeply embedded in everyday life. Digital citizenship encompasses the knowledge, skills, and attitudes required to use digital tools responsibly, including aspects such as online safety, ethical behavior, digital communication, and information literacy (Ribble, 2019). For educators, digital citizenship is not only a personal competency but also a professional responsibility, as they are expected to model appropriate digital behavior and guide students in becoming responsible digital users. As DGBL often involves online platforms, interactive tools, and collaborative environments, teachers' digital citizenship skills become crucial in managing digital risks and promoting positive learning experiences.

The global emphasis on integrating technology in education is strongly supported by the United Nations' Sustainable Development Goal 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (United Nations, 2015). SDG 4 highlights the importance of equipping both learners and educators with relevant skills for the digital age, including the effective use of information and communication technologies. In this regard, DGBL serves as an innovative strategy to enhance learning engagement, while digital citizenship ensures that such technological integration is carried out responsibly and inclusively. Together, they contribute to the development of future-ready learners and educators who can thrive in a rapidly changing world.

In the Philippine context, the push for digital transformation in education has been intensified by the challenges brought about by the COVID-19 pandemic. The Department of Education has implemented various digitalization initiatives, such as the DepEd Commons, Learning Management Systems, and capacity-building programs for teachers, to support flexible and technology-enhanced learning (Department of Education, 2020). These initiatives have opened opportunities for the integration of DGBL in classrooms through the use of gamified applications, interactive quizzes, and digital simulations. As a recipient of these initiatives, the researcher has observed how teachers utilize platforms such as Quizizz, Kahoot, and other interactive tools to increase learner engagement and participation, especially in remote and blended learning environments. These experiences

highlight both the potential and the challenges of integrating DGBL in real classroom settings.

Despite these advancements, the successful implementation of DGBL in public elementary schools remains dependent on teachers' readiness, competence, and attitudes toward technology. The National Research Agenda for Teacher Education emphasizes the importance of developing teacher quality and professional competencies to respond to emerging educational demands (Commission on Higher Education, 2018). It recognizes that teachers must be equipped not only with pedagogical knowledge but also with digital skills and ethical understanding to effectively integrate technology into instruction. In this light, digital citizenship becomes a foundational competency that supports teachers in making informed decisions about the use of digital tools, including game-based learning strategies. Furthermore, the Department of Education Research Agenda underscores the need to explore innovative teaching approaches, teacher development, and the effective use of technology in improving learning outcomes (Department of Education, 2022). It highlights that teachers' professional growth and well-being are closely linked to their ability to adapt to new teaching modalities. Integrating DGBL requires not only technical skills but also a strong sense of responsibility in managing digital environments, protecting student data, and promoting respectful online interactions. Thus, understanding teachers' digital citizenship skills provides valuable insights into their capacity to adopt and sustain innovative practices such as DGBL.

At the institutional level, the College of Teacher Education Research and Development Agenda of Nueva Vizcaya State University emphasizes the importance of responsive and context-based research that addresses current educational challenges. It promotes the development of innovative pedagogies, inclusive practices, and evidence-based teaching strategies that are relevant to local communities. In the context of Bambang II District, the integration of DGBL must consider the availability of resources, the technological readiness of schools, and the cultural context of learners. Teachers in public elementary schools often navigate limitations such as unstable internet connectivity, limited devices, and varying levels of digital literacy among students, which affect how DGBL is implemented in practice.

From a contextual and experiential perspective, the researcher has observed that while some teachers are enthusiastic about using gamified tools to enhance learning, others remain hesitant due to limited training or concerns about classroom management and student behavior in digital environments. Instances of improper use of technology, such as distraction during online activities or lack of awareness of digital etiquette, further emphasize the need for strong digital citizenship skills among both teachers and learners. These lived experiences demonstrate that the integration of DGBL is not merely a matter of access to technology but also of developing the competencies needed to use it effectively and responsibly. However, despite the growing body of research on DGBL and digital citizenship, there remains a significant gap in understanding how these two variables are interconnected, particularly at the local level. In Bambang II District, Division of Nueva Vizcaya, there is limited empirical evidence examining how public elementary school teachers' digital citizenship skills influence their perspectives toward DGBL. Existing studies often focus on student outcomes or general technology integration, with less attention given to teachers' competencies and attitudes in specific contexts. Moreover, challenges such as limited access to resources, insufficient professional development, and difficulties in integrating DGBL into the curriculum continue to affect its adoption in public schools.

Given these considerations, there is a need to explore how teachers' digital citizenship skills shape their perceptions, acceptance, and implementation of DGBL. Understanding this relationship is essential in identifying areas for improvement, designing targeted interventions, and supporting teachers in effectively integrating innovative teaching strategies. This study, therefore, seeks to determine the role of digital citizenship skills in shaping the perspectives of public elementary school teachers toward Digital Game-Based Learning in Bambang II District, Division of Nueva Vizcaya. By providing empirical evidence grounded in the local context, the study aims to contribute to the development of responsive educational programs and policies that enhance both teacher competence and student learning experiences in the digital age.

2. Related Literature

This study is anchored on several interrelated theoretical foundations that explain how teachers develop the competence, confidence, and willingness to integrate technology into their instructional practices. In the rapidly evolving digital age, teachers are expected not only to possess technical knowledge but also to demonstrate responsible, ethical, and effective use of technology in educational settings. The integration of digital technologies into classroom instruction requires teachers to develop competencies that support innovative and learner-centered teaching approaches, particularly Digital Game-Based Learning (DGBL). The study assumes that teachers' digital citizenship skills significantly influence their readiness to adopt and implement DGBL strategies within the teaching-learning process. In this context, digital competence is viewed not merely as the ability to operate technological tools but as part of a broader process of professional growth, adaptability, responsible digital behavior, and instructional innovation.

The independent variable of the study, digital citizenship skills, is primarily grounded in the Digital Citizenship Framework developed by Mike Ribble. Ribble (2015) defines digital citizenship as the responsible, ethical, safe, and effective use of technology in digital environments. According to Ribble, digital citizenship encompasses nine major elements: digital access, digital commerce, digital communication, digital literacy, digital etiquette, digital law, digital rights and responsibilities, digital health and wellness, and digital security. These elements are organized under the three broader themes of respect, educate, and protect, which collectively guide individuals in becoming responsible and competent users of technology.

Within the context of this study, Ribble's framework provides a comprehensive foundation for assessing teachers' digital citizenship skills and understanding how these competencies influence their instructional practices. Teachers who demonstrate strong digital citizenship are more likely to utilize technology responsibly, communicate effectively in digital spaces, protect themselves and their learners from online risks, and promote ethical behavior in technology use. More importantly, teachers with strong digital citizenship skills are expected to become more open to innovative teaching strategies, such as DGBL, because they possess the confidence and competence necessary to navigate digital learning environments effectively.

Digital literacy, one of the major components of Ribble's framework, is particularly relevant in this study because it involves the ability to locate, evaluate, create, and communicate information using digital technologies. Teachers who possess high levels of digital literacy are more likely to understand how educational technologies, including digital games, can be integrated meaningfully into classroom instruction. Similarly, digital communication and digital etiquette contribute to teachers' ability to facilitate respectful and productive online interactions among learners. Digital security and digital law, on the other hand, emphasize the importance of safe and ethical technology use, which is essential when implementing digital instructional tools in educational settings.

The study is further supported by Albert Bandura's Social Cognitive Theory, which explains that individuals learn behaviors, attitudes, and skills through observation, interaction, modeling, and self-reflection. According to Bandura, learning occurs within a social context where cognitive, behavioral, and environmental factors interact continuously. In educational settings, teachers serve as models of behavior for learners, particularly in the use of technology and digital tools. Teachers who practice responsible digital behavior influence students to adopt similar attitudes and practices toward technology use.

Social Cognitive Theory emphasizes the importance of self-efficacy, or an individual's belief in their ability to perform specific tasks successfully. Teachers who are confident in their digital citizenship skills are more likely to experiment with innovative instructional technologies and integrate them into classroom teaching. Through observation and interaction, students also develop responsible digital behaviors by emulating teachers who demonstrate ethical and effective technology use. Thus, Social Cognitive Theory reinforces the idea that teachers' digital citizenship skills not only influence their own teaching practices but also shape learners' attitudes and behaviors in digital environments.

Another important theoretical foundation of the study is the Technological Pedagogical Content Knowledge (TPACK) framework developed by Punya Mishra and Matthew J. Koehler. The TPACK framework highlights the interconnected relationship among technology, pedagogy, and content knowledge in effective teaching. According to the framework, teachers must possess not only knowledge of subject matter and instructional methods but also the ability to integrate technology effectively into classroom instruction. Effective technology integration occurs when teachers understand how technological tools can support pedagogical goals and enhance learners' understanding of content.

In the context of this study, digital citizenship skills serve as a foundational component that strengthens teachers' TPACK competencies. Teachers who demonstrate responsible and informed technology use are more capable of integrating digital tools, including educational games, into instructional activities effectively. Digital Game-Based Learning requires teachers to align technological tools with appropriate teaching strategies and curriculum objectives. Therefore, teachers' understanding of digital responsibility, online safety, communication, and digital literacy contributes significantly to their ability to implement DGBL meaningfully.

The TPACK framework further suggests that successful integration of DGBL requires teachers to understand not only how digital games function technically but also how these games can support instructional goals, learner engagement, and classroom interaction. Teachers must be able to select appropriate games, facilitate learning activities, assess student performance, and manage classroom dynamics during game-based learning sessions. Consequently, teachers who possess strong digital citizenship skills are more likely to demonstrate competence in integrating educational games effectively because they are more confident and knowledgeable in navigating digital learning environments.

For the dependent variable, the study draws heavily from the Technology Acceptance Model (TAM) developed by Fred Davis in 1989. TAM explains how individuals come to accept and use new technologies. According to the model, two major factors influence technology adoption: perceived usefulness and perceived ease of use. Perceived usefulness refers to the degree to which individuals believe that using a particular technology will enhance their performance, while perceived ease of use refers to the extent to which individuals believe that using the technology will require minimal effort.

Within the context of Digital Game-Based Learning, TAM explains how teachers evaluate digital games as instructional tools. Teachers who perceive DGBL as useful in improving student engagement, participation, motivation, and academic achievement are more likely to adopt it in classroom instruction. Likewise, teachers who perceive digital games as easy to implement and manage are more likely to integrate them into their teaching practices. Teachers' perspectives toward DGBL are therefore influenced by how beneficial, practical, and manageable they perceive digital games to be within educational settings.

The Technology Acceptance Model is particularly relevant because the successful implementation of DGBL depends largely on teachers' willingness to adopt technological innovations. Even when digital resources are available, teachers may hesitate to use them if they perceive them as difficult, ineffective, or time-consuming. Conversely, teachers who possess strong digital citizenship skills may develop more positive attitudes toward DGBL because they are more familiar and comfortable with digital technologies. Their competence in navigating digital environments reduces technological anxiety and increases their confidence in utilizing game-based instructional tools.

The study is also informed by the Diffusion of Innovations Theory developed by Everett Rogers. This theory explains how new ideas, practices, and technologies spread within a social system over time. According to Rogers, individuals adopt innovations at different rates depending on factors such as perceived advantages, compatibility, complexity, observability, and trialability. The theory categorizes adopters into innovators, early adopters, early majority, late majority, and laggards based on their willingness to embrace innovations.

In educational settings, teachers may adopt Digital Game-Based Learning at varying rates depending on their

exposure to educational technologies, peer influence, institutional support, and perceptions of the effectiveness of DGBL. Teachers who observe positive outcomes from using digital games in instruction are more likely to adopt these practices themselves. Similarly, teachers who work in supportive school environments where innovation and technology integration are encouraged are more likely to embrace DGBL strategies.

Diffusion of Innovations Theory further explains that teachers' attitudes toward technological innovations are influenced by social interactions and professional communities. Teachers often rely on colleagues, administrators, and training opportunities when deciding whether to adopt new instructional approaches. Thus, teachers who possess strong digital citizenship skills may become early adopters or advocates of DGBL because they are more prepared to explore, evaluate, and implement digital innovations in teaching.

By integrating these theoretical frameworks, the study presents a comprehensive understanding of the relationship between digital citizenship skills and teachers' perspectives toward Digital Game-Based Learning. Ribble's Digital Citizenship Framework and Bandura's Social Cognitive Theory explain how responsible digital behavior and digital competence are developed and modeled within educational settings. The TPACK framework connects these competencies to effective instructional practices by emphasizing the integration of technology, pedagogy, and content knowledge. On the other hand, the Technology Acceptance Model and Diffusion of Innovations Theory explain how teachers evaluate, accept, and adopt technological innovations such as DGBL.

Collectively, these theories suggest that teachers who possess strong digital citizenship skills are more likely to perceive Digital Game-Based Learning as useful, manageable, effective, and appropriate for classroom instruction. Teachers who are digitally competent and responsible are generally more open to technological innovations because they possess the knowledge, confidence, and adaptability necessary to integrate digital tools effectively into teaching practices. These competencies allow teachers to maximize the educational potential of digital games while maintaining ethical, safe, and responsible technology use.

The conceptual framework of the study therefore illustrates a clear relationship between the independent variable and the dependent variable. Digital citizenship skills represent the foundational competencies of teachers in navigating digital environments responsibly and effectively, while teachers' perspectives toward Digital Game-Based Learning reflect their readiness and willingness to adopt innovative instructional approaches. The framework assumes that higher levels of digital citizenship skills lead to more positive perspectives toward DGBL, which consequently increases the likelihood of integrating digital game-based strategies into classroom instruction.

Ultimately, the study highlights the importance of strengthening teachers' digital competencies as a pathway toward improving instructional innovation and promoting engaging, learner-centered teaching practices in the digital age. As educational systems continue to integrate technology into classroom instruction, teachers must develop not only technical proficiency but also responsible digital behavior, ethical awareness, and confidence in using educational technologies. By enhancing teachers' digital citizenship skills, schools and educational institutions can better prepare educators to implement innovative instructional approaches such as Digital Game-Based Learning, thereby improving student engagement, participation, and overall learning experiences in contemporary education.

3. Methodology

Research Design - This study employed a quantitative research design, employing descriptive-correlational procedure. This design is selected as the most appropriate method to determine the role of digital citizenship skills in the perspectives of public elementary school teachers toward Digital Game-Based Learning (DGBL). By utilizing a correlational approach, the researcher can systematically analyze the relationship between the independent variable (Digital Citizenship Skills) and the dependent variable (Teachers' Perspectives) without manipulating either factor.

According to Siedlecki (2020), a descriptive research design is effective in gathering specific, objective data

about the characteristics or behaviors of a group, allowing researchers to document and analyze the conditions that exist within a population. In this context, the descriptive aspect enable the researcher to describe the current levels of teachers' digital citizenship and their knowledge, perceptions, and attitudes toward DGBL. Furthermore, as highlighted by Villaabrille (2024), a survey instrument provides the necessary means to evaluate respondents' competencies and views regarding a particular topic. The correlational component of this design allow the researcher to go beyond mere description by examining whether a significant statistical relationship exists between the educators' digital citizenship and their readiness to adopt game-based pedagogy. This design follows the logic of the Research Paradigm, moving from data collection to statistical analysis to determine if one variable significantly correlates with the other. The collected data were analyzed using statistical tools such as the Mean for descriptive purposes and Spearman's Rank Correlation to establish the relationship between the variables. These findings serve as the empirical basis for the proposed Educational Management Intervention, ensuring that the resulting strategies for LAC Sessions are tailored to address the specific needs and digital readiness identified through the research.

Research Environment - This study was conducted in Bambang II District, one of the administrative educational districts under the Schools Division of Nueva Vizcaya. The district is composed of 14 public elementary schools: Abian Elementary School, Abinganan Elementary School, Almaguer North Elementary School, Almaguer South Elementary School, Bambang East Elementary School, Bambang North Central Elementary School, Dullao Elementary School, Labni Elementary School, Mabuslo Elementary School, Macate Elementary School, San Antonio North Elementary School, San Antonio South Elementary School, San Fernando Integrated School, and Sto. Niño Primary School. These institutions are situated across various barangays in the municipality of Bambang, a first-class municipality known for its strategic location and diverse socio-economic landscape. As a recipient of the Department of Education (DepEd) digitalization programs, the district serves as a vital hub for implementing technology-driven initiatives. This includes the deployment of various DepEd-endorsed tools and computerization packages intended to modernize the instructional environment. The district operates under the direct supervision of the Schools Division Office, ensuring that all schools align with the national mandates for inclusive and quality education as outlined in Sustainable Development Goal (SDG) 4.

The environment in Bambang II District reflects the unique characteristics of the Philippine public school system, where teachers navigate the transition from traditional pedagogy to digital integration. While the district benefits from centralized digitalization efforts, it also presents a realistic context where factors such as teacher readiness and digital citizenship vary across different school sizes and locations. This setting is particularly relevant for the study as it allows for an investigation into how these varied conditions influence the teachers' perspectives toward innovative strategies like Digital Game-Based Learning (DGBL). By encompassing all 164 teachers across the 14 schools in the district, the research environment provides a comprehensive and inclusive landscape. This allows the study to identify district-wide patterns in digital citizenship skills and DGBL readiness, providing empirical data that can be used to develop an Educational Management Intervention specifically tailored for the district's School Learning Action Cell (LAC) sessions.

Our Bambang II District of the Schools Division of Nueva Vizcaya has achieved several remarkable accomplishments in both sports and academic competitions. The Bambang II district earned the 1st Runner-Up title in the Women's Volleyball category event during the Bambang Educators Sports Tournament and also secured the 2nd Runner-Up award in the Men's Basketball category of the same tournament. In the 2025 NVPAA Meet, Bambang II attained the distinction of 2nd Runner-Up in the Secondary Level and 4th Runner-Up overall, while also garnering the 1st Runner-Up award in the Para games. In athletics, the Bambang II district proudly achieved 3rd Runner-Up during the 2023 Provincial Athletic Meet. Moreover, Bambang II demonstrated superiority in academic and scientific endeavors by being acknowledged the Overall Champion in the Division Science and Technology Fair held at the Bambang Municipal Auditorium in December 2024. These accomplishments replicate the district's pledge to excellence, teamwork, sportsmanship, and academic achievement

Respondents of the Study - The respondents of the study are the public elementary school teachers within

Bambang II District, Schools Division of Nueva Vizcaya, during the School Year 2025–2026. The study encompasses a total population of 140 teachers across 14 educational institutions. The sample size for this investigation is determined using Raosoft, an online sample size calculator, to ensure statistical power and reliability. To achieve an appropriate representation of the district's teaching force, a multistage sampling procedure is employed. This method ensures that each school, regardless of size, is proportionately represented in the final data set, allowing for a comprehensive assessment of the digital citizenship skills and perspectives toward digital game-based learning across the entire district. These respondents are chosen to provide the primary data needed to determine the correlation between an educator's digital competency and their readiness to integrate modern pedagogical tools. Their participation is vital in identifying the specific training needs that was addressed in the proposed Educational Management Intervention designed for LAC Sessions.

Sampling Procedure - To ensure a statistically sound and representative selection of participants from the total population of 140 educators, this study employed a multistage sampling procedure. This approach is selected to maintain the integrity of the data across the various school sizes and locations within Bambang II District. In the first stage, the researcher utilized a stratified random sampling, where each of the 14 public elementary schools in the district serves as a distinct stratum. This ensures that every school, from large central schools to smaller primary schools, is proportionately represented in the study. In the second stage, simple random sampling was applied within each stratum to select the specific teacher-respondents, ensuring that every faculty member has an equal and independent chance of being included in the investigation. The sample size was determined using Raosoft, an online sample size calculator. By setting the margin of error at 5% and the confidence level at 95% for the total population of 140, the researcher ensures that the sample is statistically reliable and sufficient for conducting correlational analysis. This rigorous method provides a well-rounded perspective that accounts for the diverse teaching experiences and digital readiness levels found across the entire district. Throughout the sampling process, the researcher adheres to strict ethical research standards. After obtaining the necessary permissions from the District Supervisor and School Heads, the researcher ensures that all selected respondents provide informed consent. Participants were briefed on the study's purpose and are assured of their anonymity and the confidentiality of their responses. The sampling was conducted objectively and without bias, providing a credible foundation for the development of the Educational Management Intervention tailored for LAC Sessions.

Research Instruments - This study utilized two primary research instruments to gather quantitative data regarding the variables identified in the research paradigm. The research instrument focusing on Digital Citizenship Skills and Perspectives on Digital Game-Based Learning. Before the main study, the test underwent validation by an expert in literacy to ensure content relevance and alignment with the study's objectives. A pilot test was conducted at Nueva Vizcaya State University at Graduate School. The first instrument is the Digital Citizenship Skills Scale. This tool is anchored on Ribble's (2015) Digital Citizenship Model developed and validated by Vadil and Tallungan (2023) and is designed to measure the teachers' proficiency across five key dimensions: Digital Literacy, Digital Ethics, Digital Etiquette, Digital Security, and Digital Health and Wellness. This instrument determined the independent variable (IV) of the study, providing an objective measure of the teachers' responsible and ethical navigation of the digital environment. The second instrument is the Perspectives on Digital Game-Based Learning Questionnaire. This tool, adapted from established studies on the Technology Acceptance Model (TAM), is specifically designed to assess the dependent variable (DV). It is divided into three sub-sections: Knowledge, Perceptions, and Attitudes regarding DGBL. The items are specifically tailored to reflect the use of DepEd-endorsed tools such as Minecraft Education Edition and Microsoft 365.

Data Gathering Procedure - The data gathering procedure for this study follows a systematic and ethical approach, strictly adhering to the protocol established during the proposal defense. The researcher developed and refined the research instruments, specifically the Digital Citizenship Skills Scale and the Perspectives on DGBL Questionnaire, ensuring they align with the theoretical frameworks of Ribble (2015) and the Technology Acceptance Model (TAM). Before the full implementation of the study, the research instruments were subjected to pilot testing with a group of teachers from a nearby district not included in the study. The purpose of the pilot test was to assess the clarity, reliability, and validity of the instrument using Cronbach's Alpha. Necessary revisions

were made to improve question phrasing, sequencing, and response format based on the feedback received. The finalized versions were then prepared in printed and electronic forms.

The researcher sought and obtained the necessary approvals by presenting an endorsement letter from the Dean of the College of Teacher Education to the Schools District Office of Bambang II to secure official permission. The researcher coordinated with the District Supervisor of Bambang II and the school heads of all 14 public elementary schools in the district to schedule the data collection activities and ensure administrative alignment. The sample size, determined using Raosoft to ensure statistical reliability for the total population of 140 teachers, was engaged through a multistage sampling procedure. Prior to the distribution of questionnaires, the researcher conducted a brief orientation. During this session, the purpose, objectives, and significance of the study were clearly explained. Informed consent forms were distributed and signed before the respondents proceeded. Questionnaires were administered using a hybrid approach—through face-to-face distribution and online submission via Google Forms—depending on the preference of the participants. Ample time was allotted for respondents to complete the instrument, with the researcher available to clarify any queries.

Data Analysis. After completion, the accomplished questionnaires were personally collected or retrieved via secure electronic submission. The researcher immediately checked the responses for completeness and consistency. All collected data were coded, tabulated, and encoded into a statistical software program. In accordance with the agreements, the Mean was used for descriptive analysis, while Spearman's Rank Correlation was employed to determine the relationship between digital citizenship skills and perspectives toward DGBL. Throughout the data gathering process, the researcher adhered to ethical research standards and the provisions of Republic Act No. 10173 (Data Privacy Act of 2012). Respondents were informed about their rights, including the voluntary nature of their participation and the right to withdraw at any time. Raw data were handled with utmost confidentiality, and identifying information was removed to maintain anonymity. Findings are reported in aggregate form only to ensure that participation does not affect the professional standing of the teachers. Upon completion, respondents were formally thanked and informed about how their contributions would help develop the proposed Educational Management Intervention for LAC Sessions.

Statistical Treatment of Data - The data collected for this study was systematically tabulated and analyzed using statistical software to ensure a robust and accurate interpretation of the relationship between digital citizenship skills and perspectives toward digital game-based instruction. In accordance with the panel's directives, the following statistical treatments were employed:

- **Weighted Mean.** This tool was used to calculate the average responses for both the independent variable (Digital Citizenship Skills) and the dependent variable (Perspectives toward DGBL). It provided a measure of the central tendency for the teachers' knowledge, perceptions, and attitudes, allowing the researcher to describe the overall levels of competency and acceptance within the district.

- **Spearman's Rank Correlation (Spearman's Rho).** As specifically requested by the panel to address the correlational nature of the study, this non-parametric test was used to determine the strength and direction of the significant relationship between the dimensions of digital citizenship skills and the teachers' overall perspectives toward DGBL. This revealed if a higher level of digital citizenship is associated with more positive views toward game-based pedagogy.

4. Results and Discussion

The rapid integration of digital technologies in education has significantly reshaped teaching and learning processes, particularly in the context of twenty-first-century classrooms. Among the emerging pedagogical innovations, Digital Game-Based Learning (DGBL) has gained increasing attention for its potential to enhance student engagement, motivation, and meaningful learning experiences. However, the successful implementation of such technology-enhanced instructional strategies largely depends on teachers' competencies, particularly their level of digital citizenship skills. Digital citizenship encompasses responsible, ethical, and effective use of

technology, which includes digital literacy, digital etiquette, digital communication, digital security, and digital responsibility. In this regard, teachers' ability to navigate the digital environment responsibly may directly influence their perceptions, acceptance, and readiness to integrate DGBL into their instructional practices.

Anchored on this premise, the present study primarily aimed to investigate the influence of digital citizenship skills on the perceptions of public elementary school teachers regarding Digital Game-Based Learning during the School Year 2025–2026. Specifically, it sought to examine how teachers' competencies in digital citizenship relate to their knowledge, perceptions, and attitudes toward the use of digital games as instructional tools. In doing so, the study also aimed to contribute to the growing body of literature that emphasizes the importance of teacher readiness in the successful integration of educational technologies in public school systems. More specifically, this research was guided by the following objectives. First, it aimed to determine the level of digital citizenship skills among public elementary school teachers in terms of its key dimensions, such as digital etiquette, digital literacy, digital communication, and digital security. Second, it sought to assess teachers' perceptions of Digital Game-Based Learning in terms of knowledge, perception, and attitude. Third, it aimed to examine whether there is a significant relationship between teachers' digital citizenship skills and their perceptions toward DGBL. Lastly, based on the findings, the study intended to propose an educational management intervention plan that could enhance teachers' digital citizenship competencies and improve their readiness to implement DGBL effectively in classroom instruction.

Methodologically, the study employed a quantitative research design, specifically utilizing a descriptive-correlational approach. This design was deemed appropriate as it allows for the systematic description of variables and the examination of relationships among them without manipulating any conditions. The study was conducted among 103 public elementary school teachers from Bambang II District, Nueva Vizcaya Province. The respondents were selected through stratified random sampling to ensure proportional representation from different schools within the district, thereby enhancing the reliability and generalizability of the findings. Data collection was facilitated using two standardized research instruments. The first was the Digital Citizenship Skills Scale, adapted from the framework developed by Ribble (2015), which measures the extent to which teachers demonstrate responsible and competent use of digital technologies across multiple domains. The second instrument was the Digital Game-Based Learning Questionnaire, which was anchored on the Technology Acceptance Model (TAM). This tool assessed teachers' knowledge, perceptions, and attitudes toward the use of digital games as an instructional strategy. Both instruments were administered to the respondents, and data were collected, encoded, and analyzed using appropriate statistical tools.

For data analysis, descriptive and inferential statistical methods were employed. Mean and standard deviation were used to describe the level of digital citizenship skills and perceptions of teachers toward DGBL. Meanwhile, Spearman's rho correlation coefficient was utilized to determine the strength and direction of the relationship between digital citizenship skills and teachers' perceptions of Digital Game-Based Learning. These statistical techniques provided a comprehensive understanding of both the descriptive characteristics of the data and the relational dynamics between the variables under investigation.

The findings of the study revealed several significant insights. First, in terms of digital citizenship skills, the teachers demonstrated a relatively strong level of competency, with an overall mean score of 3.19 and a standard deviation of 0.69. This result indicates that the respondents generally exhibit consistent practices in responsible digital behavior. Among the different dimensions, digital etiquette obtained the highest mean score, suggesting that teachers are particularly mindful of appropriate and respectful behavior in online environments. This includes proper communication, respectful interaction, and adherence to ethical standards when using digital platforms. Conversely, digital literacy recorded the lowest mean score, indicating that while teachers are generally capable of using digital tools, there are still gaps in their ability to effectively utilize more advanced digital technologies and critically engage with digital content. This finding suggests a need for further training and capacity-building programs focused on enhancing teachers' technical and analytical digital skills.

Second, regarding teachers' perceptions of Digital Game-Based Learning, the results showed an overall mean score of 3.37 with a standard deviation of 0.54, interpreted as "high." This indicates that teachers generally hold positive views toward the use of digital games as an instructional strategy. Among the indicators, perception obtained the highest mean (3.49), followed by attitude (3.41), while knowledge obtained the lowest mean (3.20). These results imply that although teachers are generally receptive and supportive of DGBL, their actual understanding and conceptual knowledge of how to effectively integrate digital games into instruction remain relatively limited. This gap between positive disposition and limited knowledge highlights the need for targeted professional development programs that focus not only on attitudes but also on practical application and pedagogical integration.

Third, the correlational analysis revealed that all dimensions of digital citizenship skills are significantly and positively related to teachers' perceptions of Digital Game-Based Learning. Among these, digital etiquette showed the strongest relationship, suggesting that teachers who demonstrate appropriate and responsible online behavior are more likely to have favorable perceptions of DGBL. On the other hand, digital security showed the weakest but still significant relationship with DGBL perceptions. Overall, the results suggest that higher levels of digital citizenship skills are associated with more positive perceptions, greater acceptance, and increased willingness to integrate digital games into classroom instruction. This finding supports the notion that digital competence is a critical determinant of teachers' openness to educational innovation.

Despite the generally positive findings, the study also revealed an important concern. While teachers in Bambang II District express optimism toward Digital Game-Based Learning, their actual experience with its implementation remains limited. This limitation is primarily attributed to insufficient digital literacy skills, which affects their confidence in using technology and their readiness to incorporate digital games into teaching practices. In many cases, even if teachers recognize the value of DGBL, the lack of technical expertise and pedagogical training serves as a barrier to actual classroom implementation.

In response to these findings, the study proposes the implementation of a Learning Action Cell (LAC)-based intervention program as a strategic educational management initiative. The LAC approach provides a collaborative professional development platform where teachers can engage in continuous learning, peer collaboration, and practical training sessions. Through this program, teachers can enhance their digital citizenship competencies, particularly in digital literacy and digital integration skills, while also gaining hands-on experience in using Digital Game-Based Learning tools. The proposed intervention is expected to bridge the gap between positive perceptions and actual instructional practice, thereby promoting more effective and meaningful integration of technology in elementary education.

In conclusion, this study underscores the critical role of digital citizenship skills in shaping teachers' perceptions and readiness to adopt innovative instructional strategies such as Digital Game-Based Learning. While teachers demonstrate generally strong digital citizenship competencies and favorable attitudes toward DGBL, gaps in digital literacy and practical application remain key challenges. Addressing these gaps through structured professional development programs, such as Learning Action Cells, is essential for fostering a more technologically competent and innovation-ready teaching workforce. Ultimately, strengthening teachers' digital citizenship skills is not only beneficial for their professional growth but also vital for enhancing the quality of teaching and learning in contemporary education systems.

5. Conclusions

Based on the significant findings, the study concludes the following:

- Public Elementary School Teachers in Bambang II District have very good fundamentals of Digital Citizenship to support the appropriate implementation of Digital Game Based Learning in the Classroom. Public Elementary School Teachers' strength in digital etiquette, digital access, and digital health and wellness show their understanding of ethics and balance with respect to technology use; however,

differences in digital literacy and digital security suggest the need for additional training in capacity development.

- Elementary school teachers in Bambang II District generally have a favorable disposition toward digital game-based learning, indicated by the relatively high mean scores for perceptions and attitudes toward digital game-based learning. Teachers' knowledge about digital game-based learning was somewhat less than their perceptions/attitudes, with a small amount of greater variance in knowledge, suggesting that even though teachers understand the potential of digital game-based learning and are inclined to use it, many could benefit from additional knowledge of the theoretical foundations of digital game-based learning and ways to incorporate them into their teaching practices. In addition to being open to new, innovative digital instructional strategies, teachers will likely require ongoing professional development to improve their ability to implement these strategies effectively in their classrooms.

- Digital Citizenship Skills Influence Teachers' Views on Digital Games as a Learning Tool. As teachers exhibit digital citizenship through their responsible and ethical use of digital technology, they will be more likely to see digital games as tools for learning and not just for fun. Strengthening Teacher's Digital Citizenship will help build the confidence and preparedness to incorporate innovative digital teaching methods.

- Improving teachers' digital literacy and cyber safety awareness will help in developing teachers' digital citizenship. This, in turn, will promote teachers' use of Digital Game-Based Learning (DGBL) in a meaningful way. A positive perception alone is insufficient; teachers need continued education/training with both guided practice and collaborative support to implement this successfully. Therefore, a structured and on-going Professional Development program, such as a Learning Action Cell Plan, is needed to provide for the "know-how" to connect learning to classroom application.

Recommendations - Based on the significant findings and conclusions drawn, the study recommends the following:

- Teachers are able to continually develop their digital literacy and cybersecurity skills through continuous professional development programs so that they will have greater confidence when using Digital Game Based Learning. School administrators and curriculum planners can assist in providing a structure for training, and sufficient technology support to help continue the growth of the digital citizenship competencies for teachers. Future researchers could do similar research in different school districts and possibly add other variables (i.e., years of teaching, amount of training received, level of technology available) to further explore factors affecting the development of digital citizenship within an educational environment.

- Teachers are also encouraged to continue developing their knowledge and technical skills through ongoing professional development by using digital games to teach within the classroom. The school administration and curriculum developers may also assist teachers through providing formalized training programs; joint workshops; mentoring; and other types of collaboration to help teachers use digital game-based approaches to support curriculum objectives and encourage students to practice digital citizenship. Researchers may develop future studies using a similar model in other school districts or analyze different variables (i.e., access to technology; instructional supports; student achievement) to better understand what factors contribute to successful implementation of digital game-based learning in elementary education.

- Teachers are encouraged to continue to develop their own digital citizenship competencies, especially in regards to etiquette when using digital technologies, how they communicate online, and appropriate use of digital technologies in order to facilitate the successful inclusion of Digital Game Based Learning in a classroom environment. In addition, school administrators and curriculum developers need to be

able to provide structured professional development for educators with a focus on both technical digital literacy and ethical/responsible practices associated with digital technologies. Future research may investigate additional factors that contribute to the adoption of Digital Game Based Learning by teachers, including, but limited to, school/district level support, opportunities for training and professional development, and available classroom resources.

- School administrators may provide resources and monitor progress of Learning Action Cell programs that support a culture of continuous learning and innovation by Teachers. Curriculum developers and future researchers may also explore training models that refine digital citizenship training, game-based strategies for improved digital literacy & cyber security, to ensure they remain responsive to both teaching needs and student needs.

- Replicate the study using mixed-method research design. Triangulation of data should also be included.

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