

THEORETICAL PREPARATION AND CLINICAL INTERNSHIP PERFORMANCE OF PRE-SERVICE ELEMENTARY MATHEMATICS TEACHERS: BASIS FOR PROGRAM ENHANCEMENT

RONIE L. MATAQUEL¹, & JUSTEENA C. MATAQUEL²

Philippine Christian University

mataquelr@gmail.com¹, eladen0405@gmail.com²

Abstract

The implementation of the teacher education curriculum in the Philippines requires teacher training institutions to prepare globally competitive educators grounded in national values and equipped with strong pedagogical knowledge and skills. Central to this mandate is the integration of theoretical preparation and clinical internship to strengthen pre-service teacher development. This study examined the relationship between theoretical preparation and clinical internship performance of pre-service elementary Mathematics teachers as a basis for program enhancement. Employing a descriptive–correlational research design, the study involved 96 pre-service teachers majoring in Elementary Mathematics from selected teacher education institutions in the National Capital Region. Data on theoretical preparation were obtained from a pre-board examination consisting of 200 items in General Education, 150 items in Professional Education, and 100 items in the Field of Specialization. Clinical internship performance was measured using supervisors' ratings collected via a structured questionnaire. Data were analyzed using frequency counts, percentages, means, weighted means, Pearson's product–moment correlation coefficient, and Garret's forecasting efficiency formula. Results indicated that respondents' theoretical preparation across General Education, Professional Education, and Field of Specialization generally required improvement, while clinical internship performance was rated at an average level. Correlation analysis revealed moderately small but positive relationships between theoretical preparation and clinical internship performance, with Professional Education and Field of Specialization showing stronger associations than General Education. The forecasting efficiency analysis showed that theoretical preparation accounted for only a modest proportion of clinical internship success. The findings affirm that theoretical preparation contributes to clinical teaching performance and must be strengthened and systematically aligned with practicum experiences. The study provides an empirical basis for enhancing teacher education programs through improved curricular coherence, pedagogical integration, and strengthened clinical mentoring in the preparation of elementary Mathematics teachers in the Philippines.

Keywords: teacher education, theoretical preparation, clinical internship, pre-service teachers, descriptive–correlational study, Philippines

INTRODUCTION

Teacher education is widely recognized as a critical pillar of national development, as teachers play a central role in shaping learners' knowledge, skills, values, and dispositions necessary for personal growth and societal progress. The quality of a country's educational system is closely linked to the quality of its teachers, making adequate pre-service teacher preparation a continuing priority for academic institutions and policymakers. In the Philippines, teacher training institutions are mandated to implement a teacher education curriculum that prepares globally competitive educators who are grounded in national ideals, responsive to local contexts, and equipped with strong pedagogical knowledge and professional skills (Commission on Higher Education [CHED], 1999).

A defining feature of contemporary teacher education reforms is the deliberate integration of theoretical preparation and clinical internship. Theoretical preparation provides pre-service teachers with foundational knowledge in subject matter, pedagogy, assessment, and educational theory. At the same time, clinical internship serves as the culminating experience in which these concepts are applied in authentic classroom settings. The assumption underlying this structure is that firm theoretical grounding enhances teaching performance during practicum and facilitates a smoother transition from pre-service preparation to in-service teaching. However, the extent to which theoretical preparation actually translates into effective clinical teaching remains a continuing concern in teacher education research.

Teaching is more than the mastery of content and methods; it is a complex professional practice that requires informed decision-making, classroom management, assessment literacy, and responsiveness to diverse learners. Darling-Hammond (2006) emphasizes that effective teachers draw upon a deep and integrated knowledge base that combines content expertise, pedagogical skill, and understanding of learners. Similarly, Shulman's (1987) concept of pedagogical content knowledge highlights the importance of linking subject matter knowledge with appropriate instructional strategies. These perspectives underscore the view that theoretical preparation is not an abstract requirement, but a practical foundation for effective teaching.

In the Philippine context, elementary teachers are expected to teach across multiple subject areas, making balanced preparation in General Education, Professional Education, and the Field of Specialization particularly important. Yet, anecdotal evidence and prior local studies suggest that pre-service teachers often enter clinical internship with uneven levels of theoretical competence, particularly in areas outside their specialization. This imbalance may limit their ability to integrate content, apply appropriate teaching strategies, and respond effectively to classroom challenges during practicum.

While several international studies have examined the relationship between coursework and teaching performance, there remains a need for empirical evidence drawn from local contexts, particularly in the preparation of elementary Mathematics teachers. Understanding how theoretical

preparation relates to clinical internship performance can inform curriculum refinement, instructional planning, and policy development in teacher education institutions.

In response to this need, the present study examined the relationship between theoretical preparation and clinical internship performance of pre-service elementary Mathematics teachers. By analyzing performance across General Education, Professional Education, and Field of Specialization and relating these to clinical internship outcomes, the study aimed to provide an empirical basis for program enhancement in pre-service teacher education. Specifically, it sought to clarify the extent to which theoretical preparation contributes to clinical teaching performance and to identify areas where teacher education programs can be strengthened to better prepare future elementary Mathematics teachers for the demands of classroom practice.

REVIEW OF RELATED LITERATURE

Teacher education literature consistently emphasizes the integration of theoretical preparation and clinical practice as a fundamental element of effective pre-service teacher development. Teacher quality is closely associated with content knowledge, pedagogical competence, and the ability to apply theory in authentic classroom contexts (Darling-Hammond, 2006b). Consequently, contemporary teacher education programs increasingly aim to strengthen both academic coursework and practicum experiences to better prepare future teachers for the complexities of classroom instruction.

Theoretical Preparation in Teacher Education

Theoretical preparation in teacher education generally consists of General Education, Professional Education, and Field of Specialization courses. General Education provides interdisciplinary foundations that support literacy, numeracy, and socio-cultural understanding—essential competencies for elementary teachers (Commission on Higher Education [CHED], 1999). Studies indicate that limited preparation in general education subjects can restrict teachers' capacity to integrate content across disciplines and address diverse learner needs (Ellis et al., 2020).

Professional Education courses focus on pedagogical theories, assessment practices, classroom management, and educational foundations. Shulman's (1987) concept of pedagogical content knowledge (PCK) highlights that effective teaching requires not only subject-matter expertise but also the ability to transform content into meaningful and accessible learning experiences. Empirical research supports this view, showing that teachers with strong pedagogical knowledge demonstrate higher instructional quality and more effective classroom management (König et al., 2020).

In the Field of Specialization, particularly in Mathematics, subject-specific content knowledge plays a critical role in instructional effectiveness. Ball et al. (2008) argue that mathematical knowledge for teaching differs from general mathematical proficiency, as it includes understanding student thinking and anticipating misconceptions. Research further indicates that strong subject-specific preparation enables teachers to implement effective instructional strategies and promote conceptual understanding (National Council of Teachers of Mathematics [NCTM], 2014; Santagata et al., 2021).

Clinical Internship and Teaching Performance

The clinical internship serves as the culminating phase of pre-service teacher education, allowing prospective teachers to apply theoretical knowledge in real classroom settings. Experiential learning theory explains that professional competence develops through cycles of experience, reflection, and application (Kolb, 1984). Well-structured internship programs have been shown to enhance instructional skills, professional confidence, and teaching competence (Pelletier, 2002; Paulsen, 1997).

However, research also indicates that the effectiveness of clinical internships depends on the quality of prior theoretical preparation and the level of mentoring support. Weak alignment between coursework and practicum experiences can hinder the transfer of theory into practice (Leon, 1997; Romero, 1982). International studies further suggest that while theoretical preparation positively influences teaching performance, clinical success is also shaped by contextual factors such as school environment and supervisory guidance (Koo et al., 2025).

Synthesis and Research Gap

The reviewed literature affirms that theoretical preparation and clinical internship are interdependent components of effective teacher education. Strong academic and pedagogical foundations enhance teaching performance, while authentic clinical experiences refine professional competence. Despite this, empirical studies examining the associational influence of theoretical preparation on clinical internship performance—particularly among pre-service elementary Mathematics teachers in the Philippine context—remain limited. This gap underscores the need for the present study, which aims to provide local evidence to inform curriculum enhancement and strengthen the alignment between theory and practice in teacher education programs.

THEORETICAL FRAMEWORK

This study is anchored on the theory–practice integration framework in teacher education, supported by experiential learning theory (Kolb, 1984) and competency-based teacher education (Darling-Hammond, 2006). These perspectives emphasize that teaching competence develops through the meaningful integration of theoretical knowledge and practical experience. Shulman’s pedagogical content knowledge (PCK) framework (1987) further reinforces the importance of integrating subject-matter expertise with effective pedagogical strategies.

The conceptual framework views pre-service teacher education as an overarching system composed of two interrelated components: theoretical preparation and clinical internship. Theoretical preparation includes General Education, Professional Education, and the Field of Specialization (Elementary Mathematics), which collectively provide the academic, pedagogical, and content foundations necessary for effective teaching.

A directional, non-causal relationship, described as an associational influence, indicates that the level of theoretical preparation attained by pre-service teachers is related to their performance during the

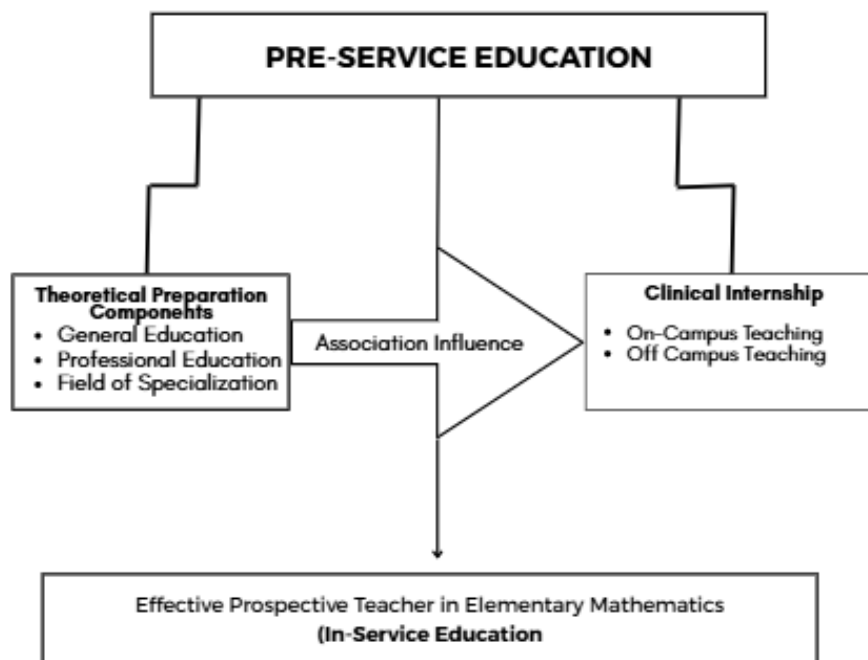
clinical internship. This relationship suggests that stronger theoretical grounding is associated with more effective classroom practice, while recognizing the influence of contextual and experiential factors.

The clinical internship, encompassing both on-campus and off-campus teaching experiences, enables pre-service teachers to apply theoretical knowledge in authentic instructional settings. Through these experiences, they refine instructional strategies, classroom management skills, and professional dispositions essential for effective teaching.

Together, theoretical preparation and clinical internship contribute to the development of competent and reflective prospective elementary Mathematics teachers prepared for in-service teaching roles. This framework provides a foundation for examining the relationship between theoretical preparation and clinical internship performance and for guiding improvements in teacher education programs.

Figure 1

A Paradigm Showing the Associational Influence of Students' Theoretical Preparation on Clinical Internship Performance



METHODOLOGY

Research Design

This study employed a descriptive–correlational research design (Creswell & Creswell, 2018) to examine the relationship between theoretical preparation and clinical internship performance among pre-service elementary Mathematics teachers. The design was appropriate as it allowed for the analysis

of naturally occurring variables without manipulation, providing both a descriptive account of participants' academic preparation and an assessment of the degree to which theoretical knowledge is associated with internship performance.

Participants and Locale

The study respondents consisted of 96 pre-service elementary Mathematics teachers who completed the Bachelor of Elementary Education (BEED) program with a specialization in Mathematics from selected teacher education institutions in the National Capital Region (NCR). Data collection was conducted during the 2004–2005 school year, specifically from May to August 2005, through three established review centers in Manila. These included the National Teachers College (32 respondents), the University of Makati (34 respondents), and Far Eastern University (30 respondents). The review sessions and assessment activities were facilitated by a team of reviewers from the National Teachers College, ensuring consistency in test administration and evaluation procedures.

Research Instruments

Data were gathered using three primary instruments designed to capture both theoretical preparation and clinical internship performance:

1. Pre-Board Examination (Documentary Analysis).

The pre-board examination served as the principal measure of respondents' theoretical preparation. It comprised 200 items in General Education, 150 items in Professional Education, and 100 items in the Field of Specialization (Elementary Mathematics). Results from both the pre-assessment and post-assessment examinations were officially documented and retrieved from the Office of the Graduate Division of the National Teachers College.

2. Clinical Internship Questionnaire.

Clinical internship performance was assessed using a structured questionnaire incorporated into the pre-board examination process. The instrument captured supervisors' ratings of respondents' teaching competence, instructional skills, classroom management, and professional behavior demonstrated during their clinical internship.

3. Casual Interview.

Informal interviews were conducted with selected respondents after the questionnaire was administered and the pre-board examination completed. These interviews supplemented quantitative data by providing contextual insights into participants' internship experiences and perceptions of their theoretical preparation.

Data Gathering Procedure

Prior to data collection, the necessary approvals were secured from the concerned institutional authorities. Documentary records of pre-board examination results and clinical internship ratings were obtained from authorized offices. The clinical internship questionnaire was administered before the

pre-board examination, while casual interviews were conducted afterward to enrich and validate the data received from the primary instruments.

Treatment of Data

To ensure systematic and reliable data analysis, the following statistical tools were utilized:

- 1) Frequency counts and percentages to describe the distribution of respondents' examination scores and clinical ratings;
- 2) Mean and weighted mean to determine the levels of theoretical preparation and clinical internship performance;
- 3) Pearson's product-moment correlation coefficient (r) to establish the degree and direction of the relationship between theoretical preparation and clinical internship performance; and
- 4) Garret's Forecasting Efficiency Formula to determine the extent to which theoretical preparation predicts success in clinical internship performance.

RESULTS

The results of the study suggest that the theoretical preparation of pre-service elementary Mathematics teachers remains adequate but not yet sufficient to fully support effective classroom practice. Across the areas of General Education, Professional Education, and Field of Specialization, many respondents demonstrated foundational competencies; however, these competencies often required further strengthening to meet the demands of elementary teaching.

In the area of General Education, stronger preparation in Mathematics and Filipino indicates that respondents possess basic numerical reasoning and language skills essential for instruction. However, weaker preparation in Science, English, and Social Science reveals gaps in interdisciplinary knowledge. Since elementary teachers are expected to integrate multiple subject areas, these gaps may limit their ability to connect concepts across disciplines and respond effectively to diverse learning needs in the classroom.

Findings related to Professional Education highlight limited mastery of essential educational theories, including those drawn from academic psychology, sociology, philosophy, and legal foundations. This suggests that respondents may lack the conceptual understanding necessary to guide sound instructional decisions, classroom management, and learner-centered practices. Additionally, weaknesses in assessment skills—particularly in test construction and interpretation—indicate that assessment concepts may have been learned in a procedural rather than a conceptual manner, as tools for improving teaching and learning.

With regard to teaching principles and strategies, the results indicate moderate theoretical knowledge but difficulty in applying these concepts during actual classroom instruction. This gap points to a misalignment between coursework and clinical experiences, suggesting that theoretical learning is not consistently translated into effective teaching practice.

In the Field of Specialization (Elementary Mathematics), respondents demonstrated basic content knowledge; however, mastery was not consistently high. While some respondents showed strong preparation, many still required improvement, indicating that content knowledge alone is insufficient without strong pedagogical competence. Overall, the results emphasize the need for a more integrated approach in teacher education—one that strengthens theoretical foundations while closely aligning them with practical teaching experiences.

Table 1. Overall Level of Theoretical Preparation of Pre-Service Elementary Mathematics Teachers

Area	Mean	Description
General Education	84.44	Improvement Needed
Professional Education	82.59	Improvement Needed
Field of Specialization	81.88	Improvement Needed
Grand Mean	82.97	Improvement Needed

Overall, the results in Table 1 confirm that theoretical preparation across all components remained below the desired mastery level, underscoring the need for a stronger curricular emphasis before the clinical internship.

Table 2. Overall Clinical Internship Performance

Weighted Average	Percentage Equivalent	Frequency	Percentage	Description
4.45–5.00	95–100	15	15.63	Superior
3.95–4.44	90–94	19	19.79	Strong
3.45–3.94	85–89	28	30.21	Average
2.45–3.44	75–84	32	33.33	Improvement Needed
1.00–2.44	Below 75	1	1.04	Unsatisfactory

Clinical internship performance was generally rated as Average. While many respondents demonstrated satisfactory to strong teaching performance, a notable proportion still required improvement, suggesting that gaps in theoretical preparation may have constrained classroom effectiveness.

Table 3. Associational Influence of Theoretical Preparation on Clinical Internship

Areas Correlated	Computed r	Interpretation
General Education & Clinical Internship	0.19	Very Small Positive
Professional Education & Clinical Internship	0.27	Moderately Small Positive
Field of Specialization & Clinical Internship	0.26	Moderately Small Positive
Overall Theoretical Preparation & Clinical Internship	0.27	Moderately Small Positive

Correlation analysis revealed moderately small but positive relationships between theoretical preparation and clinical internship performance, with Professional Education and Field of Specialization demonstrating stronger associations than General Education.

Table 4. Percentage of Success in Clinical Internship Based on Theoretical Preparation

Areas Correlated	Efficiency	Percentage of Success
General Education & Clinical Internship	0.02	2%
Professional Education & Clinical Internship	0.04	4%
Field of Specialization & Clinical Internship	0.03	3%
Overall Theoretical Preparation & Clinical Internship	0.04	4%

Forecasting efficiency analysis indicates that theoretical preparation accounted for a modest proportion of clinical internship success. Although the predictive contribution was limited, the findings reinforce the importance of firm theoretical grounding complemented by effective mentoring and practical teaching experiences.

SUMMARY OF RESULTS

This study investigated the associational influence of theoretical preparation on the clinical internship performance of pre-service elementary Mathematics teachers using a descriptive–correlational research design. The respondents consisted of 96 prospective elementary Mathematics teachers who completed a pre-board examination covering General Education, Professional Education, and Field of Specialization, as well as clinical internship ratings provided by their supervisors.

Results revealed that the respondents' overall theoretical preparation required improvement, as reflected by a grand mean of 82.97. In General Education, respondents demonstrated relatively stronger preparation in Mathematics and Filipino, while lower levels of mastery were observed in Science,

English, and Social Science, indicating gaps in interdisciplinary readiness. The overall General Education grand mean of 84.44 suggested that respondents had not yet attained sufficient mastery across all subject areas expected of elementary teachers.

In Professional Education, findings showed that respondents needed improvement in all components, including Foundations of Education, Assessment of Learning, and Principles and Strategies of Teaching. The grand mean of 82.59 reflected limited mastery of educational theories, assessment practices, and pedagogical strategies essential for effective classroom instruction.

In the Field of Specialization (Elementary Mathematics), respondents demonstrated foundational content knowledge; however, the overall mean of 81.88 indicated that mastery remained below the level required for consistent instructional effectiveness.

Clinical internship performance results showed that respondents achieved an average performance, with a grand mean of 87.02, indicating satisfactory but improvable teaching competence during the practicum.

Correlation analysis identified a small, positive relationship between theoretical preparation and clinical internship performance, indicating that higher levels of theoretical preparation were associated with better clinical teaching outcomes. Forecasting efficiency analysis further revealed that theoretical preparation could predict approximately four percent (4%) of success in clinical internship, confirming its contributory—though not exclusive—role in teaching performance.

CONCLUSION

This study examined the relationship between theoretical preparation and clinical internship performance of pre-service elementary Mathematics teachers and established that theoretical preparation remains insufficient across General Education, Professional Education, and the Field of Specialization. Although respondents demonstrated average performance during clinical internship, the findings indicate that their classroom effectiveness can be strengthened through more robust and coherent theoretical grounding.

The results further revealed a positive, albeit modest, association between theoretical preparation and clinical internship performance, confirming that theoretical competence contributes to effective teaching practice. While theoretical preparation alone does not fully determine success during an internship, it provides a critical foundation for instructional decision-making, classroom management, and learner engagement. These findings reinforce the complementary nature of theory and practice in pre-service teacher education and underscore the need to strengthen their integration.

From a programmatic perspective, the study has important implications for teacher education institutions. Curricular coherence across General Education, Professional Education, and the Field of Specialization must be enhanced to ensure that theoretical instruction meaningfully supports clinical

practice. Emphasis should be placed on deepening conceptual understanding, pedagogical content knowledge, and assessment literacy, rather than relying primarily on procedural or examination-based learning outcomes.

The findings also highlight the importance of strengthening clinical internship programs as the culminating phase of pre-service education. Effective mentoring and supervision, grounded in current educational theories and evidence-based practices, are essential to maximizing the impact of theoretical preparation on teaching performance. Continuous professional development for clinical supervisors and cooperating teachers is therefore crucial to ensure alignment between coursework and practicum experiences.

Finally, the study provides a clear empirical basis for program enhancement in the preparation of elementary Mathematics teachers. By aligning theoretical coursework with clinical practice and reinforcing competency-based approaches to teacher preparation, institutions can better equip future teachers to meet contemporary classroom demands. Future research should further explore additional factors influencing clinical internship performance and evaluate the long-term effects of enhanced pre-service preparation on in-service teaching effectiveness.

RECOMMENDATIONS

Based on the findings and conclusions of this study, targeted actions are necessary to strengthen the preparation of pre-service elementary Mathematics teachers. The results indicate the need for closer alignment between theoretical coursework and clinical practice to ensure the development of essential teaching competencies. The following recommendations are offered to guide teacher education institutions, academic leaders, and future researchers toward meaningful program enhancement.

Teacher education institutions are encouraged to **review and critically evaluate the BEED Mathematics curriculum** to identify areas of strength and areas for improvement. This review should ensure that curricular content adequately prepares future teachers both **theoretically and clinically**, with emphasis on coherence across General Education, Professional Education, and the Field of Specialization.

Deans, department heads, and faculty members should align course syllabi with a **competency-based framework** that prioritizes core teaching competencies, deep conceptual understanding, and the practical application of knowledge. Instructional strategies should be intentionally designed to support the integration of theory and practice.

Instructional activities should be given priority over non-instructional or purely extracurricular engagements. Where co-curricular activities are required, these should be structured to directly reinforce classroom instruction, professional growth, and pedagogical competence.

Clinical internship programs should function as the culminating application of theoretical learning. Clinical supervisors and cooperating teachers must receive continuous professional development on current educational theories, instructional strategies, and assessment practices to ensure strong alignment between coursework and practicum experiences.

Future Research

Future research is necessary to deepen the understanding of teacher preparation and address the gaps identified in this study. Building on the present findings, subsequent investigations can examine how competencies develop over time and how they influence teaching effectiveness in real classroom settings. Expanding the scope of inquiry will contribute to evidence-based improvements in teacher education programs.

Future research is encouraged to focus on:

1. The development of core competencies among pre-service teachers.
2. The design and evaluation of competency development programs for student teachers.
3. Longitudinal trend analyses of BEED Mathematics students.
4. Other factors influencing clinical internship performance beyond theoretical preparation.

REFERENCES

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 59(5), 389–407. <https://doi.org/10.1177/0022487108324554>

Commission on Higher Education. (1999). CMO No. 11, series of 1999: Revised policies and standards for teacher education. CHED.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Darling-Hammond, L. (2006a). Constructing 21st-century teacher education. *Journal of Teacher Education*, 57(3), 300–314. <https://doi.org/10.1177/0022487105285962>

Darling-Hammond, L. (2006b). *Powerful teacher education: Lessons from exemplary programs*. Jossey-Bass.

Ellis, V., Steadman, S., & Mao, Q. (2020). Coming to a future near you? Teacher education in the globalised world. *Teaching and Teacher Education*, 95, Article 103072. <https://doi.org/10.1016/j.tate.2020.103072>

- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019).** *How to design and evaluate research in education* (10th ed.). McGraw-Hill Education.
- Garrett, H. E. (2008).** *Statistics in psychology and education*. Paragon International Publishers. (Original work published 1966)
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2012).** *Educational research: Competencies for analysis and applications* (10th ed.). Pearson Education.
- Kolb, D. A. (1984).** *Experiential learning: Experience as the source of learning and development*. Prentice Hall.
- König, J., Rothland, M., & Tachtsoglou, S. (2020).** Teachers' professional knowledge and classroom management: On the relation of general pedagogical knowledge and instructional quality. *Educational Studies in Mathematics*, 104, 1–19. <https://doi.org/10.1007/s10649-020-09968-7>
- Koo, J. B., Mwansasu, S., & Kapinga, O. S. (2025).** Roles, relationships, and experiences among participants in student teaching: Evidence from Malawi. *Teaching and Teacher Education*, 147, Article 104246. <https://doi.org/10.1016/j.tate.2025.104246>
- Leon, M. J. (1997).** *A study of beginning teachers and learning in the workplace* (Doctoral dissertation). Teachers College, Columbia University.
- Mangabat, L. B. (1994).** *Performance of the National Teachers College on-campus student teachers* (Master's thesis). National Teachers College, Manila, Philippines.
- Manuel, B., et al. (n.d.).** *New thrusts in Philippine education* (Vol. 2). Current Event Digest.
- National Council of Teachers of Mathematics. (2014).** *Principles to actions: Ensuring mathematical success for all*. National Council of Teachers of Mathematics.
- Paulsen, K. J. (1997).** *Pre-service education: Exploring alternative methods of instruction, advisement, and field-based supervision* (Doctoral dissertation). University of Nevada, Las Vegas.
- Pelletier, C. M. (2002).** *Strategies for successful student teaching: A comprehensive guide*. Allyn & Bacon.

Romero, C. (1982). *A study of the problems of student teachers in the Philippine Normal College in-campus and off-campus teaching* (Master's thesis). Adamson University, Manila, Philippines.

Santagata, R., König, J., Scheiner, T., Nguyen, H., & Kaiser, G. (2021). Mathematics teacher learning to notice: A systematic review of video-based professional development programs. *ZDM—Mathematics Education*, 53, 119–134. <https://doi.org/10.1007/s11858-020-01216-z>

Scheiner, T. (2020). The professional vision of (prospective) mathematics teachers. *Educational Studies in Mathematics*, 104, 91–110. <https://doi.org/10.1007/s10649-020-09950-3>

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1–22. <https://doi.org/10.17763/haer.57.1.j463w79r56455411>

Stewart, L. Y. (1997). *New teachers' induction and support: A comparison of program requirements as perceived by beginning teachers and district personnel officers* (Doctoral dissertation). University of Southern California.

University of Memphis, College of Education. (2004). *Handbook for advanced clinical practicum students*. Author.