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Teaching Preparedness, Demographic, and Academic Factors on Teaching Competencies: A Structural Equation Modelling Approach

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Abstract

The study investigates the moderating effects of demographic and academic factors on the relationship between of teaching preparedness and PPST-based teaching competencies among pre-service teachers acquired during the flexible learning modality. Utilizing the structural equation modelling approach, data were collected from 389 pre-service teachers at Cavite State University, Cavite Philippines. The findings indicate that seminar attendance and teaching preparedness significantly enhance PPST-based teaching competencies, while factors such as sex and support systems negatively influence these competencies. Academic performance in professional education, specialization, and general education courses did not have significant impact in the PPST-based teaching competencies. Findings underscore the importance of continuous professional development and comprehensive preparation programs to improve teaching practices. This study provides valuable insights for teacher education programs to strengthen effective teaching competencies in pre-service teachers.

Introduction

The COVID-19 pandemic has had a global impact. Since the announcement of the global pandemic on March 12, 2020, approximately 2,400 Higher Education Institutions have been forced to close, affecting 3.5 million students (World Health Organization, 2020). Despite the shutdown of universities, some HEIs have taken a proactive approach to continuing education. Instead of face-to-face learning, most HEIs have shifted to flexible learning and alternative delivery modalities of education (CHEd, 2020), utilizing technology and other ICT resources to the fullest.Teacher education institutions have quickly adopted flexible learning methods to improve learning environments and train future teachers (Flores & Gago, 2020). This sudden change has presented various challenges and restrictions for teacher educators and pre-service teachers (Carrillo & Flores, 2020) due to the rapid adoption of flexible learning and online classrooms (Hill, 2021; Ersin, Atay & Mede, 2020; Kiok et al., 2021). Pre-service teachers have met program requirements without a classroom practicum for the first time (Hill, 2021).

Teaching practicum is a crucial phase in teacher education programs (Kiok et al., 2021) as it enables pre-service teachers to connect theory with practice in a real classroom environment (Ersin, Atay & Mede, 2020). The pandemic has prevented pre-service teachers from engaging in traditional teaching practice, potentially limiting

their ability to fulfill practicum requirements. However, flexible learning modalities have provided educational opportunities for pre-service teachers to continue interacting with students conveniently regarding time, place, learning pace, and financial costs (Khurana, 2016). Synchronous online teaching has been utilized to replicate the social, cognitive, and instructional aspects of the teaching and learning process. This approach requires pre-service teachers to be adaptable to various instructional designs, thereby enhancing their teaching methods and delivery skills (Garrison & Anderson, 2000; Marshall & Kostka, 2020; Caskurlu & Richardson, 2020). Despite being trained in flexible learning environments through synchronous and asynchronous remote learning, preservice teachers must adapt to face-to-face teaching and should have acquired some skills as defined in the Philippines Professional Standards for Teachers (PPST).

The Philippines Professional Standards for Teachers (PPST) were established to enhance teacher quality, transitioning from the National Competency-based Teacher Standards (NCBTS) to PPST. This framework defines career stages, encourages ongoing professional development, and offers a consistent measure for evaluating teacher performance. PPST includes seven key areas: content knowledge and pedagogy, learning environment, diversity of learners, curriculum and planning, assessment and reporting, community linkages and professional engagement, and personal growth and professional development. Filipino teachers are expected to excel in their subjects, create engaging classrooms, respect student diversity, align with curriculum standards, use diverse assessment tools, build strong school-community relationships, and commit to continuous personal and professional growth. These standards aim to produce well-rounded, skilled, and globally competitive learners. During the pandemic, pre-service teachers adapted to remote education and faced challenges such as low self-confidence, technical issues, and communication barriers. Despite these hurdles, they embraced their roles and developed online teaching skills, changing their perspectives on technology and adopting innovative methods, feeling prepared for teaching.

Teaching readiness involves pre-service teachers feeling prepared for their roles, incorporating professional competencies essential for effective teaching. Hands-on practice and courses that simulate real classrooms are crucial. Research identifies gaps in areas like lesson planning, communication, and classroom management, emphasizing the need for targeted training programs. Factors influencing teaching readiness based on PPST standards include gender, age, marital status, support systems, type of cooperating school, and participation in professional development. Female teachers are often more engaged in professional development, and younger teachers bring contemporary knowledge, while older teachers offer practical experience. Support systems, including financial aid and mentorship, are crucial for developing competencies. Urban schools may provide more resources, while rural schools offer close-knit communities.

Participation in professional development enhances teaching competencies by keeping teachers current on educational practices. Educational background and academic performance also play roles, with practical experience through internships being vital. Technological proficiency is essential for creating interactive learning environments.

Personality traits like conscientiousness and extraversion impact teaching readiness, with conscientious

individuals achieving better outcomes. Marital status and support from family and institutions also influence teaching skills. Understanding these factors helps develop targeted approaches to support pre-service teachers' professional growth.

Given the limited hands-on teaching experience, presentation skills, and direct interaction with students these pre-service teachers have had, it becomes crucial to study their transition from flexible learning to in-person classes. This research seeks to gather benchmark information on their teaching preparedness and competencies. It aims to determine if these pre-service teachers have acquired the necessary skills and performance standards for effective teaching practice after more than two years of remote learning arrangements. The study seeks to find answers to the following questions:

1. How do teaching preparedness, demographic factors, and academic factors collectively impact PPST-based teaching competencies among pre-service teachers?
2. What is the direct effect of teaching preparedness on PPST-based teaching competencies among pre-service teachers?
3. How do specific demographic factors (e.g., age, gender, civil status, support systems, cooperating school, seminar attendance) influence PPST-based teaching competencies?
4. How do academic performance in the professional education, specialization, general education courses affect PPST-based teaching competencies among pre-service teachers?
5. To what extent do the combined effects of teaching preparedness, demographic factors, and academic factors explain the variance in PPST-based teaching competencies among pre-service teachers as analyzed through structural equation modelling?

Method

Research Design

This descriptive-correlational study used structural equation modelling to examine how demographic characteristics, academic factors, and teaching preparedness affected pre-service teachers' PPST-based abilities during flexible learning. The descriptive part focused on evaluating the participants' profiles and competencies, while the correlational part examined the links between these competencies and their preparedness for classroom teaching. This thorough approach offered valuable insights into how well-prepared pre-service teachers were and how their competencies matched their readiness for teaching.

Participants

The study involved two groups of pre-service teachers from the academic years 2022-2023 and 2023-2024, who were in their final year of teacher training at two campuses of Cavite State University in the Philippines. A total of 389 students were selected to represent the population for assessing teaching preparedness and competencies based on the PPST.

The inverse square root and gamma-exponential methods in R were used to assess sample size (Bulus, 2023). The

inverse square root approach calculates the standard error by taking the inverse square root of the sample size, yielding a minimum number of 372 with a margin of error of 0.029, significance level of 0.05, and power level of 0.8. Gamma-exponential approach, which corrects standard error estimation with exponential and gamma smoothing functions, returned a minimum number of 358 samples.

Instrument and Measures

This descriptive-correlational study used structural equation modelling to examine how demographic characteristics, academic factors, and teaching preparedness affected pre-service teachers' PPST-based abilities during flexible learning. The descriptive part focused on evaluating the participants' profiles and competencies, while the correlational part examined the links between these competencies and their preparedness for classroom teaching. This thorough approach offered valuable insights into how well-prepared pre-service teachers were and how their competencies matched their readiness for teaching.

Research Design

Data collection involved two self-administered survey questionnaires developed by the researchers:

PPST-Based Competencies Questionnaire

A researcher-made questionnaire given to cooperating teachers to assess the acquired PPST-based competencies of the pre-service teachers. The questionnaire was developed to assess for PPST-based teaching competencies for preservice teachers. The items in this questionnaire were based on the Philippines Professional Standards for Professional Teachers. It included the Content Knowledge and Pedagogy (CKP), Learning Environment (LET), Diversity of Learners (DLT), Curriculum and Planning (CPT), Assessment and Reporting (ART), Community Linkages and Professional Engagement (CLPE), and Personal Growth and Professional Development (PGPD).

Teaching Preparedness Questionnaire

A researcher-made questionnaire given to cooperating teachers to assess the acquired PPST-based competencies of the pre-service teachers. The questionnaire was developed to assess for PPST-based teaching competencies for preservice teachers. The items in this questionnaire were based on the Philippines Professional Standards for Professional Teachers. It included the Content Knowledge and Pedagogy (CKP), Learning Environment (LET), Diversity of Learners (DLT), Curriculum and Planning (CPT), Assessment and Reporting (ART), Community Linkages and Professional Engagement (CLPE), and Personal Growth and Professional Development (PGPD).

Validity and Reliability

The survey questionnaires went through a thorough validation process to ensure they were reliable and valid. This included expert reviews and pilot testing. The items were created based on research hypotheses and reviewed by

four experts from the university's student teaching program. These experts checked the content validity, provided feedback on clarity and relevance, and suggested changes to ambiguous or irrelevant items. Additionally, face validity was confirmed through interviews with 10 elementary and secondary school teachers who took the survey. Their feedback helped refine overly direct items and streamline the questionnaire to reduce response time.To assess reliability, the instrument was tested on 45 student-teachers who were not part of the actual study. Their responses were coded and analyzed to check internal consistency reliability.

Ethical Considerations

The research strictly followed ethical guidelines and standards. All subjects gave their consent, fully understanding the research's goals, methods, and their freedom to exit the research whenever they chose. Participant confidentiality and anonymity were safeguarded throughout the study. The research received ethical clearance from Cavite State University's review board.

Data Collection Procedure

The research procedure included the development, validation, pre-testing, and finalization of the survey questionnaires. Researchers ensured smooth data collection, which involved administering the questionnaires and gathering faculty evaluation results. The two surveys were administered to cooperating teachers and pre-service teachers.

Data Analysis Procedure

After gathering the data, the questionnaires were organized and tallied, showing that 396 copies had been returned, resulting in a response rate of about 95%. An initial check for partial answers and missing data identified seven questionnaires with unclear answers. These were excluded to avoid data inconsistencies during encoding and examination, leaving 389 fully completed questionnaires for analysis. Responses were scored using a range of 1 – 5 marks for strongly disagree to strongly agree, for affirmative statements. Negatively worded items were scored in the opposite order. The scores for all items within corresponding sub-scales were summed to create continuous data.

The initial statistical method utilized in this study involves descriptive analysis which included metrics of central tendency and variation, specifically mean, standard deviation, and qualitative descriptions based on the interval scale. Weighted means were analyzed using a designated conversion scale to provide valuable insights into the data. This analysis helped develop guidelines focused on enhancing the teaching internship experience in a flexible learning environment. Following these steps, this study aimed to provide insights into how teaching preparedness, demographic and academic factors impact the PPST-based teaching competencies among pre-service teachers.

The researchers confirmed the reliability of the instruments using the Cronbach's Alpha and Composite Reliability. Evaluating construct reliability to measure consistency among the items is deemed important

(Grabowski, 2018). According to Hair et al. (2014), a minimum of 0.7 Cronbach's Alpha and 0.6 Composite Reliability will establish the reliability of the constructs under consideration. The computed Cronbach's Alpha for the PPST-based competencies varied from 0.860 to 0.912, and from 0.855 to 0.912 for teaching preparedness. These scores show that both assessments reliably measure teaching preparedness in line with PPST-based competencies. To test construct validity, convergent and discriminant validity were evaluated. Convergent validity assesses the amount of variation each factor and its items have relative to measurement error (Amora et al., 2016), using Average Variance Extracted (AVE). Hair et al. (2014) established the standard for AVE at 0.5 for a construct to be accurate.

Table 1. Conversion Table on the Level of Teaching Preparedness and PPST-Based Teaching Competencies

Mean Range	Verbal Interpretation	
4.21 – 5.00	Exceptional Preparedness/ Teaching Competencies	Preservice teachers have an exceptional level of teaching preparedness and confidence/teaching competencies.
3.41 – 4.20	High Preparedness/ Teaching Competencies	Preservice teachers have a high level of teaching preparedness and confidence/teaching competencies.
2.61 – 3.60	Moderate Preparedness/ Teaching Competencies	Preservice teachers have a moderate level of teaching preparedness and confidence/teaching competencies.
1.81 – 2.60	Low Preparedness/ Teaching Competencies	Preservice teachers have a low level of teaching preparedness and confidence/teaching competencies.
1.00 – 1.80	Very Low Preparedness/ Teaching Competencies	Preservice teachers have a very low level of teaching preparedness and confidence/teaching competencies.

Discriminant validity checks if statements in each latent variables do not mislead respondents between variables (Kock, 2017), using the root of AVE. According to Hair et al. (2014), discriminant validity is achieved if the relationship of the latent variables does not exceed the relationship of reflective variables (diagonal score). Item loading measures the relationship between the construct and the element, with values above 0.5 indicating statistical significance (Amora et al., 2016).Structural Equation Modelling (SEM) was used to analyze the connections between the four main variables: demographic profiles, educational factors, teaching preparedness, and PPST-based teaching competencies. PLS-SEM allowed for the analysis of direct, indirect, and overall effects among these variables.

Results

A detailed analysis of the 389 preservice teachers' profiles, academic factors, teaching preparedness, and PPST-based teaching competencies is presented. Demographic profiles show that most participants are young, single,

and rely on parental support for schooling. They have mostly taught at private schools and attended seminars for professional development. Most preservice teachers have moderate to high technology competency and good GPAs across courses.

Student Teachers' Profiles

The pre-service teachers were profiled in terms of demographics, financial support, student-teaching environment, professional development, academic success across courses, and technological proficiency. Understanding these characteristics helps contextualize pre-service teachers' readiness and identify significant aspects that affect their development according to the Philippine Professional Standards for Teachers. The information provided illuminates preservice teachers' backgrounds and teaching competencies.

Most preservice teachers (53.98%) are 19-21 years old, followed by 24.42% in 16-18, 19.02% in 22-24, and 2.57% in 25-27. This suggests that most participants are in their late teens to early 20s, typical of undergraduate cohorts. Gender distribution is fairly balanced, with a slight female majority (52.70%) compared to males (47.30%). Civil status predominantly shows a single demographic (95.37%), with minimal representation from married (3.60%) and separated (1.03%) individuals. This suggests that the preservice teacher population is largely unmarried, consistent with their age range. In terms of financial support, a significant portion of preservice teachers rely on parental support (64.27%), while others benefit from scholarships (21.85%) and personal businesses (13.37%). Only a small fraction (0.51%) supports their studies through work. This highlights the critical role of parental and scholarship support in the educational pursuits of these preservice teachers. The type of school where student teaching was conducted is predominantly private (77.63%), with a smaller percentage in public schools (22.37%). This distribution may influence the teaching experiences and resource availability for the preservice teachers.

Seminar attendance, an indicator of professional development, varies widely. A majority (56.81%) attended 13-15 seminars, indicating high engagement in professional growth activities. Others attended 10-12 seminars (31.36%), 7-9 seminars (7.20%), 4-6 seminars (3.08%), and 1-3 seminars (1.54%).Grade Point Averages (GPAs) across different course categories provide insight into academic performance. In professional education courses, most preservice teachers have GPAs ranging from 1.56 to 2.15, with the highest concentration (22.37%) in the 1.56-1.75 range. Specialization courses follow a similar pattern, with the majority (21.59%) having GPAs between 1.96 and 2.15. General education courses show the highest GPA concentration in the 1.96-2.15 range (23.39%).

Technological proficiency among preservice teachers reveals that a majority are moderately proficient (58.10%), with a significant portion being proficient (31.11%) and a smaller group highly proficient (10.80%). This distribution indicates a need for further enhancement in technological skills to better align with modern educational demands.

Preservice Teachers' Teaching Preparedness in İn-Person Learning

Table 2 provides a summative overview of the teaching preparedness of preservice teachers in in-person learning,

categorized into several key areas: personal qualities, professional qualities, lesson planning, teaching skills, classroom management, ethics, and technical proficiency (Appendix 1). Each area is evaluated through various statements, with corresponding mean scores, standard deviations, and verbal interpretations.

Student Teachers' Profiles

The pre-service teachers were profiled in terms of demographics, financial support, student-teaching environment, professional development, academic success across courses, and technological proficiency. Understanding these characteristics helps contextualize pre-service teachers' readiness and identify significant aspects that affect their development according to the Philippine Professional Standards for Teachers. The information provided illuminates preservice teachers' backgrounds and teaching competencies.

Table 2. Preservice Teachers' Teaching Preparedness in In-Person Learning

Teaching Preparedness in In-Person Learning Environment	Mean	Standard Deviation	Verbal Interpretation
Personal Qualities	4.33	0.982	Exceptional Preparedness
Professional Qualities	4.38	0.973	Exceptional Preparedness
Lesson Planning	4.36	1.042	Exceptional Preparedness
Teaching Skill	4.25	0.927	Exceptional Preparedness
Classroom Management	4.35	0.990	Exceptional Preparedness
Ethics	4.44	1.010	Exceptional Preparedness
Technical Proficiency	4.35	0.965	Exceptional Preparedness

Note: 4.21–5.00 = Exceptional Preparedness, 3.41–4.20 =High Preparedness, 2.61–3.60 = Moderate Preparedness, 1.81–2.60 = Low Preparedness, 1.00–1.80 = Very Low Preparedness.

Personal Qualities (PerQ)

The table indicates that preservice teachers rate themselves exceptionally high in personal qualities, such as patience, empathy, positive attitude, and the ability to build strong rapport with students. The mean scores for the five items under this construct range from 4.25 to 4.38, with SD of around 1. These high scores suggest that preservice teachers feel well-prepared in terms of personal attributes essential for effective teaching. The mean personal qualities score is 4.33, suggesting great self-perception in this domain.

Professional Qualities (ProfQ)

Professional qualities mean scores for the five items in this category are high, ranging from 4.28–4.40. These items assess commitment to professional ethics, opportunities for growth, work ethic, effective communication, and maintaining professionalism. Like the personal qualities section, the standard deviations indicate some variability but high self-assessment. Preservice teachers' teaching preparedness is shown by the mean professional qualities score of 4.38, which is exceptional.

Lesson Planning (LP)

Preservice teachers are also exceptional in lesson planning, scoring 4.33–4.42 in the five items. They are assessed on their abilities to match lesson plans with curricular standards, produce interesting lessons, modify plans for particular students, integrate technology, and improve plans. The lesson planning mean is 4.36, with an exceptional interpretation, indicating teachers' confidence in their abilities to plan and deliver effective classes.

Teaching Skills (TS)

While still highly valued, teaching skills had significantly lower mean ratings than other categories, especially in subject matter knowledge (4.13) and explaining complicated concepts (4.12). Skills related to engaging students, providing feedback, and using different teaching tactics scored better, averaging 4.25 to 4.26. The mean teaching skills score is 4.25, which is great, showing that preservice teachers feel competent in their teaching skills but might improve.

Classroom Management (CM)

At mean range of 4.24–4.33, preservice teachers assess their classroom management skills highly. They are assessed on their capacity to organize surroundings, manage disturbances, assure safety, and adapt management strategies. Classroom management averages 4.35, indicating great preparedness to maintain an efficient learning environment.

Ethics

Preservice teachers often score 4.31–4.52 on ethical norms. Their dedication to ethics, secrecy, fairness, non-discrimination, and ethical behavior is assessed. The ethics mean is 4.44, which is exceptional, indicating high ethical teaching.

Technical Proficiency (TP)

Technically, preservice teachers are well-prepared, with all items scoring over 4.2. The average technical proficiency score is 4.35, with 0.965 standard deviation. This shows technical proficiency scores are consistent across items.

Preservice Teachers' Acquired PPST-Based Competencies

Table 3 shows cooperating teachers' assessments of preservice teachers' Philippine Professional Standards for Teachers (PPST) skills during flexible learning. The table classifies competences into CKP, LE, DL, CP, AR, CLPE, and PGPD (Appendix 2). All competencies are assessed with mean scores, standard deviations, and verbal interpretations.

Table 3. Preservice Teachers' Acquired PPST-Based Competencies Acquired during the Flexible Learning Modality as Perceived by Cooperating Teachers

PPST-Based Competencies	Mean	Standard Deviation	Verbal Interpretation
Content Knowledge and Pedagogy (CKP)	4.28	0.905	Exceptional Proficiency
Learning Environment (LE)	4.26	0.929	Exceptional Proficiency
Diversity of Learners (DL)	4.40	0.955	Exceptional Proficiency
Curriculum and Planning (CP)	4.26	0.928	Exceptional Proficiency
Assessment and Reporting (AR)	4.33	0.910	Exceptional Proficiency
Community Linkages and Professional Engagement (CLPE)	4.32	0.832	Exceptional Proficiency
Personal Growth and Professional Development (PGPD)	4.40	0.887	Exceptional Proficiency

Note: 4.21–5.00 = Exceptional Proficiency, 3.41–4.20 = High Proficiency, 2.61–3.60 = Moderate Proficiency, 1.81–2.60 = Low Proficiency, 1.00–1.80 = Very Low Proficiency.

Content Knowledge and Pedagogy (CKP)

The preservice teachers exhibited an exceptional level of proficiency in CKP. Specific aspects within this domain, such as acquiring a comprehensive understanding of the subject matter (mean = 4.29, SD = 0.903) and effectively integrating real-world examples (mean = 4.51, SD = 0.881), received exceptionally high ratings. The overall mean score for this domain was 4.28 (SD = 0.905), signifying exceptional competence in conveying complex concepts and adapting teaching methods to accommodate diverse learners.

Learning Environment (LE)

Within the learning environment domain, preservice teachers were recognized for creating positive and inclusive settings, establishing clear expectations, maintaining organized course structures, and fostering active participation. Noteworthy items included maintaining a well-organized course structure (mean = 4.34, SD = 0.930) and promptly addressing technical issues (mean = 4.26, SD = 0.929). The overall mean score was 4.26 (SD = 0.929), reflecting exceptional proficiency in developing supportive and effective learning environments.

Diversity of Learners (DL)

In this domain, preservice teachers excelled in addressing diverse learning needs, providing necessary accommodations, promoting inclusivity, and adapting instructional materials. A particularly notable item was providing accommodations and support those with varied learning styles and abilities, which scored a mean of 4.47 (SD = 0.937). The overall mean for this domain was 4.40 (SD = 0.955), indicating exceptional proficiency in meeting the varied needs of learners.

Curriculum and Planning (CP)

Preservice teachers demonstrated high proficiency in curriculum and planning, aligning curricula with standards, employing backward design, and reflecting on curriculum effectiveness. The item concerning regular reflection on the curriculum's effectiveness scored a mean of 4.37 (SD = 0.912). The overall mean score for this domain was 4.26 (SD = 0.928), signifying exceptional capability in planning and implementing educational curricula.

Assessment and Reporting (AR)

In the domain of assessment and reporting, preservice teachers showcased exceptional proficiency in designing assessments, providing feedback, employing diverse assessment methods, maintaining records, and utilizing assessment data for instructional decisions. The item on maintaining accurate records and communicating progress scored a mean of 4.40 (SD = 0.809). The overall mean for this domain was 4.33 (SD = 0.910), highlighting their strong capabilities in evaluating and reporting student performance.

Community Linkages and Professional Engagement (CLPE)

This domain revealed exceptional proficiency in engaging with parents and communities, collaborating with colleagues, participating in professional advancement, and contributing to the learning community. The item on collaborating with colleagues scored a mean of 4.35 (SD = 0.880). The overall mean was 4.32 (SD = 0.832), reflecting strong engagement and professional collaboration.

Personal Growth and Professional Development (PGPD)

Lastly, in personal growth and professional development, preservice teachers were perceived as highly proficient in seeking professional advancement, engaging in reflection and self-assessment, setting professional goals, and committing to lifelong learning. The item on commitment to lifelong learning scored a mean of 4.45 (SD = 0.969). The overall mean score for this domain was 4.40 (SD = 0.887), indicating exceptional proficiency in personal and professional growth.

Assessing the Measurement Model

This step is essential to ensure the quality of the criteria used for constructs, items, questions, and variables before advancing to the structural model evaluation. This process provides valuable insights into the assessment of instruments during analysis. Convergent validity determines whether the constructs correspond with others sharing the same measurement objective. In the context of reflective measurement models in PLS-SEM, the average variance extracted (AVE) is utilized. According to the criterion established by Hair et al. (2014), an AVE threshold of 0.5 is required to indicate convergent validity. Consequently, a construct is considered convergently valid if its AVE exceeds 0.5. Additionally, the reliability of the constructs is evaluated using Cronbach’s Alpha (CA) and Composite Reliability (CR).To deem a construct and its items reliable, the CA value should be at least

0.7, and the CR value should be at least 0.6 (Hair et al., 2014). However, as Cronbach's Alpha is affected by the number of items in a construct and often underestimates internal consistency reliability, composite reliability is considered a more appropriate measure.

Table 3. Preservice Teachers' Acquired PPST-Based Competencies Acquired during the Flexible Learning Modality as Perceived by Cooperating Teachers

Construct/Item	**Item Loading**	**AVE**	**CR**	**CA**
Personal Qualities		0.507	0.836	0.887
Item 1	0.787			
Item 2	0.611			
Item 3	0.713			
Item 4	0.694			
Item 5	0.744			
Professional Qualities		0.590	0.877	0.855
Item 1	0.656			
Item 2	0.822			
Item 3	0.783			
Item 4	0.803			
Item 5	0.764			
Lesson Planning		0.504	0.835	0.891
Item 1	0.621			
Item 2	0.755			
Item 3	0.802			
Item 4	0.690			
Item 5	0.668			
Teaching Skill		0.506	0.836	0.851
Item 1	0.684			
Item 2	0.786			
Item 3	0.747			
Item 4	0.618			
Item 5	0.710			
Classroom Management		0.518	0.842	0.889
Item 1	0.829			
Item 2	0.640			
Item 3	0.652			
Item 4	0.737			
Item 5	0.724			
Ethics		0.557	0.862	0.912

Construct/Item	Item Loading	AVE	CR	CA
Item 1	0.855			
Item 2	0.691			
Item 3	0.712			
Item 4	0.751			
Item 5	0.711			
Technical Proficiency		0.502	0.832	0.882
Item 1	0.671			
Item 2	0.612			
Item 3	0.654			
Item 4	0.894			
Item 5	0.678			
Content Knowledge and Pedagogy		0.501	0.832	0.893
Item 1	0.877			
Item 2	0.618			
Item 3	0.657			
Item 4	0.717			
Item 5	0.641			
Learning Environment		0.548	0.858	0.864
Item 1	0.698			
Item 2	0.828			
Item 3	0.765			
Item 4	0.717			
Item 5	0.683			
Diversity of Learners		0.575	0.870	0.898
Item 1	0.786			
Item 2	0.625			
Item 3	0.836			
Item 4	0.685			
Item 5	0.834			
Curriculum and Planning		0.573	0.868	0.860
Item 1	0.783			
Item 2	0.588			
Item 3	0.831			
Item 4	0.646			
Item 5	0.894			

Construct/Item	Item Loading	AVE	CR	CA
Assessment and Reporting		0.617	0.889	0.889
Item 1	0.815			
Item 2	0.888			
Item 3	0.767			
Item 4	0.669			
Item 5	0.773			
Community Linkages and Professional Engagement		0.558	0.863	0.912
Item 1	0.752			
Item 2	0.694			
Item 3	0.774			
Item 4	0.795			
Item 5	0.715			
Personal Growth and Professional Development		0.537	0.852	0.882
Item 1	0.750			
Item 2	0.770			
Item 3	0.832			
Item 4	0.623			
Item 5	0.670			

Notes: All item indicators are significant at 0.001 ($p < 0.001$). AVE = average variance extracted; CR = composite reliability; CA = Cronbach's alpha

Validity and Reliability of the Constructs and their Items

The table provides a thorough evaluation of various constructs and their associated items, focusing on metrics of validity and reliability. In this context, item loadings and Average Variance Extracted (AVE) are critical measures, where values greater than 0.50 are necessary to ensure both convergent validity and construct reliability. Item loadings represent the correlation between each item and the construct it aims to measure. For construct validity, loadings should exceed 0.50. In this table, all items meet or surpass this threshold, with the highest loadings observed in "Content Knowledge and Pedagogy" (Item 1 = 0.877) and "Ethics" (Item 1 = 0.855). This indicates strong correlations between the items and their respective constructs, signifying good construct validity.

AVE measures the amount of variance captured by a construct relative to the amount of variance due to measurement error. An AVE value greater than 0.50 is desirable. All constructs in this table have AVE values above 0.50, confirming adequate convergent validity. For example, Professional Qualities and Assessment and Reporting have AVE values of 0.590 and 0.617, respectively, indicating these constructs capture a significant portion of variance from their items.CR assesses the internal consistency of the items within a construct. A CR

value above 0.70 is considered acceptable, and all constructs in this analysis exceed this threshold. Notably, Community Linkages and Professional Engagement has a CR of 0.863, and Personal Growth and Professional Development has a CR of 0.852, both reflecting high internal consistency.

CA is another measure of internal consistency, with values above 0.70 indicating good reliability. All constructs demonstrate CA values above this benchmark, such as Ethics (CA = 0.912) and Teaching Skill (CA = 0.851), indicating reliable measurement across all items within these constructs. The constructs personal qualities, professional qualities, lesson planning, teaching skill, classroom management, ethics, technical proficiency, content knowledge and pedagogy, learning environment, diversity of learners, curriculum and planning, assessment and reporting, community linkages and professional engagement, and personal growth and professional development all exhibit strong validity and reliability. Specifically, all constructs meet the required item loading and AVE thresholds, ensuring that each construct reliably measures what it intends to capture. High CR and CA values further reinforce the internal consistency of these constructs, indicating that the items consistently reflect the underlying constructs.

In summary, the table indicates that all constructs have been effectively validated and are reliable measures within the specified context. Constructs such as assessment and reporting and community linkages and professional engagement particularly stand out for their high validity and reliability scores. To further enhance the robustness of these constructs, continuous review and refinement based on item performance and respondent feedback are recommended. This will ensure sustained measurement accuracy and reliability in future assessments.

Evaluation of the Structural Model

Following the evaluation of the measurement model, which ensures the quality of the criteria for constructs, items, and other variables, the structural model assessment is conducted. This assessment addresses collinearity issues, evaluates the significance and relevance of the structural model relationships, and compares different models (Hair, Hult, Ringle, & Sarstedt, 2017).

Direct Effects of Teaching Preparedness on PPST-Based Teaching Competencies

Teaching preparedness is a crucial factor in determining teaching competencies among pre-service teachers. This section examines the direct effects of various components of teaching preparedness—such as ethics, classroom management, teaching skills, lesson planning, professional qualities, and personal qualities—on PPST-based teaching competencies. Figure 1 displays the structural equation model (SEM) employed to analyze these relationships, elucidating the pathways through which teaching preparedness impacts the professional practices of pre-service teachers.

The SEM delineates the significant direct pathways from diverse dimensions of teaching preparedness to PPST-based competencies, underscoring the importance of comprehensive preparatory activities. By understanding

these direct effects, we can pinpoint key areas of focus in teacher education programs that bolster the preparedness of pre-service teachers, ultimately fostering more effective and competent teaching practices.

Teaching Preparedness (TPT)

The direct impact of teaching preparedness on PPST-based teaching competencies is both significant and positive, with an estimated value of 0.393 (S.E. = 0.174, C.R. = 2.258, p = .024). This underscores the critical role of thorough teaching preparation in enhancing the professional practices of pre-service teachers.

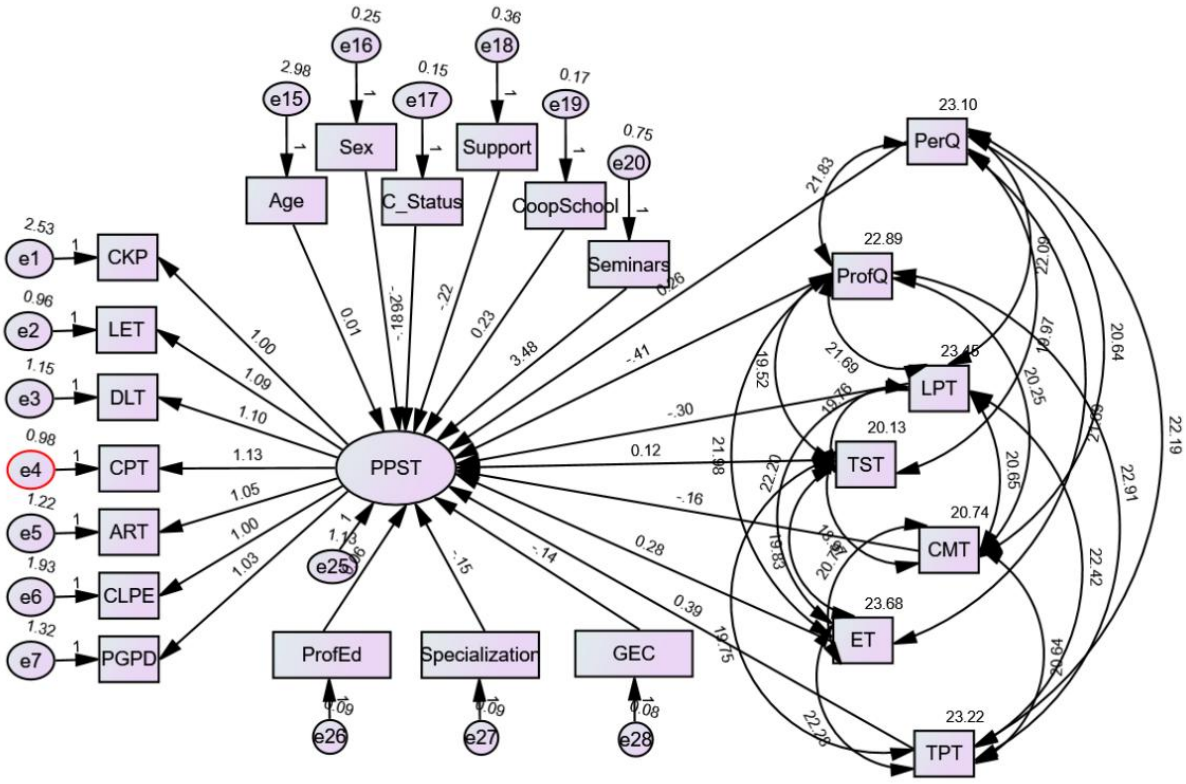

Figure 1. Structural Equation Model on the Joint Prediction of Teaching Preparedness, Demographic Profiles, and Academic Factors on PPST-Based Teaching Competencies

Ethics (ET)

The direct impact of ethics on PPST-based teaching competencies is highly significant and positive, with an estimate of 0.284 (S.E. = 0.045, C.R. = 6.280, p < .001). This emphasizes the pivotal role of ethical standards in fostering effective teaching practices.

Classroom Management (CMT)

The direct effect of classroom management on PPST-based teaching competencies is highly significant and negative, with an estimate of -0.159 (S.E. = 0.048, C.R. = -3.326, p < .001). This indicates that challenges in

classroom management can adversely affect teaching competencies, highlighting the necessity for improved training in classroom management.

Teaching Skills (TST)

The direct influence of teaching skills on PPST-based teaching competencies is significant and positive, with an estimate of 0.118 (S.E. = 0.039, C.R. = 3.009, p = .003). This suggests that strong teaching skills positively enhance professional practice.

Lesson Planning (LPT)

The direct effect of lesson planning on PPST-based teaching competencies is highly significant and negative, with an estimate of -0.299 (S.E. = 0.064, C.R. = -4.686, p < .001). This implies that difficulties in lesson planning can undermine teaching competencies, indicating a need for better support in lesson planning.

Professional Qualities (ProfQ)

The direct impact of professional qualities on PPST-based teaching competencies is significant and negative, with an estimate of -0.413 (S.E. = 0.144, C.R. = -2.861, p = .004). This suggests that perceived deficiencies in professional qualities may detrimentally affect teaching competencies.

Personal Qualities (PerQ)

The direct effect of personal qualities on PPST-based teaching competencies is highly significant and positive, with an estimate of 0.256 (S.E. = 0.050, C.R. = 5.104, p < .001). This underscores the importance of personal attributes such as patience, empathy, and a positive attitude in professional practice.

Direct Effects of Demographic Factors on PPST-Based Teaching Competencies

Understanding the factors influencing PPST-based teaching competencies among pre-service teachers is essential for developing effective teacher education programs. The Philippine Professional Standards for Teachers (PPST) provide a framework for assessing these competencies, encompassing content knowledge, pedagogy, and professional engagement. This section examines the direct effects of demographic factors—such as age, sex, civil status, support systems, and the type of cooperating school—on PPST-based teaching competencies. Figure 1 presents the structural equation model (SEM) used to analyze these relationships, highlighting the pathways through which these demographic factors impact teaching competencies.

The SEM illustrates the intricate interplay between various demographic variables and their direct influence on the PPST-based competencies of pre-service teachers. By examining these pathways, we can discern which demographic factors significantly contribute to or impede the development of essential teaching skills, thereby

informing targeted interventions to support teacher development.

Age

The direct effect of age on PPST-based teaching competencies is not significant, with an estimate of 0.010 (S.E. = 0.033, C.R. = 0.303, p = .762). This indicates that the age of pre-service teachers does not significantly influence their professional practice as measured by the PPST.

Sex

The direct effect of sex on PPST-based teaching competencies is significant and negative, with an estimate of -0.255 (S.E. = 0.116, C.R. = -2.209, p = .027). This suggests that male pre-service teachers tend to have lower PPST-based teaching competencies compared to their female counterparts, highlighting a need for targeted interventions to support male pre-service teachers in achieving comparable competency levels.

Civil Status

The direct effect of civil status on PPST-based teaching competencies is not significant, with an estimate of -0.176 (S.E. = 0.150, C.R. = -1.175, p = .240). This implies that the marital status of pre-service teachers does not significantly impact their teaching competencies.

Support to Studies

The direct effect of support on PPST-based teaching competencies is significant and negative, with an estimate of -0.219 (S.E. = 0.096, C.R. = -2.290, p = .022). This suggests that the type of support (e.g., financial, emotional) received by pre-service teachers negatively affects their PPST-based teaching competencies. This unexpected result warrants further investigation to understand the underlying causes.

Type of Cooperating School

The direct effect of the type of cooperating school on PPST-based teaching competencies is marginally non-significant, with an estimate of 0.230 (S.E. = 0.138, C.R. = 1.664, p = .096). This suggests a potential positive impact of the type of cooperating school on teaching competencies, although the effect is not statistically significant.

Seminar Attendance

The direct effect of seminar attendance on PPST-based teaching competencies is highly significant and positive, with an estimate of 3.479 (S.E. = 0.105, C.R. = 33.043, p < .001). This underscores the critical role of participating in professional development seminars in enhancing the teaching competencies of pre-service teachers.

Direct Effects of Academic Factors on PPST-Based Teaching Competencies

Academic factors are instrumental in shaping the teaching competencies of pre-service teachers, as delineated by the Philippine Professional Standards for Teachers (PPST). This section explores the direct effects of various academic factors—such as GPA in professional education courses, specialization courses, and general education courses—on PPST-based teaching competencies. Figure 1 illustrates the structural equation model (SEM) employed to analyze these relationships, depicting the direct pathways through which these academic variables impact the professional practices of pre-service teachers.

The SEM offers a comprehensive perspective on how academic performance in different course categories influences the development of essential teaching competencies. By examining these direct effects, we can gain a deeper understanding of the academic foundations that contribute to effective teaching practices, thereby informing curriculum design and academic support strategies to enhance teacher preparation programs.

GPA in Professional Education Courses (ProfEd)

The direct effect of GPA in professional education courses on PPST-based teaching competencies is not significant, with an estimate of 0.065 (S.E. = 0.195, C.R. = 0.331, p = .740). This indicates that academic performance in professional education courses does not significantly influence PPST-based teaching competencies.

GPA in Specialization Courses

The direct effect of GPA in specialization courses on PPST-based teaching competencies is not significant, with an estimate of -0.152 (S.E. = 0.188, C.R. = -0.808, p = .419). This suggests that specialization courses do not have a significant impact on PPST-based teaching competencies.

GPA in General Education Courses (GEC)

The direct effect of GPA in general education courses on PPST-based teaching competencies is not significant, with an estimate of -0.137 (S.E. = 0.199, C.R. = -0.689, p = .491). This implies that academic performance in general education courses does not significantly affect PPST-based teaching competencies.

The study reveals that demographic factors such as sex and support to studies have significant effects on PPST-based teaching competencies, with male teachers and those receiving certain types of support exhibiting lower competencies. Teaching preparedness, ethics, and personal qualities positively influence PPST-based competencies, while difficulties in classroom management, lesson planning, and professional qualities negatively impact them. Seminar attendance significantly enhances teaching competencies. Furthermore, improved PPST-based competencies positively influence various aspects of teaching practice, including content knowledge, learning environment, diversity of learners, curriculum planning, assessment, community engagement, and

personal growth. These findings underscore the importance of comprehensive preparation programs and continuous professional development for pre-service teachers.

Discussion

This study sheds light on pre-service teachers' PPST-based teaching competencies. The combined effects of teaching readiness, demographic characteristics, and academic factors on these competences provide a holistic view of teaching competencies. This emphasizes the need of considering several factors while establishing teaching skills strategies.

Teaching readiness positively affects PPST-based teaching competencies. This shows the importance of thorough preparatory activities like professional development seminars and practical teaching experiences in improving pre-service teachers' professional practice. Rigorous training programs prepare pre-service teachers, improving teaching outcomes. This supports prior research on teacher preparation and professional development improving teaching effectiveness. Desimone and Garet (2015) underline that good professional development is content-focused, active learning, collaborative, leverages models of effective practice, provides coaching and expert support, feedback and reflection, and is sustained. Darling-Hammond et al. (2017) also note that rigorous, prolonged, and content-focused professional development programs can increase instructors' instruction and student learning.

Strakova (2015) discovered that pre-service teachers need teaching preparedness, including practical teaching experience and professional development, to move to professional teaching jobs. This confirms the current study's emphasis on practical experiences in teacher preparation. Practice teaching bridges theoretical knowledge and practical application, which is necessary for building successful teaching skills, according to Girgin and Akcanca (2021).Demographics also affect PPST-based teaching competencies. The study shows that certain demographic characteristics like sex and support systems greatly affect these skills. Lower teaching competencies in male pre-service teachers and those reliant on certain supports suggest tailored interventions are needed.

Mahdi and Al-Dera (2013) found that gender and support networks affect teaching preparedness and effectiveness. Their study indicated that female instructors are more prepared and interested in professional development than male teachers. Abarro (2018) also found that pre-service teachers need financial aid and coaching to build teaching skills. According to Yu (2021), demographic aspects including gender and support networks greatly affect online learning results, which can be used to flexible learning environments' teaching competencies. Nganga et al. (2020) believe demographic-specific support techniques can improve teaching competencies for diverse pre-service teachers.

Unexpectedly, academic achievement in professional education, specialty, and general education courses does not alter PPST-based teaching skills. This shows that practical teaching experience and professional growth may be more important in building good teaching skills. Academic knowledge is vital, but applying it to teaching situations improves teaching skills. Korthagen et al. (2014) agree, emphasizing the need to integrate theory and

practice in teacher preparation programs. They believe teacher education should emphasize reflective teaching and real-world experiences to assist pre-service teachers apply theory.

Koehler and Mishra (2009) agree that practical experience and theoretical knowledge used in real-world teaching contexts are more important than academic performance for teaching abilities. Their technological pedagogical content knowledge (TPACK) framework emphasizes context-specific teaching skills beyond academic knowledge. This study shows the complex relationship between teaching readiness, demographic characteristics, and academic aspects using structural equation modelling (SEM). SEM provides a thorough framework for understanding how these variables explain a major percentage of PPST-based teaching competency variance. This method enables for sophisticated study of factor relationships, revealing their combined impacts.

Previous educational research using SEM found similar connections. SEM is good at examining complex causal relationships and explaining how components interact, according to Hair et al. (2014). SEM is especially useful in educational research, as Jentsch and König (2022) explain how personal and contextual factors affect teaching competencies. The findings of this study match teacher readiness and competency literature. The current study's focus on teaching preparedness in flexible learning environments is similar to Flores and Gago (2020)'s study on pre-service teachers' online learning problems and opportunities. They discovered that focused support and professional development helped pre-service instructors adapt to online instruction.

Hill (2021) and Ersin et al. (2020) emphasize the value of practical teaching and professional development in improving teaching skills. Hill (2021) observed that pre-service teachers who did e-practicum during the COVID-19 epidemic had considerable teaching skills without face-to-face interaction. Ersin et al. (2020) also note that e-practicum improves pre-service teachers' online teaching readiness and competency. Walker and Gleaves (2016) also showed that effective teaching competencies require ongoing professional growth and the development of personal traits like empathy and adaptability. According to their theoretical framework for creating the caring higher education teacher, personal qualities are crucial to effective teaching, validating the current study's findings on teacher training programs.

Conclusion

The study emphasizes continual professional development and comprehensive preparation programs to improve pre-service teachers' teaching skills. Teacher education programs can improve teaching practices by addressing the highlighted criteria and using this research. This can improve educational outcomes for teachers and students. High-quality education requires pre-service teachers to be well-prepared and supported.

Teacher education programs should include rigorous training and professional development to prepare teachers. Additional help is needed for demographic groups with lower capabilities, such as male pre-service teachers and those using support systems. More practical teaching experiences and ensuring pre-service teachers to apply theoretical information in real-world situations would improve teaching competencies.

Recommendations

Please use 10-point font size. Please margin the text to the justified. Manuscripts should be 1.5 times spaced. Footnotes and endnotes are not accepted. All relevant information should be included in main text. Do not indent paragraphs; leave a space of one line between consecutive paragraphs. Do not underline words for emphasis. Use italics instead. Both numbered lists and bulleted lists can be used if necessary. Before submitting your manuscript, please ensure that every in-text citation has a corresponding reference in the reference list. Conversely, ensure that every entry in the reference list has a corresponding in-text citation.

Subdivide text into unnumbered sections, using short, meaningful sub-headings. Please do not use numbered headings. Please limit heading use to three levels. Please use 12-point bold for first-level headings, 10-point bold for second-level headings, and 10-point italics for third -level headings with an initial capital letter for any proper nouns. Leave one blank line (1.5 times spaced) before and after each heading. (Exception: no blank line between consecutive headings.) Please margin all headings to the left.

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