

Pedagogical Content Knowledge and Performance of Education Unit-Earner Teachers in Public Schools

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Abstract. Education unit-earner teachers, or those licensed teachers who are non-education graduates, play an increasingly important role in the Philippine public school system, raising important considerations about how well-equipped they are with pedagogical content knowledge (PCK) to ensure quality instruction. This study was conducted primarily to determine if their level of PCK, measured in terms of content knowledge, knowledge of learners, curriculum understanding, and pedagogy, significantly influences their Teaching Performance (TP) in terms of learning environment and learner diversity, curriculum planning, assessment and reporting, community linkages, and teacher professionalism. Using a descriptive-regression analysis design, 100 licensed secondary teachers in Davao Occidental DepEd Division were surveyed. Findings revealed that the respondents exhibited excellent PCK ($\bar{x}=4.24$), as well as excellent TP ($\bar{x}=4.24$). Regression analysis showed that PCK is a statistically significant and positive predictor of TP among Education unit-earner teachers. The regression model indicates that for every one-unit increase in PCK, teaching performance increases by 0.362 units. The model demonstrated a high level of statistical significance ($p < .001$) and an R^2 value of 0.471, meaning that PCK explains about 47.1% of the differences in teaching performance among the respondents. The remaining 52.9% is likely influenced by other factors not included in the model. The study recommends enhancing the curriculum and practicum of certification programs for Education unit-earners, strengthening licensure policies to include pedagogical training and mentoring, as well as institutionalizing targeted professional development in schools. The study recommends enhancing certification programs for education unit-earners through improved pedagogical training, practicum, and mentoring. Curricula should emphasize inclusive, differentiated, and reflective teaching. Licensure policies must uphold pedagogical rigor, and schools should institutionalize peer coaching and collaborative planning. Finally, future research should examine the long-term development of PCK and investigate other factors that could also influence TP.

Keywords: Education unit-earners; Pedagogical content knowledge; Philippines; Quantitative research; Teaching performance.

1.0 Introduction

Effective teaching requires more than just subject matter expertise. It involves the ability to transform content into meaningful learning experiences that are responsive to students' needs, prior knowledge, and misconceptions. This principle is central to Shulman's (1986) framework of Pedagogical Content Knowledge (PCK), which

emphasizes the integration of content knowledge and pedagogy to support effective teaching and learning. According to Shulman, teaching extends beyond the transmission of information; it requires reshaping subject matter into forms that are accessible and engaging for diverse learners. PCK serves as a bridge between content expertise and the capacity to teach it effectively, influencing essential aspects of teaching performance such as lesson planning, assessment, and student engagement.

Recent studies affirm the practical importance of PCK in the classroom. Shogbesan and Ahmed (2023) noted that PCK enables teachers to design instructional strategies that address learners' preconceptions and varied learning needs. Fukaya et al. (2025) further found that teachers with strong PCK are more capable of delivering instruction that leads to improved student outcomes. While PCK is a core component of full teacher education programs, the growing number of education unit-earning teachers – those licensed teachers who have completed the required professional education units but did not major in teacher education – raises important concerns. For these individuals, developing PCK is especially critical, as it helps close the gap between content mastery and instructional competence. Given their limited formal training in pedagogy, it is necessary to assess whether Education unit-earners have acquired sufficient PCK to meet professional teaching standards and deliver quality instruction.

Globally, the significance of PCK in improving teaching performance has been widely documented. In Germany, Neumann et al. (2019) found that PCK has a strong influence on instructional readiness, particularly in planning and assessment. Similarly, Nind (2020) in the United Kingdom found that PCK enhances teachers' ability to simplify complex concepts and adapt strategies to learner needs. Conversely, Goos et al. (2020) observed that teachers without formal pedagogical training tend to over-rely on traditional instructional methods, which limits student engagement and critical thinking. These findings underscore the importance of continuous professional knowledge development, as echoed by Akkaya (2021), who advocated for targeted pedagogical training to enhance instructional quality.

In the Asian context, several studies have explored how PCK contributes to overall teaching performance among formally trained educators. Lee Shing et al. (2015) emphasized that PCK enhances teaching quality and instructional planning, which are crucial aspects of classroom performance. In Taiwan, Tseng et al. (2022) reported that teachers demonstrated varying levels of confidence in their ability to apply PCK, indicating differences in their preparedness to teach effectively. Similarly, Akram et al. (2021) in China highlighted that PCK enables teachers to integrate subject knowledge with effective pedagogical methods, resulting in more meaningful and engaging learning experiences. While these studies affirm the significance of PCK in improving teaching outcomes, limited research has been conducted on how it is acquired and applied by Education unit-earner teachers or non-education graduates, who often enter the profession with minimal formal pedagogical training.

In the Philippines, the Professional Regulation Commission (2022) mandates that non-education graduates complete 18 units of professional education to qualify for the licensure examination, as stipulated in the Philippine Teachers Professionalization Act of 1994. These individuals, commonly referred to as Education unit-earners, form a growing segment of the national teaching workforce. Although they possess subject expertise, studies suggest they often encounter pedagogical challenges. Arayan and Abapo (2024) found that Education unit-earners demonstrate strengths in adaptive and student-centered strategies but face difficulties with content mastery, classroom management, and instructional planning. Similar findings have emerged from Sultan Kudarat (Vicente & Salendab, 2022), Davao del Norte (Guadalquiver & Tagadiad, 2023), and higher education institutions (Somosot & Relox, 2023), where Education unit-earners reported gaps in applying content-specific pedagogy, addressing diverse learners, and connecting theoretical knowledge to classroom realities. These challenges are compounded by performance stress and limited access to instructional resources (Manigbas et al., 2024; Aheisibwe & Barigye, 2023). These studies underscore the importance of evaluating their level of pedagogical content knowledge and teaching performance, as they continue to play an increasingly vital role in the Philippine education system.

In the Department of Education's Davao Occidental Division, secondary-level teachers who are Education unit-earner teachers also mirror the findings of other studies on PCK and teaching performance. In several instances of personal communication with some of them, they shared that they often struggle with simplifying subject content, addressing diverse learner needs, aligning lessons with the curriculum, and selecting effective teaching strategies. They also mentioned challenges in managing classroom behavior, engaging in professional development, and balancing instructional duties with administrative responsibilities.

Recognizing the persistent challenges faced by Education unit-earner teachers regarding their Pedagogical Content Knowledge (PCK) and Teaching Performance, and considering that these variables remain underexplored among this group of public school teachers, particularly within Davao Occidental, knowledge and population gaps exist that warrant further investigation. In light of this, the study was conducted to determine if the PCK of Education unit-earner teachers in the Division of Davao Occidental significantly influences their TP. This study would hold significant value for various stakeholders in the educational sector, particularly those involved with the professional development and teaching performance of Education unit earner teachers. The findings would serve as a guide for enhancing teaching practices, promoting effective educational strategies, and informing policy decisions, especially within the Division of Davao Occidental.

2.0 Methodology

2.1 Research Design

This study employed a descriptive and regression design. This study was descriptive as it described the levels of PCK and teaching performance. It is a regression analysis, as it determines whether PCK has a significant influence on TP.

2.2 Respondents and Sampling Technique

The respondents in this study were professional public secondary school teachers who had acquired their eligibility as Education unit earners. Additionally, they were teaching in the Schools Division of Davao Occidental. Also, they held permanent teaching positions and had at least five years of teaching experience. This study involved 100 respondents. They were selected using purposive and convenience sampling techniques from across the five municipalities of Davao Occidental. Purposive sampling was applied to ensure that only those who met the specific criteria for inclusion (Palinkas et al., 2015). In this study, the researcher ensured that the sample was composed of individuals who met the study's specific criteria. Additionally, Convenience sampling was used because it involved selecting participants who were most easily accessible or available (Etikan et al., 2016). Despite using convenience sampling, the sample size of 100 was acceptable under the Central Limit Theorem, which holds that samples of $n \geq 30$ yield approximately normal distributions, enabling valid statistical analysis (Gravetter & Wallnau, 2017).

2.3 Research Instrument

This study utilized a researcher-made questionnaire to measure PCK. The context of the PCK was adapted from the indicators reported by Halim et al. (2012). In this study, it was contextualized to fit the teachers as respondents. It consisted of four indicators, namely knowledge of content, knowledge of learners, knowledge of curriculum, and knowledge of pedagogy. Regarding the teaching performance, the study utilized the Results-Based Performance Management System (RPMS), which is the standard tool for teacher performance as mandated by the Department of Education. It consisted of four indicators, namely the Learning Environment and Diversity of Learners, Curriculum and Planning, Assessment and Reporting, Community Linkages and Professional Engagement, Personal Growth and Professional Development, and Teachers' Professionalism. The instrument underwent content validation and pilot testing. The data gathered were processed and tested using Cronbach's Alpha, and the results showed that all values were above 0.70, indicating that all items tested passed the reliability and internal consistency test (Cortina, 1993).

2.4 Data Gathering Procedure

To ensure a well-organized data collection process and achieve the study's purpose, the following steps were taken: Initially, a letter of approval from the Dean of the Graduate School was obtained to conduct the study. Secondly, the questionnaire on PCK underwent content validation. An ethical clearance was also secured from an accredited research ethics committee. Subsequently, approvals were also secured from the Superintendent of the School Division of Davao Occidental, the Public School District Supervisor of Davao Occidental, and the School Heads of the secondary schools in Davao Occidental. Pilot testing of the survey on PCK was administered to 30 respondents. After confirming the instrument's reliability, the survey was administered to 100 respondents in a face-to-face mode, each of whom signed an informed consent form prior to participation. Respondents were given 5–10 minutes to complete the questionnaire. Each respondent voluntarily provided teaching performance data, in the form of RPMS results. Data were tabulated, processed, statistically analyzed, and interpreted. Finally, the study's findings were shared with respondents via email for verification and information purposes.

2.5 Data Analysis

In analyzing the data, mean and simple linear regression were employed. The mean was utilized to quantify the levels of pedagogical content knowledge (PCK) and teaching performance among education unit learners. According to Hurley and Tenny (2022), the mean represents the arithmetic average, calculated by dividing the total sum of values by the number of observations. Furthermore, simple linear regression was employed to determine the extent to which PCK predicts teaching performance. Montgomery et al. (2021) describe that this tool predicts the value of the dependent variable based on the value of the independent variable.

2.6 Ethical Considerations

This study placed significant importance on ethical considerations to protect the rights of respondents. Anonymity was maintained to ensure that the respondents' identities were not revealed at any point in the study. Moreover, confidentiality was observed by ensuring that the information provided by the respondents was kept in a secure place and only the researchers had access. Finally, informed consent was ensured by reading and ensuring that each respondent understood the consent form before they began completing the survey instruments and providing their teaching performance assessment. Most importantly, an Ethics Clearance for the study was acquired from an accredited Research Ethics Committee to ensure that all protocols regarding the safety of the respondents were considered and followed.

3.0 Results and Discussion

3.1 Level of Pedagogical Content Knowledge (PCK) among Education Unit-Earners

One of the primary objectives of this study was to assess the level of PCK among education unit learners. The results are presented in Table 1 below.

Table 1. *Level of Pedagogical Content Knowledge (PCK) among Education Unit-Earners*

Indicator	Mean Score	Interpretation
Knowledge of learning content	4.39	The respondents possess excellent knowledge of learning content, as evidenced by their ability to present facts, explain key concepts, simplify complex ideas, and apply updated knowledge.
Knowledge of learners	4.27	The teachers possess excellent knowledge of learners, effectively addressing their learning needs, accommodating diverse learning styles, and utilizing assessments and feedback to support individual progress.
Knowledge of curriculum	4.21	The teachers possess excellent knowledge of the curriculum, including understanding learning objectives, aligning instruction, adapting to diverse learners, staying updated on revisions, and evaluating their effectiveness in promoting student learning.
Knowledge of pedagogy	4.08	The teachers demonstrate an excellent understanding of pedagogy in terms of promoting student-centered learning, enhancing assessments, fostering critical thinking, creating positive classroom environments, encouraging collaboration, and reflecting on their teaching.
Overall	4.24	The teachers exhibit excellent pedagogical content knowledge (PCK) in terms of knowledge of learning content, learners, curriculum, and pedagogy.

The results reveal that Education unit-earners possess a high level of Pedagogical Content Knowledge (PCK), with the strongest domain being knowledge of learning content. This suggests that respondents are capable of clearly presenting facts, simplifying complex concepts, and applying updated content knowledge in their teaching practice. The strength in this domain supports the assertion of Diehm and Hendrick (2021), who emphasized that access to instructional resources and content-specific training significantly enhances subject matter mastery, particularly among pre-service and early-career teachers.

The domains of knowledge of learners and curriculum also received high ratings, suggesting that the respondents are attentive to student diversity and able to align instruction with curricular goals. However, knowledge of pedagogy, while still rated as "very good," scored comparatively lower. This implies a potential area for growth, particularly in fostering student-centered learning, promoting critical thinking, and engaging in reflective practice. Such a finding suggests that, while content mastery is strong, pedagogical flexibility and innovation may require reinforcement.

Interestingly, this generally high assessment of PCK contrasts with the findings of Guadalquiver and Tagadiad (2023), who reported that many education unit-earners struggle with subject-specific pedagogy and the application of theoretical knowledge in real classroom settings. Similarly, Irene (2023) emphasized that the

absence of formal pedagogical training may limit teaching effectiveness, especially in dynamic or inclusive classroom settings. These differing outcomes may reflect contextual variables such as access to mentoring, length of teaching experience, or the quality of institutional support. It is possible that the respondents in the present study benefited from more structured professional development, exposure to real classroom teaching, or support mechanisms that contributed to higher levels of self-reported competence. Thus, it underscores the importance of contextualizing teacher development.

3.2 Level of Teaching Performance among Education Unit-Earners

Another research problem that this study aimed to address was to determine the level of Teaching Performance among education unit earners. Results are shown in Table 2.

Table 2. *Level of Teaching Performance among Education Unit-Earners*

Indicator	Mean Score	Interpretation
Learning Environment and Diversity of Learners	4.23	Teachers demonstrate excellent performance in a learning environment that values diversity of learners, characterized by effective communication, supportive classroom practices, and strategies that promote learner autonomy and responsibility.
Curriculum, Planning, Assessment, and Reporting	4.23	Teachers demonstrate excellent performance in curriculum development, planning, assessment, and reporting, particularly in terms of utilizing learner-centered strategies, responding to the diverse needs of learners, and adapting learning programs to ensure relevance and inclusivity.
Community Linkages, Professional Engagement, Personal Growth, and Professional Development	4.25	Teachers demonstrate excellent performance in community linkages, professional engagement, and personal growth and professional development, as evidenced by their ability to maintain responsive learning environments, regularly reflect on their teaching practice, and fully comply with school policies.
Teacher Professionalism	4.24	Teachers demonstrate excellent performance in terms of professionalism, adopting practices that uphold the dignity of the teaching profession, exhibiting a caring attitude, respect, and integrity, and performing various related works and activities that contribute to the teaching-learning process.
Overall	4.24	Teachers who are Education unit-earners demonstrate excellent performance in terms of the learning environment, diversity of learners, curriculum and planning, assessment and reporting, community linkages, professional engagement, personal growth, and professional development, as well as teachers' professionalism.

The results indicate that Education unit-earners consistently exhibit an excellent level of teaching performance across all evaluated domains. The minimal variation in mean scores suggests balanced competencies, which may reflect strong initial teacher training or contextual supports provided in their respective schools. The highest rating was observed in the domains of community linkages, professional engagement, and personal growth, implying that respondents are proactive in engaging with stakeholders, reflecting on their practice, and meeting institutional expectations.

These findings are supported by Guo et al. (2024), who reported that non-education graduates exhibit teaching performance comparable to that of their Education graduate counterparts. Similarly, Mordeno (2022) also reported that teachers with education units can perform at par with those from traditional teacher education programs, particularly when given access to ongoing mentoring and resources. Further, Taryana et al. (2023) emphasized the potential of alternative certification programs to produce competent and committed educators, challenging the assumption that traditional licensure is the sole pathway to teacher quality. Moreover, the respondents' ratings also correspond with DepEd's expectations under the Philippine Professional Standards for Teachers (PPST), where domain-level competencies, such as pedagogy, assessment, and professionalism, are evaluated as indicators of teacher quality (Department of Education, 2017).

However, this study's results diverge from Goos et al. (2020), who found that education unit-earners often relied heavily on teacher-centered strategies and struggled to implement student-driven, inquiry-based approaches. This contrast may be due to contextual factors, such as differences in institutional mentoring programs, support systems, or the needs of the student population. For example, the participants in the current study may have had

access to in-service training aligned with DepEd’s RPMS tools, which promote learner-centered instruction and continuous professional growth.

A limitation of this study is its reliance on self-reported data, which may be subject to bias. Future research should consider triangulating self-assessments with classroom observations and student feedback to develop a more comprehensive understanding of actual teaching performance. Furthermore, while the findings show that Education unit-earners can perform effectively, there remains a critical need to strengthen their pedagogical depth, particularly in implementing constructivist, inclusive, and reflective teaching strategies.

3.3 Influence of Pedagogical Content Knowledge towards Teaching Performance of Education Unit-Earners

The primary objective of this study was to investigate whether pedagogical content knowledge has a significant impact on the teaching performance of Education unit earners. Results are shown in Table 3.

Table 3. *Influence of Pedagogical Content Knowledge towards Teaching Performance of Education Unit-Earners*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
(Constant)	2.707	.163		16.583	.000
Pedagogical Content Knowledge	.362	.038	.690	9.445	.000

R Adjusted = .471; *F Value* = 89.215; *Sig Value* = .000; *df* = 99

The results of the simple linear regression analysis revealed that Pedagogical Content Knowledge (PCK) is a statistically significant predictor of Teaching Performance (TP) among education unit-earners. The model yielded a highly significant p-value ($p < 0.001$), indicating that the regression model fits the data well. The derived equation – $TP = 2.707 + 0.362(PCK)$ – suggests that for every one-unit increase in teachers' PCK, their teaching performance increases by 0.362 units. The positive coefficient reflects a direct relationship between PCK and TP. The high t-value (16.583) and the R^2 value of 0.471 indicate that PCK accounts for approximately 47.1% of the variance in teaching performance. In comparison, the remaining 52.9% suggests that other influential variables remain unaccounted for.

These findings are consistent with those of Reynolds and Park (2021), who observed that teachers with higher levels of PCK were more adept at presenting content clearly and engaging students in meaningful ways. Similarly, Kim and Ko (2020) emphasized the contribution of PCK to instructional effectiveness, and a meta-analysis by Fukaya et al. (2024) further confirmed that PCK has a positive correlation with instructional quality – an essential dimension of teaching performance. Together, these studies support the conclusion that PCK has a significant impact on teacher effectiveness. The findings also provide empirical support for the seminal Pedagogical Content Knowledge framework of Shulman (1987), which posits that effective teaching requires not only mastery of subject matter but also the pedagogical ability to convey that knowledge to diverse learners. Education unit-earners in this study demonstrated high levels of PCK across key domains – content knowledge, understanding of learners, curriculum alignment, and pedagogical strategies. This reflects Shulman’s assertion that PCK is central to transforming disciplinary knowledge into content that students can understand.

Additionally, the results align with Magnusson et al.’s (1999) elaboration of Shulman’s work. Their model emphasized that PCK includes knowledge of instructional strategies, student misconceptions, and assessment methods, all of which are critical to instructional effectiveness. The strong statistical relationship between PCK and teaching performance in this study highlights how teachers effectively integrate these components to support diverse learners. Despite the strong performance observed, the results also point to areas for professional growth, particularly in the pedagogical domain, where flexibility, reflective practice, and differentiated instruction may still be underdeveloped. This supports Shulman’s view that PCK is not a static body of knowledge but one that evolves through sustained teaching practice, reflection, and continuous professional learning.

4.0 Conclusion

This study provides empirical evidence that Education unit-earner teachers possess a strong foundation in pedagogical content knowledge (PCK), particularly in content mastery. This suggests that they are well-equipped to deliver subject matter clearly and accurately in classroom settings. However, their relatively lower rating in knowledge of pedagogy highlights an area that requires further development, particularly in the application of student-centered instructional strategies and adaptive teaching practices. In terms of teaching performance, the

respondents demonstrated excellent competence across key domains, including learning environment, curriculum planning, community linkages, and professional behavior. This reflects their capacity to manage classrooms effectively, deliver relevant instruction, and uphold professional standards. Furthermore, PCK emerged as a significant predictor of teaching performance, reinforcing its central role in effective instruction. This finding supports the view that firm foundations in both content and pedagogy are essential in promoting teaching competence. However, while PCK accounted for a substantial portion of the variability in teaching performance, the presence of unexplained factors needs to be investigated.

Based on the study's conclusions, several key recommendations are proposed. First, the national teacher training policies and alternative certification pathways for education unit-earners should be strengthened through structured pedagogical training, enhanced practicum experiences, and sustained mentoring. Next, Teacher education institutions offering certification to education unit-earners should revise their curriculum to provide balanced and practice-based training in both content and pedagogy. This includes integrating modules on inclusive education, differentiated instruction, formative assessment, and reflective teaching, along with enhanced practicum experiences that offer authentic classroom application. Moreover, Policy-makers and accrediting bodies are likewise encouraged to re-examine licensure requirements for non-traditional pathways by mandating structured pedagogical coursework and sustained mentoring to ensure that unit-earners enter the profession with both theoretical grounding and practical readiness. Additionally, Division offices and school administrators should institutionalize ongoing professional development programs focused on instructional design for diverse learners, collaborative lesson planning, and peer coaching. Strengthening school-based Learning Action Cells (LACs) and coaching systems will also help translate lesson planning into more dynamic and inclusive classroom practices. Finally, future research should explore the longitudinal development of Pedagogical Content Knowledge (PCK), conduct comparative studies between licensed education graduates and unit-earners, and examine the influence of factors such as teaching experience, access to mentoring, classroom management, and institutional support on teaching performance.

5.0 Contributions of Authors

Author 1: Conceptualization, data gathering, data analysis

Author 2: Conceptualization, literature review, discussion of results

6.0 Funding

This is a non-funded study.

7.0 Conflict of Interests

There is no conflict of interest.

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