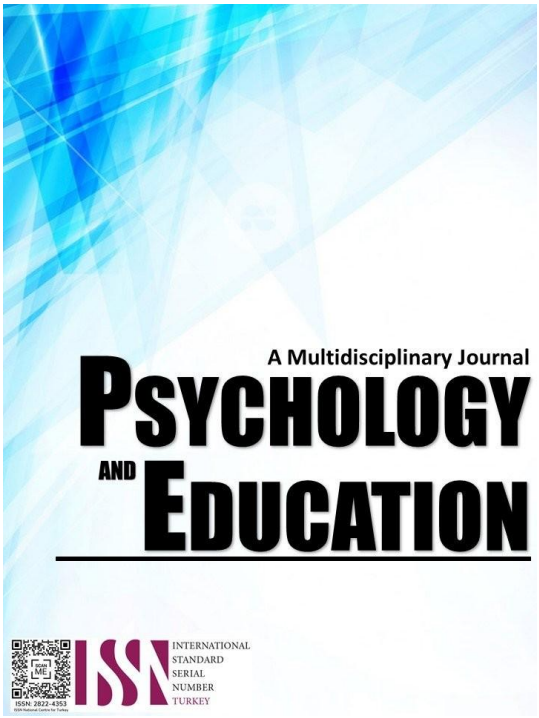
EXPLORING THE RELATIONSHIP BETWEEN TECHNOLOGICAL PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK) AND TEACHERS' PERFORMANCE IN THE CLASSROOM



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Research Article

Exploring the Relationship Between Technological Pedagogical and Content Knowledge (TPACK) and Teachers' Performance in the Classroom

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Abstract

This study explored the relationship between teachers' Technological Pedagogical and Content Knowledge (TPACK) and their classroom performance among Social Studies teachers in Impasugong I District, Bukidnon, during the 2024-2025 school year. It aimed to assess teachers' TPACK levels in relation to their subject areas and teaching practices, evaluate their classroom performance in terms of student engagement and learning facilitation, and determine the relationship between TPACK and teachers' performance, including its impact on teaching effectiveness. However, there is a limited number of local studies that specifically examine the correlation between TPACK and classroom performance among Social Studies teachers in rural districts like Impasugong I, Bukidnon. A total of 187 Social Studies teachers were selected through total sampling. The study employed a descriptive-correlational research design, using adapted questionnaires from Deflin (2020) and teachers' third-quarter classroom evaluation ratings based on the Department of Education's (DepEd) standardized criteria. Data analysis included mean, standard deviation, and Pearson product-moment correlation. The study found that teachers had a good level of Technological Pedagogical and Content Knowledge (TPACK) across all components, including technology, pedagogy, and content. This suggests that teachers were proficient in integrating these elements into their teaching practices. Teachers' overall classroom performance was rated as good, particularly in facilitating student learning and engagement. Their ability to manage the classroom and deliver lessons effectively contributed to this positive rating. However, the analysis revealed no significant relationship between teachers' TPACK and their classroom performance. This indicates that TPACK did not directly influence teaching effectiveness in the observed context. In this context, future researchers may conduct qualitative studies to gain deeper insights into how teachers apply TPACK in diverse learning environments.

Keywords: *technological pedagogical and content knowledge, teachers' performance, social studies*

Introduction

In the current educational framework of the Department of Education, particularly within the Division of Bukidnon, school leaders face a significant challenge stemming from the reluctance of teachers to embrace innovation. Many teachers still rely mostly on conventional approaches and show reluctance to use modern pedagogical tools and technologies. Many times, this opposition is exacerbated by other factors, including mental and physical health challenges, trouble adjusting to contemporary teaching strategies, and the quick speed of technological development. Furthermore, cultural variety among teachers can occasionally cause workplace conflict, therefore impeding the effective application of educational changes.

By fostering a cooperative and innovative educational environment, school officials bear a significant responsibility in handling these problems. Tasked with guiding their schools toward the achievement of educational goals, instructional leaders and organizational managers This entails using statistics to identify areas needing work and starting calculated initiatives for ongoing development. Good school leadership is intimately related to the Philippine Professional Standards for Teachers (PPST), which support the acquisition of skills of the twenty-first century. These criteria inspire teachers to show mastery of their subjects, mastery of classroom management, creative use of technology in their lessons, and efficient application of these ideas.

Including technology in classroom instruction has shown to be a very effective way to support engaging and significant learning opportunities. It helps students to solve difficult issues and improves general involvement in their studies. Developing 21st-century competencies depends critically on the efficient application of technology. Many teachers still lack a thorough awareness of the Technological Pedagogical and Content Knowledge (TPACK) framework, even if some of them try to embrace digital tools. As a roadmap for optimizing instructional efficacy, TPACK emphasizes the interactions among technology, pedagogy, and topic knowledge.

Professional development initiatives, especially those aimed at the TPACK framework, are desperately needed to close this disparity. These initiatives ought to consist of practical seminars, chances for group learning, and continuous support systems. Such instruction helps teachers to become more confident and competent in smoothly including technology in their courses. Teachers can create more dynamic, learner-centered learning environments by enhancing their capacity to match subject information with appropriate pedagogical strategies and technological tools. In the end, giving teachers TPACK-related tools improves the quality of their education and gets students ready for the expectations of society to be more and more digital.

Teachers' grasp of the TPACK framework greatly affects their classroom performance, especially about their ability to support student learning and involvement. TPACK helps teachers to deliberately mix digital tools with suitable teaching approaches and content understanding. This integration makes it possible to develop interesting courses that support active participation and meet different learning requirements. Appropriately used, TPACK enhances teaching results and encourages learners' longer memory of knowledge

and greater comprehension.

The objective of this study was to investigate how instructors' classroom performance related to Technological Pedagogical and Content Knowledge (TPACK). Examining the difficulties teachers have using technology and evaluating their degree of TPACK knowledge helps the study offer insightful analysis of areas where professional development could improve the quality of education. The results should encourage professional development in line with PPST standards, curriculum design, and teacher training.

The study aimed especially to assess public elementary school teachers in the Division of Bukidnon's TPACK skills for the school year 2024–2025. It also seeks to evaluate how TPACK affects their classroom performance and pinpoint areas that need work to improve learner involvement as well as teaching quality. By means of this study, it is expected that teachers' capacities to integrate technology, pedagogy, and content will increase, better preparing them to fulfill the changing needs of modern education.

Research Questions

This study aimed to examine the relationship between teachers' Technological Pedagogical and Content Knowledge (TPACK) and their overall performance in the classroom. The research focused on public elementary school teachers in the Impasugong I District, Division of Bukidnon, during the School Year 2024–2025.

1. What is the level of Technological Pedagogical and Content Knowledge (TPACK) of teachers?
2. What is the level of teachers' performance in the School Year 2024-2025?
3. Is there a significant relationship between teachers' TPACK and their teaching performance?

Methodology

Research Design

This study employed a descriptive-correlational research design, which enabled the researcher to examine potential relationships and make inferences about the connections between variables. This design was appropriate for assessing associations based on real-life experiences without manipulating any variables. Specifically, the study aimed to explore the relationship between teachers' integration of instructional technology and learners' academic achievement. Data were collected through a structured survey questionnaire administered to the participants. The gathered data were then subjected to quantitative analysis to describe the dependent variable and examine its correlation with the independent variables, thereby determining whether a statistically significant relationship existed.

Respondents

The participants of this study were Araling Panlipunan teachers from selected public schools within the Impasugong I District of the Division of Bukidnon. The schools involved in the research included Ilignan Elementary School, Sayawan Elementary School, Guihean Integrated School, Dumalaguing Integrated School, Kubayan Elementary School, Kibenton Integrated School, Impalutao Integrated School, Impasugong Central Elementary School, Cawayan Elementary School, and Kibuwa Elementary School.

These institutions offered a diverse academic environment, enabling a comprehensive exploration of the strategic leadership practices implemented by school heads and their influence on the teaching and learning of Araling Panlipunan. The chosen schools reflect the broader educational landscape of the Impasugong District, highlighting the community's commitment to advancing quality education throughout its jurisdiction.

The study employed total population sampling, wherein all elementary teachers handling Araling Panlipunan in the Impasugong I District, Division of Bukidnon, were included as respondents. This sampling method was selected to ensure full representation of the target population, thereby yielding comprehensive and reliable data on the strategic leadership practices of school heads and their impact on teaching and learning processes.

Instrument

This study employed two primary research instruments. The first was the Technological Pedagogical and Content Knowledge (TPACK) questionnaire developed by Delfin (2020), which assessed teachers' ability to integrate technology, pedagogy, and content knowledge in their instructional practices. The instrument, previously validated for both reliability and relevance, offered valuable insights into how teachers applied these three knowledge domains specifically in the delivery of Araling Panlipunan lessons.

The second instrument consisted of the teachers' third-quarter classroom evaluation ratings, based on the standardized criteria set by the Department of Education (DepEd). These ratings evaluated essential aspects of teaching performance, including lesson planning and delivery, classroom management, and learner engagement. When used together, these instruments provided a comprehensive perspective on both the teachers' knowledge integration and their actual performance in the classroom. Both tools were validated to ensure their effectiveness in addressing the study's research objectives.

Procedure

The researcher sought formal approval to conduct data collection from the school principals of the identified institutions, as well as

from the District Supervisor and the Schools Division Superintendent. Upon receiving the necessary clearances, the researcher personally coordinated with school administrators or principals to request permission from class advisers for the distribution of the survey instruments. The questionnaires were then directly administered to the participating teachers. After the completed questionnaires were retrieved, the data underwent statistical analysis. This process included systematic coding, recording, and organization of responses into tabular form. The data were then carefully reviewed, analyzed, and interpreted to derive relevant findings.

Data Analysis

The following statistical tools were employed to analyze the data collected in relation to the research questions stated in Chapter 1.

To address Research Problem 1, the level of Technological Pedagogical and Content Knowledge (TPACK) among teachers was measured using descriptive statistics, specifically the mean and standard deviation. The TPACK questionnaire provided data on the teachers' knowledge across various dimensions, with the mean indicating the average level of knowledge and the standard deviation reflecting the degree of variation in responses.

For Research Problem 2, the teachers' classroom performance was evaluated using the mean scores derived from their third-quarter performance ratings. These scores served as indicators of the teachers' effectiveness in delivering instruction and engaging learners. Descriptive statistics were used to interpret these performance results.

To respond to Research Problem 3, Pearson's Product-Moment Correlation Coefficient was applied to determine the significance and strength of the relationship between teachers' TPACK and their classroom performance. This inferential analysis assessed whether a meaningful association existed between the level of TPACK and teaching effectiveness.

Ethical Considerations

Prior to data collection, informed consent was secured from all participants, including teachers and school administrators, after they were thoroughly informed about the study's purpose, objectives, and overall procedures. Participation in the study was strictly voluntary, and respondents were assured of their right to withdraw at any point without any negative consequences. The confidentiality and privacy of all participants were safeguarded by ensuring that data were anonymized during analysis and securely stored throughout the research process. Efforts were made to minimize any potential risk by ensuring that participation did not disrupt the respondents' professional responsibilities or affect their well-being. Ethical clearance was obtained from the appropriate review authority, and formal permissions were granted by school administrators and district education officials. These steps ensured that the research adhered to ethical standards, protecting the rights, safety, and dignity of all individuals involved.

Results and Discussion

This chapter explores the relationship between teachers' Technological Pedagogical and Content Knowledge (TPACK) and their performance in the classroom. The focus is on public elementary teachers from the Impasugong I District, Division of Bukidnon, during the School Year 2024–2025.

The level of Technological Pedagogical and Content Knowledge (TPACK) of teachers in relation to their subject areas and teaching practices in terms of technology, pedagogy, content, technological pedagogical, pedagogical content and technological pedagogical content

Table 1. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Technology*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Know how to use different digital technologies.	2.95	0.363	Very Satisfactory
Know how to solve my own technical problems	2.98	0.399	Very Satisfactory
Can use technology tools to process data and results.	2.89	0.464	Very Satisfactory
Can use technology in the development of strategies for solving problems in real world.	2.96	0.353	Very Satisfactory
Can learn technology easily.	3.02	0.534	Very Satisfactory
Have sufficient opportunities to work with different technologies.	2.96	0.509	Very Satisfactory
Overall	2.96	0.258	Very Satisfactory

Table 1 presents the level of Technological Pedagogical and Content Knowledge (TPACK) among teachers concerning their subject areas and technological integration in instructional practices. The overall mean score of 2.96 (SD = 0.258) falls within the "very satisfactory" category, indicating that teachers generally agree with their capacity to integrate technology into classroom instruction. This suggests that teachers are effectively incorporating digital tools to enhance learner learning, while aligning with content-specific knowledge and pedagogical methods. For instance, teachers utilize interactive technologies such as science simulations, learning management systems for lesson delivery, and adaptive software for differentiated instruction.

In the context of Araling Panlipunan, teachers are observed using platforms like Google Earth to guide learners on virtual tours of

historical landmarks such as the Great Wall of China and the Egyptian pyramids, enhancing learner engagement. Tools like Timeline JS are also employed to construct interactive timelines, enabling learners to visualize the chronological sequence of historical events. Koh et al. (2020) emphasized that teachers with strong TPACK competencies are more capable of designing technology-rich lessons that foster deeper understanding, promote engagement, and enable adaptive teaching strategies, thereby enhancing learning outcomes.

The highest-rated indicator, "I can learn technology easily" (Mean = 3.02, SD = 0.534), highlights teachers' confidence in acquiring new technological skills. This self-assuredness contributes to effective use of digital tools in the classroom. Social Studies teachers, for example, are quick to adopt applications like Google Earth or digital primary source repositories, allowing them to guide learners through explorations of geopolitical changes or historical contexts. This is supported by Tondeur et al. (2021), who noted that teachers with high confidence in learning technology are more likely to implement digital tools that support critical thinking and engagement.

Conversely, the indicator "I can use technology tools to process data and results" (Mean = 2.89, SD = 0.464) received the lowest mean, though it remains within the "very satisfactory" range. This result implies a relative need for professional development in the use of data-processing tools. In Social Studies, where the analysis of demographic, economic, or historical data is vital, some teachers may face difficulty utilizing platforms such as Google Sheets or Tableau for data interpretation activities like population growth or electoral analysis. Ertmer and Ottenbreit-Leftwich (2020) emphasize that targeted training in these areas can strengthen teachers' proficiency and enrich classroom instruction.

Additional indicators, such as "I know how to solve my own technical problems" (Mean = 2.98, SD = 0.399) and "I have sufficient opportunities to work with different technologies" (Mean = 2.96, SD = 0.509), suggest that while teachers possess some ability to troubleshoot independently, technical issues still present challenges that may require additional support. Furthermore, while access to digital tools is generally adequate, limitations in training or full integration into daily instruction persist. Tondeur et al. (2021) assert that sustained professional development and consistent hands-on exposure to educational technologies are crucial for improving teachers' self-reliance in resolving technical issues and successfully embedding technology in their pedagogy.

Table 2. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Pedagogy*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Know how to adapt lessons to improve learners' learning.	3.09	0.290	Very Satisfactory
Can use a wide range of teaching approaches in a classroom setting (Collaborative learning, direct instruction, inquiry learning, problem /project-based learning, etc.).	3.05	0.286	Very Satisfactory
Know how to organize a classroom environment for learning.	3.08	0.265	Very Satisfactory
Know how to assess learner performance in a classroom.	3.07	0.250	Very Satisfactory
Can adapt my teaching style to different learners.	3.03	0.274	Very Satisfactory
Can assess learner learning in multiple ways.	3.00	0.343	Very Satisfactory
Overall	3.05	0.238	Very Satisfactory

Table 2 presents the level of Technological Pedagogical and Content Knowledge (TPACK) of teachers in relation to pedagogy within their subject areas and instructional practices. The overall mean score is 3.05 (SD = 0.238), which falls under the "very satisfactory" category. This indicates that teachers generally express strong confidence in integrating technology with pedagogical strategies to enhance learner learning. It further suggests that they are capable of designing and delivering lessons using digital tools aligned with sound instructional approaches.

In Social Studies classrooms, for example, teachers commonly utilize multimedia presentations, interactive simulations, and online collaborative platforms to encourage learners' participation in historical analysis and civic discussions. While their pedagogical application of technology is commendable, opportunities remain to further enhance this integration, such as incorporating adaptive learning technologies to address differentiated instruction. Zhao and Wang (2022) found that teachers' confidence levels are significantly associated with their actual proficiency in embedding technology into their pedagogical methods.

The highest-rated indicator is "I know how to adapt lessons to improve learners' learning" (Mean = 3.09, SD = 0.290), indicating that teachers are confident in adjusting instructional techniques to better support learner comprehension and participation. This reflects their ability to integrate diverse strategies, including digital tools, to accommodate various learning styles. In a Social Studies setting, for instance, a teacher may shift from a lecture-centered approach to a more interactive format by incorporating timelines, primary document analysis, or digital storytelling to make historical content more engaging and accessible. Supporting this, Harris and Hofer (2021) noted that teachers who skillfully adapt lessons using technology tend to foster more meaningful and learner-centered experiences, contributing to improved academic outcomes. On the other hand, the indicator "I can assess learner learning in multiple ways" (Mean = 3.00, SD = 0.343) received the lowest mean score, suggesting that while teachers do employ varied assessment methods, there is still room to diversify evaluation techniques using technological tools. Other significant indicators include "I know how to organize a classroom environment for learning" (Mean = 3.08, SD = 0.265) and "I know how to assess learner performance in a classroom" (Mean = 3.07, SD = 0.250), both of which affirm that teachers possess core skills in classroom management and learner evaluation. The use of technology in these areas enhances the overall teaching and learning experience.

For instance, in Araling Panlipunan classes, teachers may assess learner understanding through formative assessments like online quizzes, structured debates, and project-based outputs evaluating historical topics or civic duties. Organizing an effective learning environment may involve creating digital stations for group tasks or configuring the physical space to support interactive discussion formats. When evaluating performance, teachers might apply digital rubrics to assess essays or visual projects. According to Darling-Hammond et al. (2022), effective instructional strategies—including the use of diverse assessment tools and well-organized classroom settings—contribute significantly to learner engagement, comprehension, and retention. Moreover, they emphasize that fostering collaborative learning and active participation builds critical thinking and real-world problem-solving skills.

Table 3. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Content*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Have sufficient knowledge (the particular content).	2.90	0.475	Very Satisfactory
Can use (the particular content) as the way of thinking.	2.92	0.422	Very Satisfactory
Have various ways and strategies of developing my understanding of (the particular content).	2.93	0.470	Very Satisfactory
Have sufficient knowledge about structure of knowledge (the particular content).	2.96	0.438	Very Satisfactory
Know concepts, facts, theories, and procedures within the particular content.	2.83	0.496	Very Satisfactory
Believe in the validity and reliability of the (particular content)	3.02	0.389	Very Satisfactory
Overall	2.92	0.365	Very Satisfactory

Table 3 presents the level of Technological Pedagogical and Content Knowledge (TPACK) of teachers in relation to content within their subject areas and instructional practices. The overall mean score is 2.92 (SD = 0.365), which is interpreted as "very satisfactory." This indicates that teachers possess a strong grasp of subject content and can utilize technology to enhance its delivery. However, some areas still require further strengthening. In the context of Araling Panlipunan, teachers employ digital archives, virtual museum tours, and interactive maps to reinforce learners' comprehension of historical and geographical themes.

Nonetheless, certain teachers may benefit from further training to fully integrate specialized technological tools tailored for content-specific instructions such as Geographic Information Systems (GIS) for geography or data visualization platforms to teach economic trends. Supporting this observation, Lee, Chung, and Wei (2022) emphasized that teachers with well-developed content knowledge combined with technological and pedagogical expertise are better equipped to design engaging lessons that address various learning needs. This integrated approach fosters deeper understanding and promotes active learner participation.

Among the indicators, "I believe in the validity and reliability of the (particular content)" garnered the highest mean score (Mean = 3.02, SD = 0.389). This reflects teachers' confidence in the credibility and trustworthiness of the subject matter they deliver. It also implies a conscious effort to base instruction on accurate and evidence-based materials. For example, Social Studies teachers often rely on primary documents, peer-reviewed research, and official government publications to ensure the accuracy of classroom discussions. Additionally, they train learners to critically evaluate sources, promoting discernment between factual and biased information. Wineburg and McGrew (2020) argue that fostering critical source analysis skills strengthens learners' capacity to navigate digital content responsibly, especially in an era marked by widespread misinformation.

Conversely, the indicator with the lowest mean is "I know concepts, facts, theories, and procedures within the particular content" (Mean = 2.83, SD = 0.496), though it still falls within the "very satisfactory" category. Other notable indicators include "I have sufficient knowledge about the structure of knowledge (the particular content)" (Mean = 2.96, SD = 0.438) and "I have various ways and strategies of developing my understanding of (the particular content)" (Mean = 2.93, SD = 0.470). These results suggest that while teachers possess a basic understanding of their subject matter, there is a need for deeper mastery in conceptual frameworks, theoretical foundations, and strategies for further content development. In Araling Panlipunan, this may be seen in challenges explaining complex geopolitical theories or analyzing historical causation beyond basic facts.

To improve content mastery, teachers may participate in professional development programs, engage in historiographical analysis, or adopt interdisciplinary approaches that link history with other social sciences like economics or political science. Esendemir and Bindak (2019) affirmed that solid content knowledge is fundamental to effective teaching, as it allows teachers to present material with greater coherence, address misconceptions, and implement instructional strategies that meet diverse learner needs.

Table 4. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Technological Pedagogical*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Am able to identify digital technologies to enhance the teaching approaches for a lesson.	2.84	0.430	Very Satisfactory
Can implement specific digital technologies to support learners' learning for a lesson.	2.87	0.466	Very Satisfactory
Think deeply about how digital technologies influence teaching approaches I use	2.93	0.433	Very Satisfactory

in my classroom.			
Can adapt digital technologies to support learning in my classroom.	2.97	0.448	Very Satisfactory
Can use technology resources to facilitate higher order thinking skills, including problem solving, critical thinking, decision making, knowledge and creative thinking.	2.86	0.416	Very Satisfactory
Can use technology tools and information resources to increase productivity.	2.91	0.449	Very Satisfactory
Overall	2.89	0.342	Very Satisfactory

Table 4 presents the level of Technological Pedagogical and Content Knowledge (TPACK) among teachers in relation to their subject areas and teaching practices, specifically in the domain of technological pedagogy. The computed overall mean of 2.89 (SD = 0.342) is interpreted as "very satisfactory," indicating that teachers generally possess a competent ability to integrate technology into their pedagogical strategies. However, this also suggests the potential for further enhancement, particularly in optimizing the use of digital tools for instructional purposes. In Social Studies classes, for instance, teachers make use of digital storytelling, virtual field trips, and online discussion forums to foster critical thinking and enrich historical understanding. Still, some teachers may benefit from additional training to effectively select and align digital tools with specific instructional goals—such as employing data visualization software to examine historical patterns or utilizing collaborative platforms to simulate civic debates. This aligns with the findings of Lynch and Francis (2022), who emphasized that targeted professional development enhances teachers' capacity to create engaging, technology-enriched lessons that positively impact learner learning.

The indicator with the highest mean score is "I can adapt digital technologies to support learning in my classroom" (Mean = 2.97, SD = 0.448), which indicates that teachers are confident in modifying and applying various digital tools—including multimedia content, interactive applications, and web-based collaboration tools—to meet their instructional goals. In Social Studies, this may involve using digital timelines to contextualize historical events, implementing virtual reality tools for immersive exploration of historical landmarks, or hosting asynchronous discussions on political themes. Although teachers demonstrate adaptability, there remains a need for more structured training to help them fully utilize emerging technologies for differentiated and personalized instruction. This is consistent with the study of Theodorio (2023), which highlights the importance of sustained professional development and practical exposure in improving teachers' technological flexibility and effectiveness.

Conversely, the lowest mean score was recorded for the indicator "I am able to identify digital technologies to enhance the teaching approaches for a lesson" (Mean = 2.84, SD = 0.430), although it still falls under the "very satisfactory" category. Additional noteworthy indicators include "I think deeply about how digital technologies influence teaching approaches I use in my classroom" (Mean = 2.93, SD = 0.433) and "I can use technology tools and information resources to increase productivity" (Mean = 2.91, SD = 0.449). These scores imply that while teachers acknowledge the value of digital tools in enhancing instruction, there is still room for growth in identifying the most effective technologies and incorporating them systematically. Strengthening these competencies through continuous professional learning can lead to more dynamic and interactive classrooms.

To further illustrate, Social Studies teachers often use presentation tools like PowerPoint but are also beginning to explore advanced resources such as GIS mapping for geography and digital archives for historical investigation. Virtual museum tours and online simulations can be used to animate historical content and deepen learner engagement. According to Koehler and Mishra (2020), the TPACK framework underscores the necessity of integrating technological, pedagogical, and content knowledge to deliver effective instruction. Teachers who cultivate strong TPACK are better equipped to implement instructional strategies that leverage technology in ways that address diverse learner needs and academic objectives.

Table 5. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Technological Content*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Know about technologies that can use for understanding (the particular content).	2.93	0.383	Very Satisfactory
Can use technology for presenting (the particular content).	2.97	0.387	Very Satisfactory
Can find and evaluate the resources that I need for (the particular content).	2.94	0.373	Very Satisfactory
Know how to use specific software and websites for understanding (the particular content).	2.86	0.473	Very Satisfactory
Can use technology tools and resources for managing and communicating information of (the particular content).	2.88	0.441	Very Satisfactory
Use technologies as my source to develop my own knowledge of (the particular content).	2.98	0.399	Very Satisfactory
Overall	2.93	0.306	Very Satisfactory

Table 5 outlines the level of Technological Pedagogical and Content Knowledge (TPACK) of teachers in relation to their subject areas and instructional practices, particularly focusing on technological content. The overall mean score of 2.93 (SD = 0.306) falls within the "very satisfactory" range, indicating that teachers are generally proficient in integrating technology with both pedagogical methods and subject content to enhance learner engagement and learning outcomes. In Social Studies classrooms, this integration is evident through the use of digital mapping tools, virtual reality (VR) tours of historical landmarks, interactive timelines, and online forums for

collaborative discussions on historical and societal topics. For example, teachers employ digital simulations to help learners explore historical events or analyze demographic shifts through online data visualization platforms. This finding is reinforced by Kapici and Akcay (2020), who found that teachers with high levels of TPACK effectively utilize technology to foster inquiry-based learning and promote critical thinking, resulting in improved learner engagement and comprehension.

Among the indicators, the highest mean score was noted for "I use technologies as my source to develop my own knowledge of (the particular content)" (Mean = 2.98, SD = 0.399). This suggests that teachers actively rely on digital tools to broaden their content knowledge by accessing up-to-date information, research findings, and teaching methodologies. For instance, teachers preparing lessons on historical events or socio-political issues often consult digital archives, scholarly databases, and educational platforms such as YouTube or TED-Ed. This behavior aligns with the findings of Jiménez Sierra et al. (2023), who emphasized that teachers who utilize technology for professional learning are better positioned to design dynamic and content-rich lessons that stimulate learner curiosity and understanding.

Conversely, the lowest mean score was observed in the indicator "I know how to use specific software and websites for understanding (the particular content)" (Mean = 2.86, SD = 0.473), which, while still "very satisfactory," points to a relative weakness in navigating specialized educational technologies. Additional noteworthy indicators include "I can use technology for presenting (the particular content)" (Mean = 2.97, SD = 0.387) and "I can find and evaluate the resources that I need for (the particular content)" (Mean = 2.94, SD = 0.373). These results imply that although teachers are confident in presenting and evaluating content using digital tools, they may require further training in the use of content-specific software and websites for deeper understanding.

In practice, this is evident when teachers comfortably utilize basic tools such as PowerPoint for lectures but face challenges incorporating more advanced platforms, such as GIS mapping tools or online historical databases. While they are able to deliver lessons effectively, they may not fully maximize digital archives for comprehensive content analysis. According to Zhao and Wang (2022), although teachers are generally familiar with standard technologies, they often need focused professional development to improve their ability to integrate specialized digital resources within specific subject contexts. Offering workshops and peer mentoring sessions can help enhance their competency, allowing them to explore, practice, and apply subject-specific technologies in real-world classroom settings. Such targeted training not only boosts confidence but also equips teachers to deliver content more effectively and enrich learner learning experiences through the strategic use of educational technology.

Table 6. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Pedagogical Content*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Know prior knowledge of the learners about (the particular content)	3.56	3.932	Outstanding
Know how to select effective teaching approaches to guide learner thinking and in (learning a particular content).	3.22	2.757	Very Satisfactory
Know how and what to assess of the (particular content).	2.94	0.325	Very Satisfactory
Have good understanding of teaching (the particular content) so that learners are able to learn.	2.98	0.317	Very Satisfactory
Have good understanding of instructional strategies that are suitable for the topic(content).	3.03	0.316	Very Satisfactory
Am able to manage my learners' learning about the particular content)	3.03	0.316	Very Satisfactory
Overall	3.13	0.845	Very Satisfactory

Table 6 illustrates the level of Technological Pedagogical and Content Knowledge (TPACK) among teachers in terms of pedagogical content knowledge relative to their subject areas and instructional practices. The overall mean score of 3.13 (SD = 0.845) falls within the "very satisfactory" category. This implies that teachers are generally adept at applying instructional strategies aligned with both content and pedagogy, enhancing learners' learning experiences. In Social Studies, this competence is demonstrated through the use of differentiated instruction, scaffolding techniques, and inquiry-based learning, often supported by digital resources such as online research tools and multimedia materials. According to Yılmaz (2021), teachers with strong pedagogical content knowledge integrated with technology can adapt teaching strategies to better accommodate learners' needs, thereby improving academic performance and engagement.

Among the indicators, the highest mean score is recorded for "I know prior knowledge of the learners about (the particular content)" (Mean = 3.56, SD = 3.932), categorized as "outstanding." This suggests that teachers are highly aware of learners' existing knowledge before introducing new material. In practice, this is evident when Social Studies teachers use diagnostic assessments or KWL charts to assess learners' familiarity with historical or socio-political topics before instruction. Understanding prior knowledge allows teachers to build meaningful links between new content and learners' existing frameworks. Peng et al. (2021) emphasize that incorporating learners' prior knowledge into instructional design enhances the effectiveness of content delivery and promotes deeper understanding.

Conversely, the indicator "I know how and what to assess of the (particular content)" has the lowest mean at 2.94 (SD = 0.325), although it still falls within the "very satisfactory" range. This highlights a relative challenge in selecting or designing assessments that measure deeper levels of understanding. Additional indicators such as "I know how to select effective teaching approaches to guide

learner thinking and in (learning a particular content)" (Mean = 3.22, SD = 2.757) and "I have a good understanding of instructional strategies that are suitable for the topic (content)" (Mean = 3.03, SD = 0.316) suggest that while teachers demonstrate strength in instructional strategy selection, there is room for improvement in assessment literacy. In classroom settings, this often translates to a reliance on conventional assessment tools like multiple-choice tests, which may not fully capture learners' analytical capabilities.

To address this, teachers are encouraged to diversify their assessment methods by integrating essays, debates, and project-based learning activities that promote critical thinking. Xu and Brown (2021) highlight the need for continued professional development in assessment design to help teachers align evaluation strategies with learner-centered learning objectives. Enhancing this competency ensures that instructional effectiveness is not only based on delivery but also on the accurate measurement of learning outcomes.

Table 7. *Level of Technological Pedagogical and Content Knowledge (TPACK) of Teachers in Relation to their Subject Areas and Teaching Practices in terms of Technological Pedagogical Content*

Indicators	*Mean*	*SD*	*Qualitative Interpretation*
As a teacher, I…			
Can choose technologies that enhance the learning of (the particular content) for a lesson.	3.03	0.419	Very Satisfactory
Can use strategies that combine (the particular content), technologies and the teaching approaches that I learned about in my coursework in my classroom.	3	0.343	Very Satisfactory
Can select technologies to use in my classroom that enhance what I teach, how to teach and what learners learn.	2.94	0.49	Very Satisfactory
Can select digital technologies to use with specific instructional strategies as I guide learners about (the particular content).	2.93	0.452	Very Satisfactory
Can provide leadership in helping others to coordinate the use of (the particular content), technologies, and teaching approaches at my school/district.	2.87	0.501	Very Satisfactory
Can use strategies that combine (the particular content), digital technologies and teaching approaches to support learners' understandings and thinking as they are learning (the particular content).	2.85	0.442	Very Satisfactory
Overall	2.93	0.349	Very Satisfactory

Table 7 presents the level of Technological Pedagogical and Content Knowledge (TPACK) among teachers concerning their subject areas and instructional practices, specifically in the domain of technological pedagogical content. The overall mean score of 2.93 (SD = 0.349) is classified as "very satisfactory," indicating that teachers can integrate technology with appropriate pedagogical methods to enhance content delivery and facilitate learner learning. This suggests that teachers can thoughtfully select and apply digital tools that align with both instructional strategies and learning goals, making lessons more dynamic and engaging. In Social Studies classrooms, for example, teachers utilize virtual reality simulations to immerse learners in historical events, implement interactive timelines for exploring historical sequences, and use collaborative platforms like Google Classroom for discussions and group research. Some teachers also adopt flipped classroom models using pre-recorded video lessons and digital assessments to support individualized learning. These practices affirm the findings of Jacob, John, and Gwany (2020), who noted that teachers with strong technological pedagogical content knowledge can adapt digital resources to varied instructional approaches, fostering improved comprehension, participation, and critical thinking among learners.

Among the indicators, "I can choose technologies that enhance the learning of (the particular content) for a lesson" has the highest mean score (Mean = 3.03, SD = 0.419), indicating that teachers are confident in selecting appropriate technological tools that align with specific lesson objectives. In Social Studies, for instance, teachers might use interactive maps to explain geopolitical developments, incorporate digital archives to analyze primary historical documents, or employ simulations and educational games to illustrate complex political or economic systems. This aligns with Niess (2021), who emphasized that teachers with well-developed TPACK can align content, pedagogy, and technology effectively to boost learner motivation and conceptual understanding.

Conversely, the indicator "I can use strategies that combine (the particular content), digital technologies, and teaching approaches to support learners' understandings and thinking as they are learning (the particular content)" received the lowest score (Mean = 2.85, SD = 0.442), though it remains within the "very satisfactory" range. Other notable indicators include "I can select technologies to use in my classroom that enhance what I teach, how to teach, and what learners learn" (Mean = 2.94, SD = 0.490) and "I can use strategies that combine (the particular content), technologies, and the teaching approaches that I learned about in my coursework in my classroom" (Mean = 3.00, SD = 0.343), suggesting that teachers possess moderate confidence in integrating digital tools with their instructional strategies.

These findings reveal that while Social Studies teachers demonstrate competence in using technology and pedagogical approaches independently, they encounter challenges when attempting to synthesize all three TPACK components into a cohesive instructional model. For example, while many are comfortable using tools such as PowerPoint or educational videos, they may hesitate to utilize more interactive tools like GIS mapping or historical simulation software. Koehler and Mishra (2021) advocate for targeted professional development focused on instructional design within the TPACK framework to help teachers meaningfully integrate technology, pedagogy, and content. This kind of training is essential to enhance instructional practices and maximize the educational benefits of digital integration.

The Level of Teachers' Performance in the School Year 2024-2024

Table 8. *Level of Teachers' Performance in the School Year 2024-2025*

Teachers' Performance Rating Scale	*f*	*%*
81-85	33	27.50
86-90	77	64.17
91-95	9	7.50
96 -100	1	0.83
Total	120	100

Table 8 presents the classroom performance of teachers based on their third-quarter average ratings, with emphasis on learner learning and engagement. Most of the teachers, 77 or 64.17%, received scores between 86 and 90, reflecting strong instructional effectiveness. Additionally, 33 teachers, representing 27.5%, earned scores ranging from 81 to 85, which indicates very satisfactory performance but also suggests areas where improvement is possible. Meanwhile, 9 teachers (7.50%) scored within the 91–95 range, showcasing high proficiency in facilitating learner learning and classroom engagement. Only one teacher (0.83%) achieved an outstanding performance rating within the 96–100 bracket.

Overall, the data indicate that most teachers fall within the "satisfactory" to "very satisfactory" performance categories, with a significant portion clustering in the 86–90 range. This reflects a generally competent teaching workforce. However, the relatively small number of teachers who reached exceptional performance levels suggests a need for more focused and specialized professional development initiatives. These efforts may include mentorship programs, peer coaching, and workshops on innovative instructional strategies.

Darling-Hammond et al. (2020) emphasized that ongoing professional learning and support significantly enhance teaching effectiveness and learner engagement. Through well-designed training programs, teachers can be equipped with advanced pedagogical skills and innovative tools, enabling them to elevate their performance and more effectively meet diverse learner needs. As a result, increasing the number of high-performing teachers can lead to better learner outcomes and more dynamic classroom environments.

The test of significant relationship between teachers' TPACK and their performance in the classroom, and how does this relationship impact teaching effectiveness

Table 9. *Test of Significant Relationship between Teachers' TPACK and their Performance in the Classroom, and How Does this Relationship Impact Teaching Effectiveness*

Indicators	*Coefficient*	*p-value*	*Interpretation*
Technology	.056	.541	Not Significant
Pedagogy	.047	.611	Not Significant
Content	.105	.253	Not Significant
Technological Pedagogical	.164	.073	Not Significant
Pedagogical Content	.055	.552	Not Significant
Technological Pedagogical Content	-.001	.989	Not Significant
Overall	.087	.346	Not Significant

The data analysis presented in Table 9 indicates that there is no significant relationship between teachers' Technological Pedagogical and Content Knowledge (TPACK) components and their classroom performance. Specifically, the variables "Technology" (r = .056, p-value = .541), "Pedagogy" (r = .047, p-value = .611), and "Content" (r = .105, p-value = .253) show weak and statistically non-significant correlations with teacher performance. Similarly, the dimensions "Technological Pedagogical" (r = .164, p-value = .073), "Pedagogical Content" (r = .055, p-value = .552), and "Technological Pedagogical Content" (r = -.001, p-value = .989) also do not reflect significant associations.

The overall correlation result (r = .087, p-value = .346) confirms the absence of a statistically meaningful relationship, suggesting that TPACK, as measured in this study, does not directly influence classroom performance. Thus, the null hypothesis is not rejected.

These results imply that although TPACK serves as a relevant conceptual framework for integrating technology, pedagogy, and content in instructional practices, it may not be the sole determinant of teacher effectiveness. Other factors, such as years of teaching experience, mastery of instructional strategies, and the presence of institutional support, may play a more influential role in enhancing classroom outcomes. For instance, a seasoned teacher with well-developed classroom management skills and adaptive instructional techniques might perform more effectively than a teacher with strong TPACK knowledge but limited teaching experience. Likewise, the use of active learning strategies, differentiated instruction, and formative assessments often contributes significantly to learner engagement and achievement, independent of technological integration.

Additionally, the availability of institutional resources—such as access to instructional materials, mentorship programs, and continuous professional development—can substantially affect a teacher's performance. Even with a solid foundation in TPACK, the absence of adequate technological resources or administrative support can hinder the practical application of this knowledge in classroom settings. These findings are consistent with the conclusions of Koh et al. (2020), who emphasized that while TPACK is essential, its effectiveness

is maximized only when supported by proper training and favorable teaching conditions.

Conclusions

In light of the findings, the following conclusions are drawn:

Teachers possess a commendable level of Technological Pedagogical and Content Knowledge (TPACK), which affirms their readiness to integrate content, pedagogy, and technology in their teaching practices.

Their very satisfactory classroom performance reflects competence in engaging learners and delivering lessons that promote active participation and knowledge acquisition.

However, the absence of a significant relationship between TPACK and teaching performance suggests that other factors—such as professional experience, instructional techniques, or learner-related dynamics—may have a more direct impact on classroom effectiveness.

Based on the findings and conclusions, the following recommendations are offered:

Teachers may continue strengthening their TPACK competencies through sustained professional development programs, workshops, and peer learning engagements. Exploring innovative applications of TPACK in diverse classroom contexts may further enrich their instructional practices.

School administrators may consider providing more avenues for teachers to apply their TPACK skills in classroom settings, supported by access to necessary tools and guided mentorship to reinforce the connection between TPACK and instructional quality.

The Department of Education may explore the integration of more comprehensive evaluation frameworks that capture both technological and pedagogical dimensions of teaching. Policy enhancements may support balanced professional development focusing on both content mastery and technology integration.

Future researchers may investigate other contributing variables to classroom performance, including but not limited to instructional methods, teaching experiences, learner diversity, and school-based support systems. They may also conduct qualitative studies to gain deeper insights into the practical application of TPACK in real teaching environments.

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