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An Analysis of the Licensure Examination for Teachers Performance of BEd Graduates at Guimaras State University (2019-2023)

Efren S. Tellerma

Jasmin T. Gadian

Rodrigo G. Paglomutan Jr.

Guimaras State University

ABSTRACT Licensure examination performance provides Teacher Education Institutions with an important basis for monitoring graduate outcomes and strengthening teacher preparation. This study examined the performance of first-time Bachelor of Elementary Education (BEd) examinees from Guimaras State University (GSU) in the Licensure Examination for Teachers/Licensure Examination for Professional Teachers (LET/LEPT) across examination administrations covered from 2019 to 2023. Specifically, it determined institutional passing and failure rates and compared them with corresponding national elementary-level passing rates, and described average ratings in General Education and Professional Education. Using a descriptive quantitative design, the study analyzed secondary institutional examination records of 70 first-time GSU BEd examinees and official national examination results reported by the Professional Regulation Commission. Of the 70 examinees, 59 passed, yielding an overall institutional passing rate of 84.29%. GSU exceeded the corresponding national elementary-level passing rate in four of the five examination administrations with institutional first-time examinees. General Education ratings remained relatively stable across examination years, while Professional Education ratings varied more and averaged higher than General Education in later examination years. The findings indicate generally favorable licensure performance relative to national benchmarks and provide a positive baseline for continued institutional monitoring and enhancement of teacher preparation. Sustained data-driven monitoring, targeted academic support, and alignment of preparation with licensure competencies may help promote more consistent and sustainable LET/LEPT outcomes.

Keywords: *BEd graduates, licensure examination, LET performance, passing rate, teacher education*

INTRODUCTION

Teacher quality is fundamental to effective education because teachers translate curriculum standards into meaningful learning experiences. In the Philippines, graduates of teacher education programs who intend to enter the teaching profession must meet professional licensure requirements administered by the Professional Regulation Commission (PRC) through the Professional Regulatory Board for Professional Teachers. The Licensure Examination for Teachers (LET), now called the Licensure Examination for Professional Teachers (LEPT), is an important mechanism for assessing the competencies expected of prospective teachers. For the elementary level, the PRC identifies General Education and Professional Education as the major examination components. Thus, the passing rates and subject-area ratings of Bachelor of Elementary Education (BEd) graduates provide measurable information about their performance in the professional licensure examination (Professional Regulation Commission [PRC], 2012).

Licensure examination performance is important not only to individual graduates but also to Teacher Education Institutions (TEIs). For graduates, passing the examination fulfills a major professional requirement for entering the teaching profession. For TEIs, institutional licensure results provide evidence to monitor graduates' examination performance across different examination periods. Passing and failure rates can reveal patterns of improvement, decline, or stability, while ratings in General Education and Professional Education provide additional information on graduates' performance in the major examination components. Examining these indicators over several examination years therefore provides a broader picture of licensure performance than relying on a single examination period.

Previous studies demonstrate the value of analyzing licensure examination performance longitudinally. Navida (2022) examined the LET performance of teacher education programs at Pangasinan State University–Alaminos City Campus from 2014 to 2019. The study compared institutional passing rates with national passing rates and found that the institution generally performed above the national level during the period examined. The findings demonstrated the usefulness of monitoring institutional passing rates across several years and using national performance as a benchmark for interpreting institutional outcomes. Such comparisons provide a broader context for determining whether institutional licensure performance follows, exceeds, or falls below national patterns.

Similarly, Bugwak (2023) analyzed the LEPT performance of BEEd graduates of Davao Oriental State University–San Isidro Campus using documentary data from official PRC examination results. The study employed frequencies, percentages, examination ratings, and comparisons with the national passing rate to examine graduates' performance across examination periods. Results showed variation in institutional performance and highlighted the importance of establishing mechanisms to continuously monitor graduates' licensure examination outcomes. These findings suggest that longitudinal analysis of passing rates and examination ratings can provide TEIs with evidence for identifying patterns that may warrant further academic attention.

Licensure performance should be evaluated beyond binary pass-or-fail outcomes. For elementary-level examinees, General Education and Professional Education constitute distinct examination domains (PRC, 2012). Evaluating component-level ratings provides a nuanced profile of graduate outcomes, revealing variations that overall passing rates might obscure. Although subject-area analysis complements overall trends, these differences should be interpreted cautiously, as aggregate performance data cannot isolate the underlying institutional or academic determinants.

Research has further shown that licensure examination performance occurs within a broader context of teacher preparation. Cadosales et al. (2023), in their investigation involving 2,680 beginning teachers from different regions of the Philippines, examined the relationship between licensure examination results and subsequent professional performance. Their findings emphasized the relevance of teacher preparation to licensure and professional outcomes and demonstrated that licensure examination components may provide useful information regarding beginning teachers' subsequent performance. This supports the importance of examining not only overall passing rates but also performance in specific examination components when assessing the licensure outcomes of teacher education graduates.

Researchers have also examined institutional support for licensure preparation. Colicol et al. (2022) evaluated a university-based LET Intensive Review Program using a transformative mixed-methods design. Their findings showed that elementary-level first-time examinees who participated in the review obtained significantly higher LET ratings than previous groups who had not undergone the same program. The study also identified educational background, motivation, financial circumstances, faculty support, and institutional processes as factors related to examination preparation and outcomes. These findings suggest that licensure performance may be linked to multiple learner and institutional conditions. However, conclusions about the effects of these factors require studies that measure them directly. Descriptive examination records alone cannot establish whether changes in passing rates resulted from curriculum revisions, review programs, instructional practices, faculty development, or other interventions.

Collectively, previous research establishes that institutional LET performance is a relevant outcome for teacher education programs and that longitudinal monitoring can provide valuable evidence about graduate performance (Bugwak, 2023; Navida, 2022). The literature also demonstrates that examination outcomes may be considered alongside teacher preparation and institutional support (Cadosales et al., 2023; Colicol et al., 2022). At the same time, these studies emphasize the importance of institution-specific evidence because the performance patterns identified in one TEI cannot automatically be generalized to another. Differences in student populations, examination periods, academic contexts, and institutional conditions may result in different licensure performance patterns.

In this context, Guimaras State University (GSU), as a higher education institution offering the Bachelor of Elementary Education program, has an interest in systematically examining its graduates' licensure examination performance. The available institutional records covered 10 BEEd graduates who took the September 2019 LET, September 2021 LET, October 2022 LEPT, and September 2023 LEPT. These records provide information on institutional passing performance and average ratings in General Education and Professional Education. Examining these data across multiple examination administrations and comparing institutional passing rates with corresponding national elementary-level rates provides a longitudinal, contextualized description of GSU BEEd graduates' licensure performance.

Although previous studies have investigated teacher licensure performance in other Philippine higher education institutions, the reviewed literature provides limited longitudinal evidence specifically describing the LET performance of BEEd graduates of Guimaras State University. Bugwak (2023) focused on BEEd graduates of Davao Oriental State University–San Isidro Campus, while Navida (2022) examined teacher education programs at Pangasinan State University–Alaminos City Campus. Colicol et al. (2022) evaluated a

university LET review program, whereas Cadosales et al. (2023) investigated relationships between licensure results and beginning teachers' professional performance. These studies provide important evidence on teacher licensure outcomes, but their findings are situated within their respective institutional and research contexts. Consequently, institution-specific evidence is necessary to establish the performance patterns of GSU BEd graduates.

To address this gap, the present study evaluated the LET/LEPT performance of Bachelor of Elementary Education (BEd) graduates from Guimaras State University. Specifically, it aimed to determine the institutional passing and failure rates of BEd graduates across the covered examination administrations, compare these results with corresponding national elementary-level passing rates, and analyze the graduates' average ratings in General Education and Professional Education across the covered examination years. As a descriptive investigation, the study does not establish the causes of observed performance patterns or attribute outcomes to interventions that were not directly measured.

METHODOLOGY

Research Design

This study employed a descriptive quantitative research design to examine the Licensure Examination for Teachers/Licensure Examination for Professional Teachers (LET/LEPT) performance of first-time Bachelor of Elementary Education (BEd) examinees from Guimaras State University (GSU). The design was appropriate because the study utilized existing institutional examination records to describe the number of examinees and passers, institutional passing rates, and average ratings in General Education and Professional Education across the examination administrations covered by the study. The study also compared institutional passing rates with the corresponding national elementary-level passing rates reported by the Professional Regulation Commission (PRC).

The analysis was descriptive and longitudinal because it examined examination outcomes across multiple LET/LEPT administrations from 2019 to 2023. However, the study did not attempt to establish causal relationships between licensure performance and curricular, instructional, review-related, or other institutional factors.

Data Source and Study Population

The study used secondary LET/LEPT performance records of first-time Bachelor of Elementary Education (BEd) examinees from Guimaras State University (GSU) across the examination administrations from 2019 to 2023. The study obtained institutional data from the university's existing LET/LEPT records and organized them by the specific examination administration in which graduates first took the licensure examination. The records included the number of first-time examinees, the number of passers, and available average ratings in General Education and Professional Education.

The dataset comprised 70 first-time GSU BEd examinees, consisting of 10 examinees in September 2019, six in September 2021, 18 in the October 2022 LEPT, 25 in the March 2023 LEPT, and 11 in the September 2023 LEPT. Of these, 59 passed the licensure examination. No GSU BEd first-time examinees were recorded for the March 2019 and March 2022 administrations. These examination administrations were nevertheless retained in the presentation of results to provide the chronological context of the national elementary-level LET/LEPT administrations and to explicitly indicate the absence of GSU first-time examinees during those periods. Repeat examinees were excluded from the institutional analysis to maintain consistency in describing the licensure performance of graduates taking the examination for the first time.

For comparison, national elementary-level passing rates were obtained from official examination results released by the Professional Regulation Commission (PRC). These national rates served as contextual benchmarks for assessing GSU's institutional passing performance relative to elementary-level examinees nationwide. Only examination administrations corresponding to the periods covered by the institutional records were included in the comparison. The September 2022 LEPT, originally scheduled for September 25, 2022, was officially rescheduled and administered on October 2, 2022; hence, it is presented in the study as the October 2022 LEPT.

Inclusion and Exclusion Criteria

The institutional analysis included BEEd graduates of Guimaras State University identified in available university records as first-time LET/LEPT examinees during the examination administrations covered by the study. For an examination administration to contribute to the GSU institutional passing rate, the records had to provide the number of first-time examinees and the corresponding number of passers.

The analysis excluded repeat examinees. Examination administrations in which GSU had no first-time BEEd examinees, specifically March 2019 and March 2022, were not included in the calculation of the overall GSU passing rate. These administrations were retained in Table 1 only to provide chronological context and corresponding national elementary-level performance.

Statistical Treatment of Data

Descriptive statistics were used to analyze the LET/LEPT performance records. Frequency and percentage were used to describe the number of GSU first-time examinees, number of passers, and institutional passing performance.

The institutional passing rate for each examination administration was calculated as:

$$\text{Passing Rate (\%)} = (\text{Number of Passers} / \text{Total Number of Examinees}) \times 100$$

The difference between the institutional and corresponding national passing rates was expressed in percentage points and calculated as:

$$\text{Percentage-Point Difference} = \text{GSU Passing Rate} - \text{National Passing Rate}$$

A positive value indicated that the GSU passing rate was higher than the corresponding national rate, while a negative value indicated that the institutional rate was lower.

Mean ratings described BEEd graduates' performance in General Education and Professional Education across the examination years covered by the study. Because the numbers of examinees differed across examination administrations, the mean across examination years was interpreted as an unweighted descriptive mean of the annual component ratings rather than as an overall mean for all 45 examinees.

Ethical Considerations

The study utilized secondary institutional records rather than collecting information directly from individual participants. The analysis used aggregate examination data, including numbers of examinees and passers, passing percentages, and average subject-area ratings. No personally identifiable information of individual graduates was included in the analysis or reporting of the findings.

RESULTS AND DISCUSSIONS

Passing and Failure Rates of BEEd Graduates in the LET

As shown in Table 1, the LET/LEPT performance of GSU BEEd first-time examinees varied across the examination administrations covered by the study. Of the 70 first-time examinees included in the institutional analysis, 59 passed, for an overall GSU passing rate of 84.29%. GSU exceeded the corresponding national elementary-level passing rate in four of the five examination administrations in which the university had first-time examinees.

In September 2019, seven of the 10 GSU first-time examinees passed the LET, yielding an institutional passing rate of 70.00%. This was 38.66 percentage points higher than the national elementary-level passing rate of 31.34%, with 28,973 of 92,440 examinees nationwide passing the examination (Professional Regulation Commission [PRC], 2019). Although the March 2019 national passing rate was 27.28%, no institutional comparison was made for that administration because GSU had no first-time BEEd examinees.

A different pattern was observed in September 2021. Three of the six GSU first-time examinees passed, resulting in an institutional passing rate of 50.00%. This was 5.96 percentage points below the corresponding national elementary-level passing rate of 55.96%, based on 4,883 passers among 8,726 examinees (PRC, 2021). This was the only examination administration with GSU first-time examinees in which the institutional passing rate was below the national benchmark.

No GSU first-time BEEd examinees were recorded for the March 2022 LET; consequently, the national passing rate of 48.81% is presented only for contextual purposes and was not used to calculate an institutional-national difference. PRC reported that 10,039 of 20,567 elementary-level examinees passed that administration (PRC, 2022).

GSU performance increased substantially in the October 2022 LEPT. Seventeen of the 18 first-time examinees passed, yielding an institutional passing rate of 94.44%. In comparison, the national elementary-level passing rate was 54.43%, based on 49,783 passers among 91,468 examinees. GSU therefore exceeded the national benchmark by 40.01 percentage points (PRC, 2022). This marked a substantial improvement from the institutional performance observed in September 2021.

The March 2023 LEPT represented the largest GSU cohort included in the study, with 25 first-time examinees. Of these, 21 passed, resulting in an institutional passing rate of 84.00%. Compared with the national elementary-level passing rate of approximately 40.76%, GSU performed about 43.24 percentage points above the national benchmark. Although the institutional rate was lower than that recorded in October 2022, it remained substantially higher than the corresponding national passing rate.

The strongest institutional outcome was recorded in September 2023, when all 11 GSU first-time examinees passed, producing a 100.00% passing rate. Nationally, 23,782 of 50,593 elementary-level examinees passed, equivalent to 47.01% (PRC, 2023). GSU therefore exceeded the national rate by 52.99 percentage points, the widest positive difference among the examination administrations included in the institutional comparison.

Taken together, the findings indicate that GSU's institutional performance fluctuated across examination administrations rather than following a continuous upward trend. The passing rate decreased from 70.00% in September 2019 to 50.00% in September 2021, increased to 94.44% in October 2022, declined moderately to 84.00% in March 2023, and reached 100.00% in September 2023. Thus, GSU demonstrated variable licensure performance, with particularly favorable outcomes in the 2022 and 2023 examination administrations.

Comparison with national performance provides additional context for these institutional results. GSU exceeded the corresponding national passing rate by 38.66 percentage points in September 2019, fell 5.96 percentage points below the national rate in September 2021, and subsequently exceeded the national benchmark by 40.01 percentage points in October 2022, approximately 43.24 percentage points in March 2023, and 52.99 percentage points in September 2023. Thus, GSU performed above the corresponding national elementary-level passing rate in four of the five examination administrations with first-time GSU examinees.

Using national passing rates as contextual benchmarks aligns with Bugwak (2023), who demonstrated that institutional licensure outcomes vary across examination periods when benchmarked against national trends. Such comparisons strengthen institutional analysis because a Teacher Education Institution's isolated passing percentage does not reveal how its graduates performed relative to the broader examinee population. Nevertheless, these results must be interpreted in light of the relatively small institutional cohort sizes. GSU's first-time examinees ranged from six in September 2021 to 25 in March 2023. Consequently, the outcome of just a few individuals can significantly distort the institutional percentage—a factor particularly relevant to the 100.00% passing rate in September 2023, which represents only 11 examinees. Institutional percentages should therefore be analyzed alongside raw frequency data rather than in isolation.

Accordingly, the comparatively high passing rates observed in the later examination administrations should not be attributed to curriculum revisions, review programs, instructional practices, or other institutional interventions without direct evidence. Colicó et al. (2022), for example, specifically examined an intensive LET review program using a mixed-methods design, allowing the researchers to evaluate the intervention itself. In contrast, the present study uses descriptive secondary records and therefore supports conclusions about patterns and comparisons, but not causal explanations.

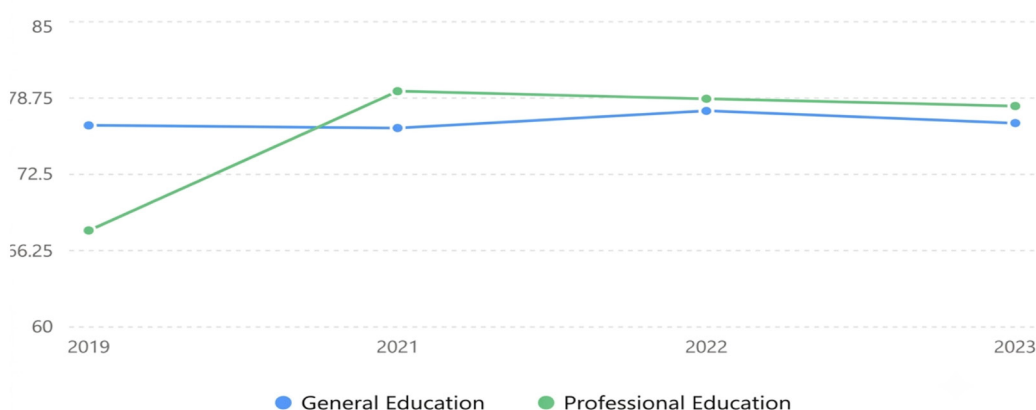
Overall, the findings for the first objective indicate that GSU BEEd first-time examinees demonstrated variable but generally favorable licensure performance relative to the national elementary-level benchmarks. The institutional passing rate exceeded the corresponding national rate in four of the five examination administrations with GSU first-time takers. These findings provide useful baseline evidence for continued monitoring but should be interpreted in light of cohort size, differences between institutional and national examinee populations, and the study's descriptive nature.

Table 1. LET/LEPT Performance of GSU BEEd First-Time Examinees Compared with the National Elementary-Level Passing Rate

Examination Year/ Administration	GSU First-Time Examinees	GSU Passers	GSU Non- Passers	GSU Passing Rate (%)	National Passing Rate (%)	Difference (Percentage Points)
March 2019 LET	No first-time takers	—	—	—	27.28	—
September 2019 LET	10	7	3	70.00	31.34	+38.66
September 2021 LET	6	3	3	50.00	55.96	-5.96
March 2022 LET	No first-time takers	—	—	—	48.81	—
October 2022 LEPT	18	17	1	94.44	54.43	+40.01
March 2023 LEPT	25	21	4	84.00	40.76	+43.24
September 2023 LEPT	11	11	0	100.00	47.01	+52.99

Trend in GSU BEEd LET/LEPT component ratings

Average General Education and Professional Education ratings across examination years.



Source: GSU institutional LET/LEPT records.

Figure 1. Trend in GSU BEEd LET/LEPT Passing Rates Compared with National Passing Rates, 2019–2023

Figure 1 shows the trend in the LET/LEPT passing rates of GSU BEEd first-time examinees relative to the corresponding national elementary-level passing rates. GSU performance fluctuated across the examination administrations but remained above the national benchmark in four of the five periods represented. The institutional rate exceeded the national rate in September 2019, fell below the national benchmark in September 2021, and then remained substantially higher in October 2022, March 2023, and September 2023. The widening positive differences in the later examination administrations indicate a favorable recent trajectory in GSU licensure performance relative to the national benchmark.

Average Ratings in General Education and Professional Education

As shown in Table 2, the average ratings of BEEd graduates varied across the General Education and Professional Education components during the examination years covered by the study. General Education ratings were relatively stable, ranging from 76.3 to 77.7, while Professional Education ratings varied more, ranging from 67.9 to 79.3.

In 2019, the graduates obtained an average rating of 76.5 in General Education and 67.9 in Professional Education. The 8.6-point difference indicates that General Education had the higher average rating during this examination year. The Professional Education rating of 67.9 was also the lowest component rating recorded across all examination years represented in Table 2.

The pattern changed in 2021. The average General Education rating was 76.3, while Professional Education rose to 79.3, creating a 3.0-point difference in favor of Professional Education. The Professional Education rating in 2021 was also the highest subject-area rating recorded during the study's examination years.

In 2022, the two component ratings were closer, with graduates obtaining 77.7 in General Education and 78.7 in Professional Education. The 1.0-point difference indicates relatively comparable performance between the two components. General Education also recorded its highest average rating in 2022.

A similar pattern was observed in 2023. Graduates obtained an average rating of 76.7 in General Education and 78.1 in Professional Education, a difference of 1.4 points in favor of Professional Education. Thus, Professional Education obtained higher average ratings than General Education in 2021, 2022, and 2023, while General Education had the higher rating in 2019.

Across the four examination years, the unweighted mean of the annual General Education ratings was 76.8, compared with 76.0 for Professional Education. However, interpret this difference cautiously because the lower Professional Education mean was substantially influenced by the 2019 rating of 67.9. Moreover, the number of examinees differed considerably across examination years. The annual means therefore provide a descriptive comparison of the examination periods and should not be treated as a weighted overall rating for all 70 graduates.

The findings show that GSU BEEd graduates' performance across the two LET components was not uniform over time. General Education performance remained comparatively stable across the four examination years, with only a 1.4-point difference between its lowest rating of 76.3 in 2021 and its highest rating of 77.7 in 2022. In contrast, Professional Education showed a wider range of 11.4 points, from 67.9 in 2019 to 79.3 in 2021. This indicates that the principal variation in subject-area performance occurred in Professional Education rather than General Education.

The results also correct the earlier interpretation that Professional Education consistently exceeded General Education. The data do not support such a conclusion because General Education recorded a substantially higher rating in 2019. A more accurate interpretation is that General Education showed relatively stable performance across examination years, while Professional Education improved markedly after the lower 2019 rating and subsequently exceeded General Education in 2021, 2022, and 2023.

Examining LET performance by component is important because overall passing rates alone may not reveal variations in the areas assessed by the licensure examination. Research on Philippine teacher licensure performance likewise recognizes the value of considering different examination components. In their investigation of beginning teachers in the Philippines, Cadosales et al. (2023) examined licensure performance in relation to teacher preparation and subsequent professional performance. Their findings showed that licensure examination components can provide relevant information concerning the preparation and professional performance of teacher education graduates. Thus, examining General Education and Professional Education separately provides a more detailed description of GSU graduates' licensure performance than relying exclusively on institutional passing percentages.

The relative stability of the General Education ratings suggests that the cohorts represented in the study maintained similar performance levels in this component across the examination years. By comparison, the considerable increase in Professional Education from 67.9 in 2019 to 79.3 in 2021, followed by ratings of 78.7 in 2022 and 78.1 in 2023, indicates that the lower performance observed in 2019 was not repeated

in the succeeding examination periods. However, because the study is descriptive, the data do not establish why this change occurred.

This caution is particularly important when relating examination outcomes to teacher preparation. Colicol et al. (2022) found that elementary-level first-time examinees who participated in an intensive LET review obtained significantly higher ratings than previous groups that had not undergone the program. Their study linked examination outcomes to the review intervention by evaluating the program through a mixed-methods design and statistical comparisons. In contrast, the present GSU study did not examine participation in review programs, curriculum changes, teaching strategies, academic achievement, or other possible explanatory factors. Therefore, based on the present data, the increase in Professional Education ratings after 2019 cannot be attributed to any particular institutional intervention.

The year-to-year variation is also consistent with the broader observation that teacher licensure performance may fluctuate across cohorts and examination periods. In examining BEEd graduates' licensure performance, Bugwak (2023) documented differences across examination periods and emphasized the value of systematic institutional monitoring of licensure outcomes. These studies support the present study's approach of examining the GSU results across several examination administrations.

When Table 2 is considered alongside the passing-rate results in Table 1, the findings show that component ratings and institutional passing rates varied across the examination periods. The institutional passing rate was 70.00% in September 2019, decreased to 50.00% in September 2021, increased to 94.44% in October 2022, reached 84.00% in March 2023, and increased to 100.00% in September 2023. General Education ratings remained relatively stable across the examination years, whereas Professional Education varied more, particularly between 2019 and the following years. Although the later examination periods generally showed favorable passing rates alongside higher Professional Education ratings than in 2019, this descriptive correspondence should not be interpreted as evidence of a causal relationship. Establishing whether component ratings or other factors are associated with passing outcomes would require individual-level data and appropriate inferential analysis.

Overall, the component-level findings indicate that General Education performance was relatively stable across examination years, whereas Professional Education demonstrated greater variation. These results provide useful baseline information for identifying areas that may warrant continued monitoring. However, because the study used aggregate examination records, the observed patterns cannot establish relationships between subject-area ratings and individual passing outcomes.

Future investigations may examine individual-level General Education and Professional Education scores together with academic performance, first-time or repeat-taker status, review-program participation, and other relevant variables. Such analyses would provide stronger evidence on the factors associated with differences in LET performance than the descriptive institutional records used in the present study.

Table 2. Licensure Examination for Teachers Average Ratings of BEEd Graduates of Guimaras State University

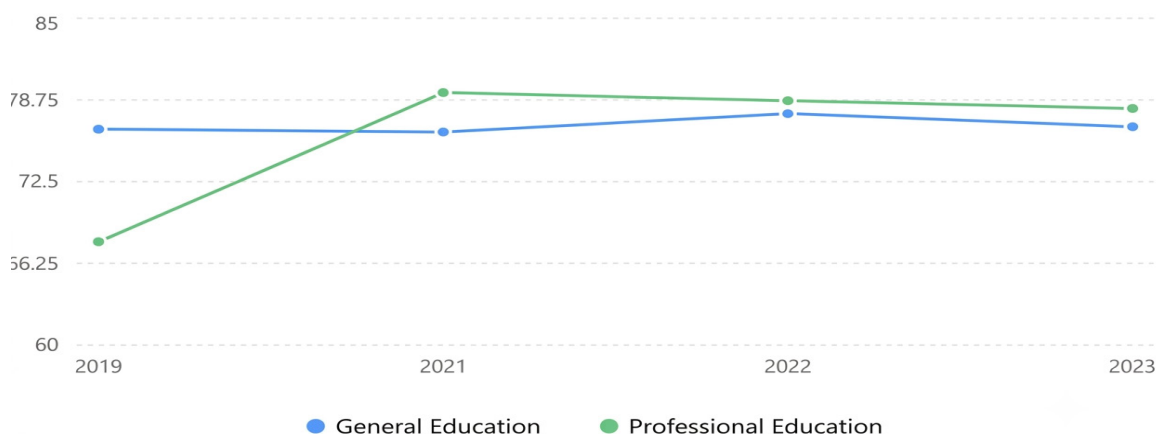
Year	General Education	Professional Education
2019	76.5	67.9
2021	76.3	79.3
2022	77.7	78.7
2023	76.7	78.1
Mean across examination years	76.8	76.0

Note. The mean across examination years is the unweighted arithmetic mean of the four annual component ratings. It should not be interpreted as the overall rating of all 213 examinees because the number of examinees differed across examination years.

To better visualize component-level performance, Figure 2 presents the trend in the average General Education and Professional Education ratings of GSU BEEd graduates across the examination years covered by the study.

Trend in GSU BEEd LET/LEPT component ratings

Average General Education and Professional Education ratings across examination years.



Source: GSU institutional LET/LEPT records.

Figure 2. trend in GSU BEEd LET/LEPT Component Ratings

Figure 2 shows different performance patterns in the two LET/LEPT components. General Education ratings remained relatively stable across the examination years, ranging from 76.3 to 77.7, with only minor fluctuations. In contrast, Professional Education varied more, increasing markedly from 67.9 in 2019 to 79.3 in 2021, then slightly decreasing to 78.7 in 2022 and 78.1 in 2023. Professional Education surpassed General Education from 2021 onward, although the difference between the two components narrowed in 2022 and 2023. Overall, the trend indicates sustained General Education performance and comparatively stronger Professional Education performance in the later examination years.

CONCLUSION

The study concludes that GSU BEEd first-time examinees' LET/LEPT performance was generally favorable relative to national benchmarks, although variations across examination administrations and components indicate the need for continued monitoring. General Education showed relatively stable performance, while Professional Education showed greater variation, highlighting areas for focused academic attention. The findings offer a positive basis for sustaining and further strengthening the university's teacher preparation efforts. GSU may enhance its data-driven monitoring of LET/LEPT performance, strengthen alignment between curriculum and licensure competencies, provide targeted mentoring and diagnostic support, and periodically evaluate review and academic support initiatives. These strategies are consistent with recommendations for strengthening teacher preparation and quality assurance in Philippine TEIs. With sustained monitoring and evidence-based academic support, the favorable performance of GSU BEEd graduates can serve as a foundation for achieving more consistent and sustainable licensure outcomes.

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Exploring the Career Trajectories of Bachelor of Elementary Education Graduates of Guimaras State University: A 2018–2023 Tracer Study

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Graduate tracer studies provide evidence for assessing the responsiveness of academic programs to graduates' employment outcomes and professional development. This study examined the career trajectories of Bachelor of Elementary Education (BEEd) graduates of Guimaras State University from 2018 to 2023 in terms of their demographic and professional profile, reasons for enrollment, employment characteristics, work-relevant competencies, perceived contribution of the BEEd program to competency development, and satisfaction with their university experience. Using a descriptive survey design and a total-enumeration approach, the study targeted all 214 identified graduates from the covered cohorts; 190 were successfully contacted, and 160 completed the adapted graduate tracer questionnaire. Data were analyzed using frequencies, percentages, means, and standard deviations. Results showed that 70.6% of the respondents were employed, and 59.3% of the employed graduates were engaged in teaching. All respondents identified technical and communication skills as relevant to employment, while research, information technology, critical-thinking, problem-solving, leadership, human-resource, and entrepreneurial skills were also reported as relevant. Graduates perceived the BEEd program as contributing very adequately to most professional competencies, with technical and communication skills receiving the highest means ($M = 4.22$), while entrepreneurial skills received the lowest but remained adequate ($M = 3.32$). Graduates also reported high overall satisfaction with university services, facilities, and the learning environment ($M = 4.21$). The findings indicate generally favorable employment, competency-development, and satisfaction outcomes while identifying entrepreneurial competency and university services as areas for closer institutional examination. The results provide graduate-based evidence that may inform curriculum review, graduate support, and continuing improvement of the BEEd program.

Keywords: *Bachelor of Elementary Education, career trajectories, graduate employability, graduate tracer study, teacher education, workplace competencies*

INTRODUCTION

Higher education institutions are increasingly expected to demonstrate that their academic programs remain responsive to changing professional requirements and labor-market conditions. One important indicator of this responsiveness is graduate employability, which extends beyond whether graduates obtain employment to include the relevance of their academic preparation, their transition to work, the competencies they use in the workplace, and their capacity to respond to evolving professional demands. For higher education institutions, information about graduates' employment experiences provides valuable evidence for evaluating academic programs and identifying areas that may require curricular or institutional improvement. Graduate tracer studies serve this purpose by systematically examining graduates after they complete their degrees and generating evidence on employment characteristics, transition to employment, competencies, and perceptions of their educational experiences (Gines, 2014).

Tracer studies are particularly useful because they connect academic preparation with graduates' experiences after leaving the university. In a tracer study of Philippine Normal University graduates, Gines (2014) demonstrated the value of examining employment characteristics, transition to employment, satisfaction with university services and facilities, and the skills and competencies developed during pre-service teacher education. This information allows institutions to evaluate whether academic programs remain adequate and relevant amid changing professional expectations. In this sense, tracer studies function not merely as records of graduate employment but also as mechanisms for institutional reflection, curriculum review, and quality improvement.

This evidence is especially important in teacher education. Teacher education programs are expected to prepare graduates not only with disciplinary and pedagogical knowledge but also with competencies that enable them to function effectively in changing educational and professional environments. Developments in technology, educational reform, and workplace expectations have increased the importance of transferable competencies alongside profession-specific knowledge. In a scoping review of 15 studies involving teacher

education graduates in the Philippines, Caingcoy (2021) identified communication, information and communication technology, problem-solving and critical thinking, collaboration and teamwork, research, and leadership among the major employability skills reported in the literature. These competencies provide a useful basis for examining whether teacher education graduates perceive their undergraduate preparation as responsive to the requirements they encounter after graduation.

Empirical tracer studies of teacher education graduates also highlight the importance of communication and other transferable competencies. In their study of graduates of Eastern Visayas State University-Tanauan Campus, Cornillez et al. (2021) examined employment characteristics, curriculum relevance, and the usefulness of competencies developed during university education. Their findings showed that most respondents were employed, generally held permanent or regular positions, and perceived their curriculum as relevant to employment. Communication, human relations, and self-assurance were among the competencies and values identified as useful in the workplace. These findings reinforce the importance of examining graduate outcomes beyond employment status alone because the relevance of academic preparation can also be reflected in the competencies graduates actually use in their professional roles.

Similarly, Pentang et al. (2022) examined teacher education graduates of Western Philippines University-Puerto Princesa Campus and showed how tracer-study findings can inform curriculum review and revision. Their study examined graduates' demographic and academic characteristics, employment, professional development, the relevance of their college preparation, and difficulties encountered in seeking employment. The graduates generally considered their college preparation relevant to their current employment, while the study identified areas that could inform future curriculum enhancement. These findings illustrate the institutional value of systematically connecting graduate experiences with program evaluation. Rather than relying solely on internal assessments of curriculum quality, higher education institutions can incorporate graduates' post-university experiences as an additional evidence source to determine whether program preparation remains responsive to workplace expectations.

Evidence focusing specifically on Bachelor of Elementary Education graduates further demonstrates the importance of program-level tracer studies. Apostol and Susada (2022), in their tracer study of 150 BEEd graduates of Davao Oriental State University-Cateel Extension Campus, found that most respondents were employed as regular or permanent basic education teachers, primarily in public or government institutions. Many obtained their first employment within one to six months after graduation and perceived their undergraduate curriculum as relevant to both their first and present employment. Graduates identified communication as one of the competencies they learned in college and found most useful in their employment. These findings demonstrate that employment status, job characteristics, curriculum relevance, and workplace competencies can collectively provide a more comprehensive understanding of how BEEd graduates transition from university preparation to professional practice.

Taken together, previous studies indicate that teacher education graduates' outcomes should be examined across several interconnected dimensions. Employment provides one indicator of graduates' transition into professional life, but employment status alone cannot fully describe the contribution or continuing relevance of an academic program. The nature of graduates' employment, the competencies they perceive as useful, the contribution of their academic preparation to skill development, and their retrospective assessment of their university experience provide complementary evidence. Caingcoy (2021) particularly emphasized the value of employability competencies as a framework for curriculum enhancement, while the tracer studies of Cornillez et al. (2021), Pentang et al. (2022), and Apostol and Susada (2022) demonstrate how graduate evidence can reveal both strengths and areas requiring further attention in teacher education programs.

For Guimaras State University (GSU), examining these outcomes is important to ensure the Bachelor of Elementary Education program remains responsive. Previous institutional tracer initiatives have generated information concerning graduates of teacher education and other academic programs. However, the available institutional evidence has not provided a sufficiently focused and updated account of BEEd graduates across the cohorts covered by the present investigation. A program-specific analysis is necessary because findings aggregated across different teacher education programs may obscure differences in graduates' employment experiences, professional competencies, and perceptions of their academic preparation. The absence of an updated BEEd-specific account therefore represents an institutional evidence gap concerning the employment characteristics, work-relevant competencies, perceived contribution of the program to competency development, and educational experiences of its graduates.

The study's conceptual framework was developed to organize the major dimensions examined in tracing BEEd graduates' professional experiences. It recognizes that graduates enter the workforce with educational experiences and competencies developed through the BEEd program, while their post-graduation outcomes may be described through their employment characteristics, work-relevant competencies, perceived contribution of the program to competency development, and satisfaction with their university experience. This framework aligns with tracer-study literature that emphasizes graduate employment, curriculum relevance, competencies, and educational experiences as evidence for program evaluation and improvement (Gines, 2014; Caingcoy, 2021; Pentang et al., 2022; Apostol & Susada, 2022).

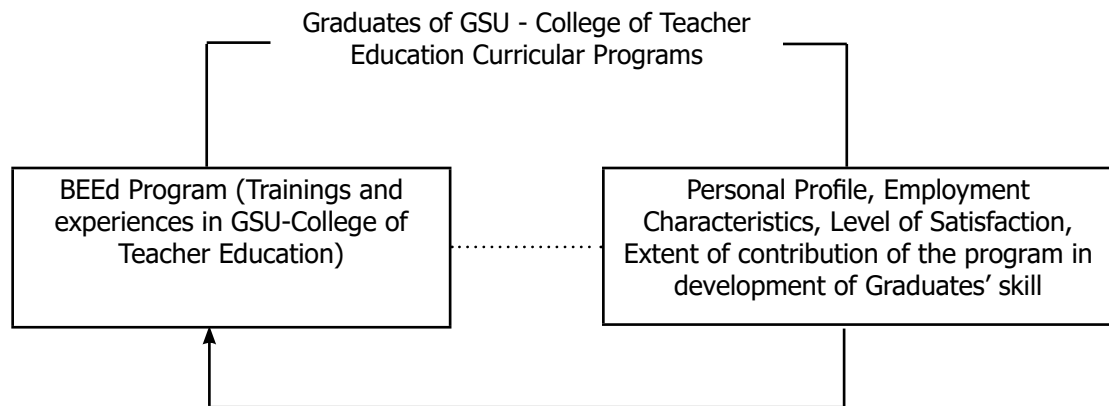


Figure 1: Conceptual Framework of the Study

Accordingly, this study examined the employment outcomes and professional experiences of Bachelor of Elementary Education graduates of Guimaras State University from 2018 to 2023. Specifically, it sought to describe the demographic and professional profile of the BEEd graduates and determine their reasons for enrolling at Guimaras State University; determine their employment characteristics and the competencies they perceived as relevant to their current employment; assess the extent to which the BEEd program contributed to the development of their professional competencies; and determine their level of satisfaction with university services, facilities, and the learning environment. By generating program-specific evidence on graduate outcomes and experiences, the study aims to provide an empirical basis for curriculum review, graduate support initiatives, and the continued improvement of the BEEd program.

METHODOLOGY

Research Design

This study employed a descriptive survey research design to examine the employment outcomes and professional experiences of Bachelor of Elementary Education (BEEd) graduates of Guimaras State University. Specifically, the study described the graduates' demographic and professional profile, employment characteristics and work-relevant competencies, perceived contribution of the BEEd program to competency development, and satisfaction level with university services, facilities, and the learning environment.

Respondents of the Study

The target population consisted of 214 BEEd graduates of Guimaras State University from the graduation cohorts covered by the study. Based on institutional graduate records, the researchers attempted to contact the identified graduates using the available contact information. Of the 214 identified graduates, 190 were successfully reached, and 160 completed the survey questionnaire.

No BEEd graduates were recorded in 2021; hence, the year was not represented in the study. This absence coincided with the effects of the national K to 12 transition, during which the implementation of Senior High School temporarily reduced the regular flow of students into higher education (CHED, 2015; DepEd, 2016).

Thus, the study obtained responses from 84.2% of the graduates who were successfully contacted (160/190). Relative to the total identified population of 214 graduates, the completed responses represented 74.8% of the identified graduate population.

Table 1. Distribution of BEEd Graduates and Survey Respondents by Graduation Year

Year of Graduation	Total Graduates	Graduates Reached	Graduates Who Responded	Response Percentage
2018	57	52	43	82.7
2019	46	41	35	85.4
2020	19	16	12	0.75
2022	40	37	31	83.8
2023	52	44	39	88.6
TOTAL	214	190	160	84.2

Sampling Procedure

The study employed a total enumeration approach, targeting all 214 BEEd graduates of Guimaras State University from the cohorts covered by the study. Of these, 190 were successfully contacted, and 160 voluntarily completed the survey and were included in the analysis. This yielded an 84.2% response rate among those contacted and represented 74.8% of the identified graduate population. The researchers did not select replacement participants for graduates who could not be reached or did not respond.

Research Instrument

The study used an adapted graduate tracer questionnaire to collect information aligned with the study objectives. As indicated in the original manuscript, the instrument was adapted from the Commission on Higher Education (CHED) Graduate Tracer Study questionnaire and informed by previous graduate tracer studies, including Gines (2014) and Magbanua et al. (2022). The researchers modified the questionnaire to fit the context of BEEd graduates of Guimaras State University and the variables examined in the study.

The instrument included items covering graduates' demographic and professional characteristics, employment characteristics, competencies perceived as relevant to employment, the BEEd program's perceived contribution to competency development, and satisfaction with university services, facilities, and the learning environment. The study used categorical items to obtain frequencies and percentages, while scaled items measured graduates' perceptions of program contribution and satisfaction.

Using a CHED-aligned graduate tracer instrument is appropriate for examining graduate outcomes in the Philippine higher education context. CHED has funded several national Graduate Tracer Studies and currently identifies its study conducted in coordination with the Philippine Institute for Development Studies as a reference containing the questions, criteria, and parameters for graduate tracer surveys.

Data-Gathering Procedure

The researchers first obtained the list and contact information of BEEd graduates in the cohorts covered by the study from appropriate university records. The researchers then contacted the identified graduates and invited them to participate in the tracer survey.

The researchers administered the questionnaire in online and printed formats to facilitate participation among graduates with different levels of accessibility. The researchers distributed the online questionnaire electronically and provided printed copies when necessary. Respondents were informed of the study's purpose and asked to answer the questionnaire based on their post-graduation and employment experiences.

Of the 214 graduates identified from university records, the team successfully reached 190. A total of 160 graduates returned completed questionnaires and were included in the analysis. The team reviewed completed responses for completeness, organized them, coded them, and prepared them for statistical analysis.

Data Analysis Procedure

The data analysis in this study follows a well-defined framework to interpret results, using structured scales ranging from 1.00 to 5.00. These scales provide a systematic method for evaluating graduates' responses

concerning their educational experiences and perceptions of the university's services and programs, offering a clear understanding of their satisfaction, adequacy, and relevance.

Within the study's "Retrospective Evaluation of the Program," the emphasis is on assessing graduates' satisfaction with university services, the learning environment, and available facilities. This aspect measures the effectiveness of the educational experience and how well it aligns with BEEd graduates' needs and expectations. The interpretation scales for satisfaction, adequacy, and relevance provide a quantitative framework for assessing graduates' contentment, the sufficiency of services, and the BEEd program's relevance to their skill development.

Incorporating frequency counts, percentages, means, and rankings in the data analysis ensures a comprehensive and statistically sound examination of graduates' responses. These analytical methods provide valuable insights into collective perceptions, helping identify patterns, trends, and areas for improvement.

Interpreting means using the defined scales ensures the findings are data-driven, user-friendly, and actionable. Aligning the means with the satisfaction, adequacy, and relevance scales allows the study to categorize and communicate graduates' satisfaction with university services and how well they perceive these services and programs to meet their needs. This systematic approach to data analysis enhances the validity and reliability of the study's findings, providing valuable insights for the university and its stakeholders to make informed decisions and improvements based on graduates' feedback.

Scale	Satisfaction	Adequacy	Relevance
1.00 – 1.50	Very Low Satisfaction	Not Adequate	Not Relevant
1.51 – 2.50	Low Satisfaction	Somewhat Adequate	Somewhat Relevant
2.51 – 3.50	Moderate Satisfaction	Adequate	Relevant
3.51 – 4.50	High Satisfaction	Very Adequate	Very Relevant
4.51 – 5.00	Very High Satisfaction	Extremely Adequate	Extremely Relevant

Ethical Considerations

The researchers observed ethical principles in conducting the graduate tracer survey. The researchers informed prospective respondents of the study's purpose and the voluntary nature of participation. The researchers obtained informed consent before participation and informed respondents that they could decline to participate or stop answering the questionnaire without penalty. The study treated respondents' information confidentially and used it solely for research purposes. The study excluded personally identifiable information from the presentation and reporting of results, and reported findings in aggregate form to protect respondents' identities.

RESULTS AND DISCUSSION

Personal Profile of the Respondents

Table 2 presents the demographic and professional profile of the 160 BEEd graduates. Most respondents were 21–30 years old (73.1%), followed by those aged 31–40 (19.4%) and 41–50 (7.6%), indicating that the majority were relatively young graduates. In terms of sex, 146 (91.2%) were female, while 14 (8.8%) were male. Most were single (66.2%), while 33.8% were married. Regarding educational attainment, 86.9% held a bachelor's degree as their highest qualification, whereas 13.1% had obtained a master's degree.

The graduates represented five graduation cohorts, with the largest proportion coming from 2018 (26.9%), followed by 2023 (24.4%, corrected based on 39/160), 2019 (21.9%), 2022 (19.4%), and 2020 (7.5%). The data included no 2021 cohort; as discussed in the Methodology, the manuscript should provide the verified institutional reason for its absence. In terms of professional development, 77 graduates (48.1%) had professional eligibility, 63 (39.4%) reported membership in professional organizations, and 58 (36.3%) had received awards or recognition.

The predominance of young, female, and single graduates is comparable with findings from other Philippine teacher-education tracer studies, particularly Apostol and Susada (2022), who similarly reported

that most BEEd graduates in their study were female and single. Thus, the demographic pattern observed among GSU graduates is comparable with evidence reported for another Philippine BEEd graduate population.

Professional eligibility is particularly relevant when interpreting the graduates' subsequent employment outcomes. Although 48.1% reported having eligibility, these descriptive data do not explain why the remaining graduates did not obtain eligibility or whether eligibility directly influenced their employment status. The result should therefore be treated as an important professional characteristic rather than as evidence of the effectiveness or inadequacy of the BEEd program. Likewise, membership in professional organizations and receipt of awards or recognition provide additional information about graduates' professional engagement, but the present study did not statistically examine their relationship with employment outcomes.

Overall, the profile provides important context for interpreting graduates' employment and professional experiences. The predominance of relatively young graduates and the presence of professional eligibility, organizational membership, and postgraduate qualifications among some respondents indicate varying levels of post-graduation professional development. Consider these characteristics alongside subsequent findings on employment and workplace competencies rather than interpreting them independently as indicators of program effectiveness.

Table 2. Demographic and Professional Profile of BEEd Graduates

Category	f	%
Entire Group	160	100.0
Age		
21 – 30 years old	117	73.1
31 – 40 years old	31	19.4
41 – 50 years old	12	7.5
Sex		
Male	14	8.8
Female	146	91.2
Civil Status		
Single	106	66.2
Married	54	33.8
Educational Attainment		
Bachelor's Degree	139	86.9
Master's Degree	21	13.1
Year Graduated		
2018	43	26.9
2019	35	21.9
2020	12	7.5
2022	31	19.4
2023	39	24.4
With Eligibility	77	48.1
Membership in Professional Organizations	63	39.4
Awards and Recognitions	58	36.3

Reasons for Enrolling at Guimaras State University

Table 3 presents the reasons graduates reported for enrolling at Guimaras State University. Since respondents could indicate more than one reason, the percentages represent multiple responses. All 160 respondents (100.0%) identified affordable tuition fees as the most frequently reported reason for enrollment. This was followed by professional development (90.6%), prospects for career advancement or promotion (88.1%), strong passion for immediate employment (86.3%), and peer influence (82.5%). These findings indicate that the graduates' enrollment decisions reflected a combination of financial, professional, employment-related, and social considerations.

The unanimous identification of affordable tuition suggests that financial accessibility was an important consideration in the respondents' decision to enroll at GSU. However, interpret this finding only as graduates' reported reason for enrollment, not as evidence that GSU was objectively more affordable than other higher education institutions, since the study did not compare tuition costs. Given the 100% response for this item, the researchers should also verify the result against the original questionnaires or dataset before final publication.

Professional and career-related considerations were likewise prominent. Professional development was reported by 90.6% of the graduates, while 88.1% identified prospects for career advancement or promotion. These findings are broadly consistent with the Fourth Philippine Graduate Tracer Study, which reported that Filipino graduates' choices of baccalaureate programs were influenced by anticipated earnings and opportunities for career advancement (Tutor et al., 2021). The present results therefore suggest that many GSU graduates associated their decision to pursue higher education with anticipated professional growth and future career opportunities.

Employment-related considerations were also evident, with 86.3% of respondents reporting a strong passion for immediate employment. Comparable teacher-education tracer research indicates that decisions to pursue teacher education may reflect both personal interest in the profession and anticipated employment opportunities. Pentang et al. (2022), for example, reported that 63% of the teacher-education graduates in their study identified a strong passion for the teaching profession as a reason for enrolling in the program. This finding shows that decisions to pursue teacher education may involve motivations beyond financial considerations, including professional interests and expectations associated with future employment. However, because the present GSU item is worded as "strong passion for immediate employment" rather than "strong passion for the teaching profession," direct equivalence between the two findings should not be assumed.

Peer influence was reported by 82.5% of the respondents, indicating that social considerations also contributed to their enrollment decisions. Previous teacher-education tracer literature has similarly documented the role of interpersonal influences in program selection, although these may involve parents, relatives, or other significant individuals rather than peers alone. In the present study, however, the findings should remain limited to peer influence, since the available data do not specify whether parents, relatives, teachers, or other individuals influenced the respondents' decisions.

Overall, the findings show that the graduates' reasons for enrolling at GSU were multidimensional, encompassing affordability, professional development, career advancement, employment expectations, and peer influence. The prominence of affordability highlights the importance respondents placed on financial accessibility, while the high frequencies for professional development and career advancement indicate that educational decisions were also associated with anticipated professional benefits. These findings provide useful context for understanding graduates' entry into the BEd program and complement the subsequent analysis of their employment characteristics and professional outcomes.

Table 3. Reasons of enrollment of the respondents.

Reasons	F (n=160)	%
Affordable Tuition Fee	160	100
Professional Development	145	90.1
Prospect for Career Advancement/Promotion	141	88.1
Strong Passion for Immediate Employment	138	86.3
Peer Influence	132	82.5

Employment Characteristics of the Graduates

Table 4 presents the employment characteristics of the 160 BEd graduates. Of the total respondents, 113 (70.6%) were currently employed, while 47 (29.4%) were not employed at the time of the survey. Among the 113 employed graduates, 67 (59.3%) were teaching, while 46 (40.7%) worked in non-teaching occupations. In addition, 98 graduates (61.3%) reported obtaining employment after graduation, while 47 (29.4%) were currently preparing for the Licensure Examination for Teachers (LET). Overall, the findings

indicate that a substantial proportion of graduates entered the workforce, with teaching as the predominant occupational destination among those currently employed.

The predominance of teaching employment is consistent with findings from comparable Philippine teacher-education tracer studies. Apostol and Susada (2022) found that most employed BEd graduates worked as basic education teachers, with the Department of Education as the principal employer; most currently employed respondents also worked in the education sector. Similarly, Pentang et al. (2022) reported favorable employability among teacher-education graduates and found that graduates generally perceived their college preparation as relevant to their current employment. These comparable findings suggest that entry into teaching remains an important employment pathway for teacher-education graduates.

Nevertheless, the finding that 46 of the 113 employed graduates (40.7%) were working in non-teaching occupations deserves attention. Employment outside teaching should not automatically be interpreted as job mismatch or as evidence of inadequate preparation. Comparable tracer evidence indicates that BEd graduates may also obtain employment in government agencies, private institutions, business organizations, and other occupational sectors outside basic education (Apostol & Susada, 2022). However, the present study did not examine the reasons for entering non-teaching occupations. Factors such as professional eligibility, the availability of teaching positions, individual career preferences, and other labor-market circumstances may be relevant, but the available data cannot establish these explanations. Further research examining job-degree alignment and the reasons underlying graduates' occupational choices would therefore provide a clearer understanding of their career transitions.

The finding that 98 graduates (61.3%) obtained employment after graduation provides further evidence of graduates' transition from higher education to the labor market. This is broadly comparable with Apostol and Susada (2022), whose BEd tracer study found that employed graduates commonly secured their first jobs within one to six months after completing college. Pentang et al. (2022) likewise reported that teacher-education graduates were generally employable and emphasized that tracer information on employment and the relevance of college preparation can provide useful evidence for curriculum review. However, because the present table does not report the time between graduation and first employment, no conclusion can be drawn about how quickly GSU graduates secured their first jobs.

Finally, 47 graduates (29.4%) were currently preparing for the LET. This finding provides additional context for interpreting the graduates' employment profile, particularly because professional eligibility may be relevant to entry into licensed teaching positions. Pentang et al. (2022) included licensure examination outcomes among the professional characteristics of teacher-education graduates and reported that many graduates had passed the Licensure Examination for Teachers. In the present study, however, LET preparation was not statistically examined in relation to employment status or type of employment. It should therefore be interpreted as a descriptive professional characteristic rather than a determinant of employment.

Taken together, the findings indicate that most GSU BEd graduates included in the study had entered employment, with teaching as the principal occupational pathway among those employed. At the same time, the substantial proportion working in non-teaching occupations and those preparing for the LET highlights variation in graduates' post-graduation trajectories. These findings provide a useful baseline for examining the competencies graduates perceive as relevant to their current employment.

Table 4. Employment Characteristics of the Respondents.

Employment Characteristic	F (n= 160)	%
Current Employment Status (n = 160)		
Employed	113	70.6
Not currently employed	47	29.4
Type of Employment (n = 113)		
Teaching	67	59.3
Non-teaching	46	40.7
Employment after Graduation		
Obtained employment after graduation	98	61.3
LET Preparation (n = 160)		
Currently reviewing for LET	47	29.4

Competencies Relevant to Current Employment

Table 5 presents the competencies that graduates perceived as relevant to their current employment. Based on the manuscript data, technical and communication skills emerged as the most frequently identified competencies, followed by problem-solving, research, critical-thinking, and leadership skills. The findings indicate that the competencies graduates considered relevant to employment encompass both profession-related abilities and transferable skills applicable across occupational settings.

These findings align with the Philippine teacher-education literature. In a scoping review of employability skills among teacher-education graduates in the Philippines, Caingcoy (2021) identified communication, information and communication technology, critical thinking and problem-solving, collaboration and teamwork, research, and leadership as recurring competencies associated with graduate employability. The author also recommended that teacher-education institutions examine how strongly they emphasize these competencies in their curricula. The competencies reported by GSU graduates therefore closely align with those identified in previous Philippine teacher-education studies.

Communication skills are particularly relevant to the present findings. Apostol and Susada (2022) reported that BEd graduates perceived communication skills as the most useful competency learned in college for employment. The prominence of communication in both studies highlights its applicability to professional roles that require interaction with learners, colleagues, administrators, parents, and other stakeholders.

Problem-solving, critical thinking, research, and leadership skills also emerged among the competencies GSU graduates perceived as relevant. Their identification supports the view that teacher preparation involves more than pedagogical and technical knowledge. Caingcoy (2021) similarly identified these transferable competencies as important dimensions of teacher-education graduate employability.

The comparatively lower frequencies reported for other competencies should not automatically be interpreted as curricular deficiencies. Their perceived relevance may vary with respondents' specific occupational responsibilities, particularly because 40.7% of the employed graduates were working outside teaching. Moreover, because the findings are based on graduates' perceptions rather than employer evaluations or direct competency assessments, they indicate perceived workplace relevance rather than objectively measured competency proficiency.

Table 5. Competencies relevant to Current Job.

Reasons	f	%
1. Technical Skills	160	100
2. Communication Skills	160	100
3. Leadership Skills	138	86.3
4. Problem Solving Skills	146	91.2
5. Critical Thinking Skills	142	88.8
6. Information Technology Skills	129	80.6
7. Research Skills	145	90.6
8. Human Resource Skills	114	71.2
9. Entrepreneurial Skills	98	61.3

Contribution of the BEd Program to Professional Competency Development

Table 6 presents the graduates' assessment of the extent to which the BEd program contributed to the development of their professional competencies. Based on the manuscript data, graduates generally perceived the program as contributing very adequately to the development of technical, communication, critical-thinking, leadership, problem-solving, research, human-resource, and information-technology skills. The results indicate a generally favorable perception of how their undergraduate preparation contributed to competencies relevant to professional practice.

These findings correspond with competencies identified in previous teacher-education tracer research. Caingcoy (2021) identified communication, ICT, critical thinking and problem-solving, research,

and leadership as recurring employability competencies among Philippine teacher-education graduates and proposed these competencies as a framework that institutions may consider in curriculum enhancement. Similarly, Apostol and Susada (2022) found that BEEd graduates perceived their undergraduate curriculum as relevant to their first and present employment and particularly emphasized communication as a useful competency developed during college.

The finding is also comparable with Pentang et al. (2022), whose teacher-education graduates generally considered their college preparation relevant to their current employment. Their study emphasized the value of tracer findings as baseline evidence for curriculum review and program strengthening. The present findings similarly provide GSU with graduate-based evidence concerning competencies perceived to have been supported by the BEEd program.

Among the competency areas, entrepreneurial skills obtained the lowest mean ($M = 3.32$). Importantly, according to the interpretation scale adopted in the manuscript, this mean falls within Adequate (2.51–3.50). The original interpretation of 3.32 as “Somewhat Adequate” should therefore be corrected in the table, narrative, abstract, conclusion, and recommendations.

Although entrepreneurial skills received the lowest rating, the result should not be interpreted as evidence of a deficiency in the program. Rather, its comparatively lower mean indicates an area that may warrant further examination during curriculum review, particularly in relation to contemporary opportunities for educational innovation, resource development, alternative employment, and entrepreneurial activities among education graduates. Since the present study did not investigate why entrepreneurial skills received a lower rating, no causal explanation should be advanced.

More importantly, the results reflect graduates' perceptions of the program's contribution, not direct assessments of their actual competency levels. Accordingly, the manuscript should state that graduates perceived the BEEd program as contributing to competency development, rather than claiming that the study demonstrated or proved the program's effectiveness.

Table 6. Extent of the program in Development of the Graduate's Skills.

Reasons	Mean	Sd	Description
1. Technical Skills	4.22	0.61	Very Adequate
2. Communication Skills	4.22	0.61	Very Adequate
3. Human Resource Skills	3.84	0.82	Very Adequate
4. Leadership Skills	4.08	0.76	Very Adequate
5. Problem Solving Skills	4.08	0.76	Very Adequate
6. Critical Thinking Skills	4.13	0.64	Very Adequate
7. Research Skills	3.94	0.79	Very Adequate
8. Information Technology Skills	3.84	0.82	Very Adequate
9. Entrepreneurial Skills	3.32	0.87	Adequate

Scale: 1.00-1.50 Not Adequate, 1.51-2.50 Somewhat Adequate, 2.51-3.50 Adequate, 3.51 – 4.50 Very Adequate, 4.51-5.00 Extremely Adequate

Satisfaction with University Services, Facilities, and the Learning Environment

Table 7 presents the graduates' level of satisfaction with university services, facilities, and the learning environment. Based on the manuscript data, respondents generally reported high satisfaction with their university experience. Among the individual indicators, respect for students received the highest mean, while university services received the lowest rating, though it remained within the high-satisfaction category. The results indicate that graduates generally held favorable perceptions of the institutional environment in which they completed their undergraduate education.

The satisfaction findings complement the employment and competency results by providing evidence concerning graduates' retrospective assessment of their educational experience. However, satisfaction should be distinguished from employment outcomes and competency development. A high satisfaction rating indicates a favorable perception of university experiences but does not establish that university services, facilities, or the learning environment directly caused graduates' subsequent employment outcomes.

Graduate feedback can nevertheless serve an important quality-improvement function. Apostol and Susada (2022), for example, reported that although BEEd graduates generally perceived their curriculum as relevant to employment, they identified the need for additional library and laboratory resources, equipment, facilities, and curricular options. Similarly, Pentang et al. (2022) emphasized that tracer-study findings can provide baseline evidence for curriculum review and recommendations for strengthening teacher-education programs. These studies demonstrate that favorable overall graduate perceptions can coexist with specific areas requiring institutional attention.

In the present study, the particularly favorable assessment of respect for students may reflect a perceived strength of the university's learning environment. Conversely, the comparatively lower rating for university services provides an area for closer institutional examination. Rather than recommending broad changes based solely on the overall satisfaction rating, GSU may examine the service indicators with the lowest means to identify specific areas where improvements may be warranted.

Overall, the findings suggest that the graduates viewed their university experience positively across services, facilities, and the learning environment. These satisfaction results should be considered complementary to, rather than explanatory of, the graduates' employment and competency outcomes. Together, the findings provide multiple sources of graduate-based evidence that may inform institutional planning, curriculum review, and improvement of student and graduate support mechanisms.

Table 7. Level of Satisfaction of the GSU Graduates to the BEEd Program

Category	Mean	Sd	Description
General Satisfaction	4.21	0.36	High Satisfaction
1. University Services	4.12	0.38	High Satisfaction
2. University Facilities	4.23	0.29	High Satisfaction
3. Learning Environment	4.28	0.52	High Satisfaction
3.1 Teaching Personnel	4.26	0.49	High Satisfaction
3.2 Instructional Materials	4.24	0.46	High Satisfaction
3.3 Respect to Students	4.34	0.49	High Satisfaction
3.4 Atmosphere of Political And Cultural Understanding	4.28	0.52	High Satisfaction

Scale: 1.00-1.50 Very Low Satisfaction, 1.51-2.50 Low Satisfaction, 2.51-3.50 Moderate Satisfaction, 3.51-4.50 High Satisfaction, 4.51-5.00 Very High Satisfaction

CONCLUSION

The study provides evidence that the career trajectories of GSU BEEd graduates extend across teaching and non-teaching employment and are supported by a range of professional and transferable competencies. Graduates generally perceived their undergraduate preparation and university experience favorably, suggesting that the BEEd program remains relevant to their professional development. At the same time, the findings identify areas that warrant continued attention, particularly entrepreneurial competency, professional eligibility, job-degree alignment, and university services. These findings may serve as a basis for curriculum review and the strengthening of graduate and institutional support mechanisms. Future tracer studies may incorporate employer perspectives and longitudinal data to provide a more comprehensive assessment of graduate outcomes and program relevance

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Utilization and Attitudes Toward Recycled and Reused Materials as Teaching Resources Among Student Demonstrators

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ABSTRACT Growing emphasis on sustainability in education has encouraged the integration of environmentally responsible practices into teaching and instructional-resource development. This study examined the utilization and perceptions of recycled and reused materials as instructional resources among Bachelor of Elementary Education (BEEd) student demonstrators. Specifically, it determined the types and frequency of materials used and described the participants' perceptions of their benefits and challenges. The study employed a descriptive qualitative design supplemented by descriptive quantitative data involving 27 second-year BEEd students. Data were obtained through direct observation of demonstration teaching and post-demonstration interviews. The study used frequencies and percentages to describe material utilization, while recorded interview responses were analyzed thematically. The findings showed substantial use of readily reusable post-consumer materials, particularly plastic-based resources. Participants perceived material reuse in terms of environmental responsibility, economic practicality, creativity and innovation, while also recognizing limitations related to preparation and teacher capability. The study highlights the potential of material reuse as a sustainability-oriented practice in teacher education while emphasizing that its instructional value depends on purposeful preparation and pedagogical application.

Keywords: *ducation for sustainable development, instructional resources, pre-service teachers, recycled materials, reused materials, teacher education*

INTRODUCTION

Growing concerns about resource consumption, solid-waste generation, and environmental sustainability have increased the need for educational institutions to examine how everyday teaching practices can support more responsible patterns of production and consumption. Schools and teacher-education institutions are particularly important settings for sustainability education because they influence not only learners' knowledge of environmental issues but also the practices, values, and behaviors that they may carry into their communities. Education for Sustainable Development (ESD) emphasizes developing the knowledge, skills, values, and attitudes that enable learners to make informed decisions and participate responsibly in creating a sustainable future (UNESCO, 2020). In this context, educational institutions have an important role in translating sustainability principles into concrete practices within the teaching and learning environment.

Teachers are central to this process because they can incorporate sustainability not only through curriculum content but also through instructional practices and the selection and use of learning resources. UNESCO (2020) emphasizes strengthening educators' capacities to employ transformative pedagogies and integrate sustainable development into teaching practice. This responsibility is particularly relevant in teacher education, where pre-service teachers develop the pedagogical knowledge, skills, and resourcefulness that they will eventually apply in actual classrooms. Reusing and transforming discarded materials into instructional resources offers a practical way to integrate sustainability into teaching while encouraging future teachers to consider the environmental implications of their instructional choices.

Using recycled and reused materials as teaching resources also creates opportunities to connect environmental responsibility with creativity and innovation. Recycling and upcycling activities have been linked to educational benefits beyond waste reduction. Flowers et al. (2018) demonstrated that educational experiences involving upcycling and product design could positively influence dimensions of students' environmental attitudes. Similarly, Neinhuis (2021) situated upcycling within design education as an approach for promoting circular-economy thinking and environmental awareness. Chatzopoulos et al. (2023) further demonstrated the potential of upcycled and recycled materials within sustainability-oriented STEM education, illustrating how discarded resources can be transformed and incorporated into authentic design and construction activities.

The educational value of these materials may also be linked to the creativity required to transform ordinary or discarded objects into purposeful teaching resources. Creative projects involving reusable materials require learners to plan, redesign, manipulate, and assign new functions to existing objects. Chystiakova (2022) emphasized the value of creative project work in teacher preparation, suggesting the relevance of

practical and creative activities in developing future teachers' professional competencies. In demonstration teaching, preparing instructional materials from available resources can similarly require student demonstrators to make decisions about design, instructional purpose, suitability, and application. Recycled and reused materials may therefore serve not only as inexpensive alternatives to commercially produced teaching aids but also as concrete resources for demonstrating sustainable practices and pedagogical creativity.

Despite these potential advantages, using recycled and reused materials does not automatically ensure instructional effectiveness. Their educational value depends on their relevance to intended learning outcomes, suitability for learners, safety, durability, preparation requirements, and the teacher's ability to transform available materials into meaningful instructional resources. Sustainability-oriented instructional practices may promote creativity, engagement, problem-solving, and environmental awareness; however, their implementation may also involve challenges related to preparation time, availability of appropriate materials, pedagogical skills, and institutional support. Thus, the environmental and economic value of recycled materials should be distinguished from their pedagogical effectiveness. A material may be environmentally sustainable and inexpensive but may have limited instructional value when it is not appropriately designed or aligned with the objectives of a lesson.

This issue is particularly important in pre-service teacher education because demonstration teaching gives future teachers opportunities to translate pedagogical principles into instructional decisions. During demonstration teaching, student teachers are expected to select and develop resources that present concepts, encourage learner participation, and support intended learning outcomes. The selection of recycled and reused materials therefore reflects not only resource availability but also the student demonstrators' ability to identify instructional possibilities in ordinary materials. Understanding which materials they use and how they perceive the advantages and limitations of these resources can provide insights into how sustainability and resourcefulness manifest during their professional preparation.

Although previous studies have examined recycling, upcycling, sustainability education, environmental attitudes, and the creative transformation of discarded materials (Chatzopoulos et al., 2023; Flowers et al., 2018; Neinhuis, 2021), limited attention has been given to the actual utilization of recycled and reused materials by pre-service elementary teachers during demonstration teaching. In particular, there remains a need to document the types of recycled and reused materials selected as instructional resources and to understand how student demonstrators perceive their environmental, economic, creative, and instructional benefits as well as the challenges associated with their preparation and use. Addressing this gap matters because pre-service teachers' experiences with instructional-resource development may influence how they later incorporate sustainable, resource-conscious practices into their teaching.

Constructivism provides a useful pedagogical lens for understanding the use of recycled and reused materials in demonstration teaching. From a constructivist perspective, knowledge and understanding develop through active experience, interaction, and reflection. Preparing instructional resources from discarded materials involves an active process in which student demonstrators identify available resources, assign new functions, redesign them for instructional purposes, and determine how to incorporate them into teaching activities. In this study, however, constructivism is not treated as a learning outcome to be measured. Instead, it serves as an interpretive perspective for understanding how the active transformation and application of available materials may support resourceful, experience-based teaching practices.

Conceptually, the study is situated within the demonstration teaching context, in which student demonstrators select and use recycled and reused instructional resources, resulting in two principal areas of examination: utilization patterns and perceived benefits and challenges. Utilization patterns refer to the types and frequency of recycled and reused materials employed during demonstration teaching, while perceived benefits and challenges refer to student demonstrators' views regarding the environmental, economic, creative, practical, and instructional implications of using such resources. This framework avoids assuming a causal effect of recycled materials on learning and instead focuses on documenting their actual utilization and the experiences and perceptions of the student demonstrators.

Figure 1. Conceptual Framework of the Study



Participants and Sampling

The participants were 27 second-year Bachelor of Elementary Education (BEEd) students who were undertaking demonstration teaching in the researcher's class. The study included the entire population of second-year BEEd students involved in the demonstration-teaching activity. The participants were included because their demonstration-teaching activities provided the specific context in which the utilization of recycled and reused instructional materials could be directly observed and documented.

As part of the demonstration-teaching activity, the student demonstrators prepared and used recycled and reused materials as instructional resources. Following their demonstrations, they were interviewed about the types of materials they used and their experiences and perceptions of the benefits and challenges of using these materials as instructional resources.

Prior to the collection of research data, approval was obtained from the participants for their involvement in the study and for the recording of their interview responses. The researcher explained the study's purpose and procedures before conducting the interviews and recording participants' responses.

Participation in the research component, including the video-recorded interviews, was voluntary and separate from the students' academic requirement to conduct demonstration teaching. Students' decisions to participate in the research component were independent of their grades and academic standing. This distinction was observed to minimize possible pressure arising from the researcher's concurrent role as their instructor.

The study therefore distinguished between the demonstration teaching as an academic activity and the collection and use of observation and interview data for research purposes. Only data from students who provided approval for their participation and for the use of their recorded responses were included in the research analysis.

Data Sources and Instruments

The study used direct observation and post-demonstration interviews as primary data sources. These data sources addressed the two objectives of the study: documenting the types and frequency of recycled and reused materials used during demonstration teaching and describing participants' perceptions of the benefits and challenges associated with their use as instructional resources.

For the first objective, the researcher obtained data through direct observation of the demonstration teaching sessions conducted by the 27 second-year BEEd student demonstrators. The researcher observed the instructional resources used during each demonstration and recorded the recycled and reused materials incorporated into the lessons. The researcher also prepared observational notes during the teaching demonstrations to document the materials actually used. These records served as the basis for identifying, classifying, and determining the frequency of use of the different recycled and reused materials.

For the second objective, post-demonstration interviews gathered participants' accounts of their experiences and perceptions of using recycled and reused instructional resources. Based on the questions documented in the original study, the interviews focused on two areas: (1) the recycled and reused materials utilized during demonstration teaching and (2) the participants' perceptions of using these materials as instructional resources. The interview questions were:

1. What recycled and reused materials did you use in your demonstration teaching?
2. What are your perceptions of the benefits and challenges of using recycled and reused materials as instructional resources in demonstration teaching?

The participants' interview responses were video-recorded, with their approval, to provide an accurate record and facilitate subsequent review and analysis. The recorded responses, along with the researcher's observational notes, formed the qualitative data used to identify recurring ideas about the environmental, economic, creative, practical, and instructional aspects of using recycled and reused materials.

Observation and interviews provided complementary sources of information. Observation documented which materials were actually used during the teaching demonstrations, while interviews provided information about how the student demonstrators perceived their use. Together, these sources enabled the study to describe both the utilization patterns and the perceived benefits and challenges associated with recycled and reused instructional resources.

Data Collection Procedure

Data were collected during the demonstration teaching activities of the 27 BEEd student participants. The researcher observed each demonstration without interfering and documented the recycled and reused materials used as instructional resources. After the demonstrations, the researcher interviewed participants about the materials they used and their experiences and perceptions of their use. With the participants' approval, interview responses were video-recorded to facilitate accurate documentation and subsequent analysis. The recordings and observational notes were then organized and reviewed for data analysis.

Data Analysis

Data were analyzed according to the study's two objectives. For the first objective, the recycled and reused materials observed during demonstration teaching were classified and tallied. Frequency and percentage distributions were used to describe their utilization

For the second objective, the recorded interview responses were analyzed thematically. The responses were reviewed to identify meaningful statements concerning participants' experiences and perceptions of recycled and reused instructional resources. Statements expressing similar ideas were grouped into categories, and recurring patterns were organized into four themes: (1) environmental responsibility through material reuse, (2) economic and practical value of reused materials, (3) creativity and innovation through repurposing, and (4) pedagogical value constrained by preparation and teacher capability.

The first theme encompassed perceptions related to reducing waste, protecting the environment, and giving discarded materials another useful purpose. The second reflected participants' views regarding cost savings, availability, convenience, and the practical use of materials found at home or in their surroundings. The third captured perceptions of creativity, innovation, discovery, and resourcefulness in transforming discarded objects into instructional resources. The fourth represented concerns regarding preparation difficulty, artistic or creative capability, and uncertainty about the direct instructional value of recycled and reused materials. Because individual responses could express more than one idea, statements were considered across relevant themes rather than being restricted to a single category. Participant codes (P1–P27) were used when presenting representative responses.

Trustworthiness of the Data

Credibility of the findings was supported by comparing information obtained from direct observation, observational notes, and recorded participant responses. The video recordings provided a documented source for reviewing participants' statements during analysis, while observational records documented the materials used during demonstration teaching. Comparing these sources helped establish consistency between the observed use of recycled and reused instructional resources and the participants' accounts of their experiences and perceptions.

Ethical Considerations

Approval was obtained from the participants before the collection and video recording of their responses. The purpose and procedures of the study were explained, and participation in the research component was voluntary and separate from the academic requirement to conduct demonstration teaching. Participation or non-participation did not affect the students' grades or academic standing. Participant identities were kept confidential in reporting the findings, with participant codes used when presenting representative statements. These measures were observed to minimize potential pressure arising from the researcher's concurrent role as instructor and researcher.

RESULTS AND DISCUSSION

Types and Frequency of Recycled and Reused Materials Used as Instructional Resources

Table 1 presents the types and frequency of recycled and reused materials utilized by the student demonstrators as instructional resources. Plastic bottles emerged as the most frequently used material, with 24 of the 27 participants (88.89%) incorporating them into their demonstration teaching. Drinking cans ranked second, with 20 participants (74.07%), while plastic water containers and plastic cups were each used by 15 participants (55.56%). Cartons were documented among 12 participants (44.44%), followed by drinking straws and glass/breakable bottles, each used by 11 participants (40.74%). Newspapers and brochures were each used by 10 participants (37.04%), while wood sticks were the least frequently utilized material, with five participants (18.52%).

The findings show that student demonstrators used a variety of readily reusable post-consumer materials to prepare instructional resources, with plastic-based materials appearing prominently among the most frequently documented categories. Plastic bottles, plastic water containers, plastic cups, and drinking straws were all incorporated into demonstration teaching.

The observed use of discarded materials as instructional resources aligns with sustainability-oriented educational practices that give existing materials new functions rather than discarding them immediately. Neinhuis (2021) emphasized the role of upcycling plastic waste in design education as a way to promote

environmental awareness and circular-economy thinking. Similarly, Chatzopoulos et al. (2023) demonstrated that recycled and upcycled materials can be incorporated into sustainability-oriented educational activities in which learners transform available resources into functional products. Although these studies were conducted in contexts different from elementary teacher preparation, they support the broader educational principle that discarded materials can be intentionally repurposed for learning-related activities.

The variety of materials documented in the present study also indicates that the student demonstrators did not depend on a single type of recycled resource. In addition to plastics and cans, paper-based materials such as newspapers, brochures, and cartons, as well as wood sticks and bottles, were incorporated into their teaching demonstrations. This reflects the practical application of material reuse within instructional-resource preparation. These practices align with Education for Sustainable Development, which encourages educators and educational institutions to translate sustainability principles into concrete educational practices (UNESCO, 2020).

The findings also relate to preparing future teachers. Demonstration teaching requires pre-service teachers to make instructional decisions about selecting, preparing, and applying learning resources. The documented use of recycled and reused materials shows that student demonstrators could incorporate discarded or previously used objects into this process. Chystiakova (2022) similarly emphasized creative project activities in teacher preparation, while Flowers et al. (2018) showed that educational experiences involving upcycling can shape environmental attitudes. Together, these studies suggest that engaging future teachers with reusable materials may provide opportunities to connect instructional-resource development with creativity and environmental responsibility.

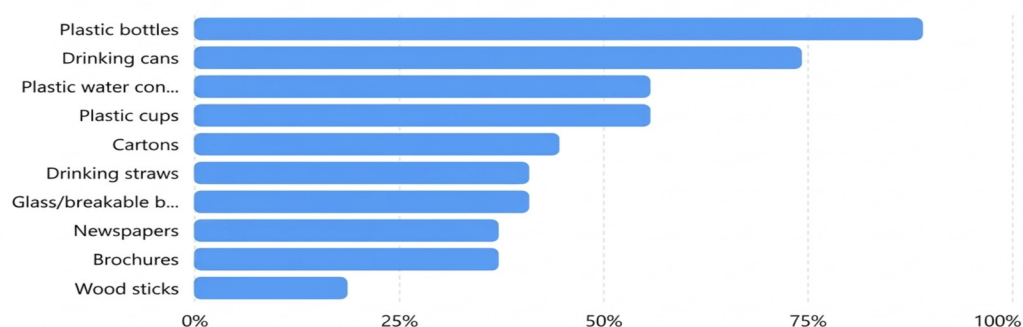
Table 1. Types and Frequency of Recycled and Reused Materials Used as Instructional Resources

Recycled/Reused Material	Frequency (n = 27)	Percentage (%)	Rank
Plastic bottles	24	88.89	1
Drinking cans	20	74.07	2
Plastic water containers	15	55.56	3.5
Plastic cups	15	55.56	3.5
Cartons	12	44.44	5
Drinking straws	11	40.74	6.5
Glass/breakable bottles	11	40.74	6.5
Newspapers	10	37.04	8.5
Brochures	10	37.04	8.5
Wood sticks	5	18.52	10

Note. Multiple materials could be used by each participant; therefore, the frequencies and percentages across categories do not total 27 and 100%, respectively. Percentages were calculated based on the 27 student demonstrators.

Utilization of recycled and reused instructional materials

Percentage of 27 BEd student demonstrators who used each material during demonstration teaching.



Multiple materials could be used by each participant; percentages therefore do not total 100%.

Figure 2. Utilization of Recycled and Reused Materials as Instructional Resources

Perceived Benefits and Challenges of Using Recycled and Reused Materials in Demonstration Teaching

The second objective described student demonstrators' perceptions of the benefits and challenges of using recycled and reused materials as instructional resources. Analysis of the participants' recorded responses revealed four recurring themes: (1) environmental responsibility through material reuse, (2) economic and practical value of reused materials, (3) creativity and innovation through repurposing, and (4) pedagogical value constrained by preparation and teacher capability. Table 2 summarizes these themes and representative participant statements.

Environmental Responsibility Through Material Reuse

Environmental responsibility emerged prominently in the participants' perceptions. Several student demonstrators linked recycled and reused materials to reducing garbage, protecting the environment, and extending the usefulness of materials that might otherwise be discarded. P1 described the practice as useful because it could "lessen the garbage in the environment," while P4 emphasized that students could learn to value things around them rather than simply discard used materials. Similar environmental concerns also appeared in responses from participants who described recycling and reuse as helping reduce waste in their surroundings.

These perceptions indicate that the student demonstrators recognized an environmental dimension in their choice of instructional resources. Their responses are consistent with the principles of Education for Sustainable Development, which emphasize developing knowledge, values, attitudes, and practices that enable learners to participate responsibly in creating a more sustainable future (UNESCO, 2020). In teacher education, incorporating material reuse into instructional-resource preparation may offer a practical way to connect environmental awareness with everyday teaching practices.

The findings are also consistent with Flowers et al. (2018), who found that educational experiences involving upcycling and product design could positively influence dimensions of environmental attitudes. Similarly, Neinhuis (2021) highlighted upcycling as an educational approach for promoting environmental awareness and circular-economy thinking. Although the present study did not measure changes in environmental attitudes, the participants' responses demonstrate that environmental responsibility was among the benefits they personally associated with using recycled and reused instructional resources.

Economic and Practical Value of Reused Materials

A second theme concerned the economic and practical value of recycled and reused resources. Several participants indicated that using available materials reduced the need to purchase new instructional resources. P22 explained that no money was spent because they collected and reused empty materials available at home, while other participants similarly mentioned saving money, availability, convenience, and usefulness.

The responses suggest that the student demonstrators viewed recycled and reused materials as practical alternatives to commercially purchased instructional resources. This consideration is particularly relevant to pre-service teachers who may need to prepare instructional materials using resources readily available within their immediate environment. Material reuse therefore provided not only an environmental function but also an economic one.

Creativity and Innovation Through Repurposing

Creativity and innovation constituted another recurring theme. Several participants described transforming recycled and reused materials into instructional resources as requiring creativity, discovery, and creating something new from existing objects. P11 referred to "creating another thing" from the materials, while P23 described the experience as helping one "to be creative and to be a discoverer." P20 also described preparing visual aids from recycled and reused materials as challenging but enjoyable.

These responses suggest that repurposing discarded materials gave student demonstrators opportunities to exercise resourcefulness in preparing instructional materials. Rather than using discarded objects in their original form, participants had to consider how to modify existing materials and assign them new instructional functions.

This finding aligns with Chystiakova (2022), who emphasized creative project activities in teacher preparation, and with Chatzopoulos et al. (2023), who showed how recycled and upcycled materials can be incorporated into sustainability-oriented design and construction activities. Neinhuis (2021) likewise associated upcycling with transforming waste into resources with new purposes. Collectively, these studies support the potential of material repurposing as an educational activity involving creativity and practical problem-solving.

From the constructivist perspective adopted in the study, this process may be understood as an active form of resource development in which student demonstrators interact with available materials, reconsider their original functions, and transform them according to an instructional purpose.

Pedagogical Value Constrained by Preparation and Teacher Capability

Despite the positive environmental, economic, and creative perceptions, participants also identified limitations. Some described preparing recycled instructional materials as difficult, while others questioned whether these resources necessarily produced substantial instructional benefits. P18 characterized their use as acceptable but “hard to prepare,” while P25 similarly recognized an environmental benefit but noted difficulty in preparing the materials. P16 indicated that usefulness depended on the individual's creativity, and P27 perceived little direct effect on teaching while acknowledging that the process encouraged teacher creativity.

These responses provide an important counterpoint to the predominantly positive perceptions. They indicate that the student demonstrators did not automatically equate using recycled materials with effective instruction. Instead, some participants perceived their instructional usefulness as dependent on the teacher's creativity, preparation, and ability to transform discarded objects into appropriate learning resources.

This distinction is important because environmental sustainability and pedagogical effectiveness are not necessarily equivalent. A material may be inexpensive, reusable, and environmentally beneficial but still require considerable preparation or may have limited instructional value if it is poorly aligned with the lesson objectives. Thus, select recycled and reused materials not simply because they are available or environmentally desirable, but because they can meaningfully support the intended teaching and learning process.

Overall, the findings revealed a balanced perception of recycled and reused materials as instructional resources among the student demonstrators. The participants primarily valued these materials for promoting environmental responsibility, economic practicality, and creativity and innovation, while also recognizing challenges related to preparation and teacher capability. These findings suggest that the value of recycled and reused materials extends beyond their environmental and economic benefits; their instructional usefulness depends on how appropriately they are selected, prepared, and integrated into the lesson. Thus, incorporating material reuse into pre-service teacher preparation may strengthen sustainability awareness and resourcefulness while developing the pedagogical judgment needed to transform available materials into meaningful instructional resources.

Table 2. Themes on the Perceived Benefits and Challenges of Using Recycled and Reused Instructional Resources

Theme	Description	Representative Participant Statement
Environmental Responsibility Through Material Reuse	Participants associated material reuse with reducing waste, protecting the environment, and giving discarded materials continued value.	“...lessen the garbage in the environment.” (P1)
Economic and Practical Value of Reused Materials	Participants viewed reused materials as economical, readily available alternatives to purchased instructional resources.	“I did not spend money to buy my materials...” (P22)
Creativity and Innovation Through Repurposing	Participants associated transforming discarded materials with creativity, discovery, innovation, and resourcefulness.	“...to be creative and to be a discoverer.” (P23)
Pedagogical Value Constrained by Preparation and Teacher Capability	Some participants reported difficulty preparing the materials and saw their instructional usefulness as depending on the teacher's creativity and skills.	“...it depends on how creative the individual is.” (P16)

Note. Participant codes (P1–P27) are used to maintain anonymity. Individual responses could reflect more than one theme; therefore, themes were not treated as mutually exclusive categories.

Limitations of the Study

While ethical precautions were taken to separate the research from course grading, the dual role of the researcher as the participants' instructor presents a potential limitation. Despite assurances of confidentiality and voluntary participation, student demonstrators may have been susceptible to social desirability bias, potentially overreporting positive attitudes or aligning their interview responses with perceived instructor expectations. Future research could mitigate this power dynamic by utilizing independent interviewers or examining pre-service teachers across multiple institutions.

CONCLUSION

The study underscores the potential of recycled and reused materials as practical resources for integrating sustainability into pre-service teacher preparation. Their value lies not simply in providing alternatives to commercially produced instructional materials but in creating opportunities for student demonstrators to connect environmental responsibility and resourcefulness with instructional practice. However, using recycled materials does not inherently ensure meaningful instruction. Their educational value depends on purposeful selection, appropriate preparation, and alignment with lesson objectives and learners' needs. Teacher-education programs may therefore consider strengthening opportunities for pre-service teachers to develop sustainable instructional resources while emphasizing pedagogical appropriateness, safety, functionality, and instructional purpose.

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Reframing Instructional Competence: A Phenomenological Study of Pupils' and Parents' Lived Experiences in Philippine Public Elementary Schools

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ABSTRACT This study explored instructional competence through the lived experiences of pupils and the perspectives of parents in a Philippine public elementary school and examined its implications for educational management. Using a qualitative phenomenological design, 20 participants comprising 10 pupils and 10 parents were purposively selected. Data were gathered through semi-structured interviews and focus group discussions and analyzed through an iterative thematic process. Findings revealed that instructional competence was experienced through relational competence, demonstrative and scaffolded teaching, and observable development in pupils' literacy and skills. Pupils valued teachers who were kind, supportive, and able to facilitate understanding, while parents associated effective teaching with caring relationships and visible improvements in their children's learning. However, pupils' accounts of punitive disciplinary practices revealed a tension between pedagogical effectiveness and ethical, child-centered teaching. Differences between pupils' experiences and parents' perceptions further demonstrated the value of multiple stakeholder perspectives in evaluating teacher competence. The study concludes that instructional competence encompasses pedagogical, relational, and ethical dimensions and underscores the importance of learner-centered supervision, positive discipline, child protection, and stakeholder participation in educational management.

Keywords: *instructional competence, phenomenology, teacher evaluation, qualitative research, philippines, child protection*

INTRODUCTION

The quality of teaching remains central to the effectiveness of educational systems because teachers influence not only what learners know but also how they engage with learning, interact with others, and develop confidence in their abilities. Contemporary conceptions of teacher competence therefore extend beyond subject-matter mastery and the delivery of prescribed content. Effective teaching integrates pedagogical knowledge, responsiveness to learner needs, appropriate assessment, supportive relationships, reflective practice, and the capacity to create learning environments in which pupils can participate meaningfully (Darling-Hammond & Oakes, 2021; Stronge, 2018). From this perspective, instructional competence is multidimensional: it encompasses what teachers know, how they facilitate learning, how they relate to learners, and how responsibly they exercise their professional authority.

Within the Philippine basic education system, this multidimensional understanding is reflected in the Philippine Professional Standards for Teachers (PPST). Adopted through Department of Education Order No. 42, s. 2017, the PPST defines teacher quality through interconnected domains covering 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 (Department of Education–Teacher Education Council, 2017). These standards indicate that competence cannot be confined to technical instructional performance. Teachers are also expected to respond to learner diversity, maintain supportive learning environments, communicate with families and communities, and continuously improve their professional practice. Instructional competence is consequently embedded within the broader responsibility of enabling learning while safeguarding learners' participation, dignity, and well-being.

The pedagogical dimension of competence is particularly important in elementary education, where teachers establish many foundational literacy and learning skills on which later academic development depends. Constructivist perspectives view learners as active participants who develop understanding through interaction, experience, and guided engagement rather than through passive reception of information (Piaget, 1964; Vygotsky, 1978). Within this perspective, competent instruction requires teachers to make learning accessible by connecting new ideas with learners' prior experiences, modeling processes, providing

appropriate guidance, and gradually supporting independent performance. Contemporary interpretations of constructivism similarly emphasize that effective learning requires appropriately guided instruction rather than leaving learners to construct understanding without sufficient pedagogical support (Taber, 2022).

These principles are particularly relevant to literacy instruction. Effective teachers make otherwise complex processes visible to learners by demonstrating strategies, explaining procedures, providing guided practice, and responding to difficulties as they emerge. Research on effective primary literacy instruction shows that teachers recognized for promoting literacy use varied, explicit instructional practices to support pupils' reading and writing development (Pressley et al., 1996). Teacher knowledge and instructional expertise are likewise important in translating knowledge about reading processes into classroom practices that develop reading proficiency (Lyon & Weiser, 2009). Instructional competence may therefore become meaningful to pupils and parents not through abstract professional standards but through concrete experiences such as understanding a lesson, learning to read or write, completing tasks successfully, and becoming increasingly independent as a learner.

Pedagogical competence, however, represents only one dimension of children's classroom experiences. Teaching is inherently relational because instruction occurs through sustained interactions between teachers and learners. Pupils encounter teachers not simply as sources of academic information but as adults whose communication, encouragement, responsiveness, fairness, and treatment of learners influence the classroom environment. Positive teacher–student relationships have been consistently associated with important educational outcomes. Roorda et al. (2023), in a meta-analytic examination of affective teacher–student relationships, found that positive relationships were associated with greater student engagement and achievement, whereas negative relationships were associated with less favorable outcomes. Subsequent research has continued to emphasize the importance of relational quality in supporting pupils' academic and socio-emotional experiences. Thus, instructional competence should be considered not only in terms of the teacher's ability to explain content but also in terms of the relational conditions through which pupils encounter that instruction.

A relational understanding of competence is particularly relevant for younger learners because feelings of trust, belonging, care, and psychological safety may shape their willingness to participate, ask questions, make mistakes, and persist when learning becomes difficult. Humanistic perspectives similarly position empathy, authenticity, and acceptance as important conditions for meaningful learning (Rogers, 1983). Teachers who combine instructional clarity with care and responsiveness may therefore create environments in which pupils are more willing to engage with academic tasks. In this sense, relational competence is not separate from instruction; rather, it can influence how learners receive, interpret, and respond to teaching.

The relational dimension of teaching also introduces an important ethical component. Professional competence involves not only the ability to produce desirable learning outcomes but also the responsibility to achieve those outcomes through practices that respect learners' rights and dignity. This consideration is especially important in classroom discipline. In the Philippines, the Department of Education's Child Protection Policy explicitly seeks to protect children from abuse, violence, exploitation, discrimination, bullying, and other forms of harm within schools and prohibits corporal punishment as a disciplinary practice (Department of Education, 2012). The policy establishes an important ethical boundary for teacher competence: instructional effectiveness cannot be separated from the responsibility to maintain a safe, child-centered learning environment.

The importance of this ethical dimension is reinforced by research on corporal punishment. Evidence indicates that physical punishment is linked to adverse developmental and psychosocial outcomes in children (Cuartas et al., 2021; Gershoff et al., 2023). This evidence challenges conceptions of competence that evaluate teachers primarily by academic performance while overlooking how learners experience discipline, authority, and interpersonal treatment. A teacher may demonstrate content knowledge and effective instructional techniques, but practices that cause fear, humiliation, or physical harm can undermine the supportive conditions necessary for meaningful participation and learning. Instructional competence must therefore encompass pedagogical, relational, and ethical dimensions rather than treating classroom management and child protection as concerns separate from teaching quality.

Reflective practice further strengthens this multidimensional conception of competence. Teachers operate in complex classroom environments in which learner needs, behaviors, abilities, and circumstances continually change. Consequently, competent teaching requires the capacity to examine one's instructional

and relational practices and make appropriate adjustments. Reflective teaching enables educators to critically consider the consequences of their decisions and improve practice in response to learners and classroom circumstances (Zeichner & Liston, 2014). Reflection is especially relevant when teachers consider whether established disciplinary or instructional practices remain consistent with learner-centered pedagogy, professional standards, and child-protection principles. From this perspective, competence is not a fixed attribute teachers possess but an evolving professional capacity shaped by experience, feedback, ethical judgment, and continuing professional learning.

Despite the multidimensional nature of instructional competence, its evaluation has often emphasized professional standards, teacher self-assessment, administrative observation, or measurable student outcomes. Philippine studies have likewise examined teachers' professional and instructional competencies using indicators derived primarily from professional expectations and teacher performance (Gepila, 2020; Talahiban et al., 2022). Such approaches provide valuable information about whether teachers demonstrate expected knowledge and practices; however, they may not fully capture how those practices are experienced by the people most directly affected. Evaluating competence exclusively from the perspective of teachers or administrators may therefore leave important aspects of everyday classroom experience insufficiently understood.

Pupils represent a particularly important yet comparatively underutilized source of evidence about instructional competence. They directly experience teachers' explanations, learning activities, feedback, classroom management, interpersonal behavior, and disciplinary practices. Their accounts can illuminate aspects of teaching that may not be visible during scheduled classroom observations or fully captured by formal evaluation instruments. From a phenomenological standpoint, these experiences matter because competence is not merely a set of externally prescribed behaviors but something encountered and given meaning through everyday interactions. Phenomenological inquiry is particularly appropriate when the purpose is to understand how individuals experience and interpret a phenomenon within the contexts in which it occurs (van Manen, 2014; Neubauer et al., 2019).

Parents provide a complementary perspective. Although parents may not directly observe routine classroom instruction, they encounter its perceived effects through their children's academic development, attitudes toward schooling, accounts of classroom experiences, and interactions with teachers. Parents may interpret teaching competence through observable changes in reading, writing, confidence, motivation, behavior, or school participation. Their perspectives can therefore offer insight into how instructional competence is understood beyond the classroom and how families judge teacher effectiveness. At the same time, parental perceptions should not be assumed to reproduce children's experiences. Differences between pupils' and parents' perspectives may also provide important information about how educational stakeholders observe, interpret, and understand teaching and classroom relationships differently.

Bringing these perspectives together is particularly important for educational management. School heads are responsible not only for monitoring instructional performance but also for cultivating safe learning environments, supporting teachers' professional development, implementing national policies, engaging families, and promoting continuous school improvement. The PPST itself recognizes that quality teaching involves relationships among instruction, learning environments, community engagement, and professional development (Department of Education–Teacher Education Council, 2017). Understanding how pupils and parents experience instructional competence may therefore provide school leaders with evidence that complements conventional supervisory mechanisms. Stakeholder perspectives may reveal instructional strengths requiring reinforcement, relational practices that support learning, and ethical or classroom-management concerns that require professional or administrative attention.

Although instructional competence has been widely studied, a significant gap remains in understanding how pupils' lived experiences and parents' perspectives shape it within Philippine public elementary schools. Much of the available literature conceptualizes teacher competence from professional, institutional, or performance-based perspectives, while comparatively less attention has been given to how stakeholders who directly experience or observe its everyday consequences understand competence. Moreover, pedagogical effectiveness, relational quality, learner development, and ethical classroom practice are frequently examined as separate concerns rather than as interconnected dimensions through which stakeholders may interpret competent teaching. This gap matters particularly in elementary education, where pupils' dependence on teachers for both academic guidance and classroom care makes instructional and interpersonal experiences inseparable.

Addressing this gap requires an approach that keeps participants' experiences and meanings central to the analysis. Rather than assuming predetermined indicators adequately represent instructional competence, a phenomenological inquiry offers an opportunity to examine how competence is experienced, recognized, negotiated, and interpreted in everyday schooling. Listening to pupils alongside parents can further reveal areas of convergence and divergence between direct classroom experience and family perceptions. Such evidence can broaden prevailing understandings of teacher quality and provide school leaders with a more stakeholder-informed basis for instructional supervision, professional development, child protection, and school improvement.

Against this background, this phenomenological study explored instructional competence through the lived experiences of pupils and the perspectives of parents in a Philippine public elementary school. Specifically, the study aimed to describe how pupils and parents perceive and experience teachers' instructional competence and to determine the implications of these experiences for educational management and school leadership. By examining instructional competence through pedagogical, relational, and ethical lenses, the study seeks to contribute a context-sensitive understanding of teacher quality that recognizes not only what teachers enable pupils to learn but also how learners experience teaching and how families interpret it.

METHODOLOGY

Research Design

This study employed a qualitative phenomenological design to explore how pupils and parents experience and interpret teachers' instructional competence in a Philippine public elementary school. Phenomenology was appropriate because the study focused on participants' lived experiences and the meanings they attributed to teaching practices, relationships, and learning experiences (van Manen, 2014; Neubauer et al., 2019).

Participants and Sampling

Purposive sampling was used to select 20 information-rich participants comprising 10 pupils and 10 parents (Creswell & Poth, 2018). The pupils were aged 9–12 years and had sufficient school experience to describe their interactions with teachers. Parents were primary caregivers of pupils enrolled in the same school and provided complementary perspectives on their children's educational experiences and development. We determined participant adequacy by the richness, relevance, and recurrence of information across accounts rather than by statistical representativeness.

Data Collection

Data were gathered through semi-structured interviews and focus group discussions (FGDs) to capture both individual and shared perspectives on instructional competence. Interviews began with broad questions before proceeding to participants' experiences of teaching practices, classroom relationships, learning, and teacher competence. Sessions were conducted in safe and convenient locations, audio-recorded with informed consent, and supplemented with notes on relevant non-verbal cues. Participants were allowed to communicate in English or the local language to facilitate comfortable and authentic expression of their experiences. The use of these complementary methods generated rich descriptions that captured the depth and complexity of participants' lived experiences (Bryman, 2008).

Data Analysis

Data were analyzed through an iterative thematic process consistent with the study's phenomenological purpose. Audio recordings were transcribed and repeatedly reviewed for familiarization. The analysis identified significant statements and meaning units related to instructional competence, then coded, compared, and clustered them into recurring themes. The analysis examined pupil and parent accounts for both convergence and divergence. Theoretical perspectives served as sensitizing concepts during interpretation rather than predetermined categories, keeping the themes grounded in participants' experiences.

Trustworthiness

Trustworthiness was established using Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability. Credibility was supported through member checking and comparison of interview and focus group accounts. Transferability was addressed through contextual descriptions of the participants and setting, while dependability was supported by documentation of data collection and analytical procedures. Confirmability was strengthened through reflective journaling and peer debriefing to minimize the influence of researcher assumptions.

Ethical Considerations

Permission to conduct the study was obtained from the Schools Division Superintendent and school principal. Adult participants provided informed consent, while parental consent and child assent were secured for pupil participants. Participation was voluntary, and participants were informed of their right to withdraw. Confidentiality was protected through anonymized participant codes and secure storage of research records. Particular sensitivity was observed when pupils discussed disciplinary experiences to protect their privacy, dignity, and welfare.

Reflexivity and Positionality

The researchers acknowledged that their backgrounds as educators could influence data collection and interpretation (Berger, 2015). Reflective journaling and peer debriefing were therefore used to examine assumptions and emerging interpretations. Language flexibility and rapport-building were also employed to ensure that participants' perspectives remained central to the analysis.

RESULTS AND DISCUSSION

In this section, the major themes drawn from interviews with selected students are presented. Subsequently, these were confirmed by their parents' information in the focus group discussion.

Theme 1: Relational Competence as Core to Teaching

Maau siya mutudlo kay kasabot ko. Ganahan ko sa akong teacher. (My teacher is good in teaching, because I easily learn from her. So, I like my teacher.) - S1

Happy ko sapag-eskwela kay makabalo ko mubasa. Maayo si teacher nako sa pagtudlo kay makabasa na ko ug makasulat. Pero, naa langkoy dili mauyunan. Nagapangusi ang teacher nako. (I am happy with my studies because I have learned how to read. My teacher is good, for she teaches me how to read and write. However, there is one thing that I dislike about my teacher. She is inclined to pinch.) - S2

Ok man akong maestra kay gipasulat mi. Pero, naa koy dili nauyunan kay nagapamalo siya. (My teacher is OK, for she engages us in writing. However, what I do not like in her is that she tends to spank us.)- S3

Naganahan ko sa akong teacher kay buutan siya. Makasabot kosa pagtudlo niya kay naminaw ko niya. (I like my teacher because she is kind. When she teaches, I listen. So, it makes me easily understand the way she teaches.) -S4

This theme highlights that students' perceptions of instructional competence are neither uniform nor simplistic, but rather shaped by a range of experiences with different teachers, subjects, and classroom contexts. The variation in their responses reflects how competence is relationally and situationally defined—what counts as "good teaching" for one student may be grounded in interpersonal warmth, while for another it is rooted in concrete skill-building. These perspectives are inseparable from the broader socio-educational realities of Philippine public schools, where large class sizes, resource limitations, and the curriculum's strong emphasis on literacy condition how teaching is practiced and perceived.

Students' accounts suggest that instructional competence is understood through three interwoven dimensions: affective (teachers' kindness inspires participation), cognitive (teachers' instruction in reading and writing is recognized as essential), and practical (writing activities provide opportunities for application

and mastery). Collectively, these reveal that for learners, competence is not confined to technique alone; it emerges at the intersection of pedagogy, care, and context. In this sense, students position their teachers' effectiveness not as an abstract standard but as a lived reality that fosters motivation, literacy development, and meaningful engagement, as inferred from their testimonies.

This perspective resonates with Rogers' (1983) humanistic view of teaching as an act of empathy and authenticity that fosters learner confidence and holistic growth. Similarly, Vygotsky's (1978) constructivist framework underscores the social dimension of learning, where positive relationships with more knowledgeable others are central to developing both cognitive and affective capacities. Recent studies affirm that relational competence—teachers' ability to establish trust, empathy, and care—significantly predicts students' academic engagement and motivation (Federici & Vangrieken, 2020; Roorda et al., 2023).

Theme 2: Tension Between Effective Teaching and Corporal Punishment

"Ok man akong maestra kay gipasulat mi. Pero, naa koy dili nauyunan kay nagapamalo siya. (My teacher is OK, for she engages us in writing. However, what I do not like in her is that she tends to spank us.) -S3

"Happy ko sapag eskwela ko ka makabalo ko mubasa. Maayo si teacher nako sa pagtudlo kay makabasa na ko ug makasulat. Pero, naa lang koy dili mauyunan. Nagapangusi ang teacher nako." ("I am happy with my studies because I have learned how to read. My teacher is good, for she teaches me how to read and write. However, there is one thing which I do not like about my teacher. She is inclined to pinch.")-S2

In the student interviews, a complex theme surfaced: while learners recognized their teachers as "good in teaching," this acknowledgment was tempered by accounts of corporal punishment, such as being pinched or spanked. This contradiction reveals how instructional competence is entangled with disciplinary practices. On the one hand, students valued their teachers' ability to facilitate learning; on the other, the persistence of punitive methods introduced tension into their perceptions. Rather than dismissing these experiences, students seemed to negotiate them—holding on to respect for their teachers' academic guidance while simultaneously disclosing practices that undermined the humane and supportive climate they otherwise desired. This suggests that in their lived experience, "good teaching" can coexist with problematic discipline, reflecting broader cultural norms of authority in classrooms and the lingering acceptance of corporal punishment in some educational settings, as inferred from their statements.

The consequences of such practices are well-documented. Corporal punishment has been linked to aggression, increased bullying, and poor psychological adjustment among learners (Zolotor et al., 2010; Cuartas et al., 2021). At the global level, the World Health Organization (2023) has categorized corporal as a public health concern due to its adverse effects on children's mental health, cognitive development, and social functioning. More recent evidence shows that exposure to violent discipline predicts lower academic performance and reduced classroom participation (Gershoff et al., 2023). In this light, while relational competence is celebrated as a transformative quality of teachers, corporal punishment represents a regressive force that erodes students' trust and diminishes the positive relational climate necessary for learning.

Theme 3: Demonstrative and Scaffolded Teaching

"Ginapakita nila ang ways arun makatuon ang mga bata. Example, sa pag-pronounce, gitudluan sa mga teachers kung paano mag pronounce o pag basa. Akong kamagulangan nga anak, hawud pud honor siya sapag graduate, pag abot niya sa Tadeco, hawud na siya." ("They show the ways so that their students can easily learn. For example, in pronunciation, the teachers teach their students how to pronounce words well or read. When my eldest son finished his education here with honors, he was really good in reading. So, when he studied in Tadeco, he maintained his academic honors.")- P3

In the focus group discussion, parents built on their children's testimonies, and from their collective reflections, the theme of Demonstrative Teaching emerged. This theme points to the affirmation of the parents that their children's progress in reading and writing is attributed to the pedagogical strategies employed by teachers. One parent illustrated how the demonstration method became more than a technique—it was a bridge between abstract knowledge and tangible learning. She stated that by modeling pronunciation and showing learners how to decode words, teachers transformed reading from a mechanical exercise into a step-by-step, accessible process. This parental observation suggests that instructional competence lies in the

ability to make learning visible and replicable, enabling children to internalize skills through guided practice. In this light, the demonstration method is interpreted not merely as a tool but as an empowering approach that scaffolds learners' confidence and independence, as inferred from her extracted testimony.

Several studies trace a link between teacher knowledge/instructional expertise and student reading outcomes. When teachers demonstrate, articulate, and scaffold, they translate complex knowledge about phonics, decoding, and comprehension into concrete classroom practices that students can observe, imitate, and internalize (Pressley et al., 1996; Lyon & Weiser, 2009; Ellis & Moss, 2013; Englert et al., 2019).

Theme 4. Good Human Relationships with Students

"Sweto nako sa the way sila mu care sa mga bata. Dili nila gina isipna laing tao ang mga bata. Gina-treat akita murag kadugo nila ang mga bata. Dili pud sila pabaya sa mga bata. Panatag ko sa mga pamaagi nila. Gani ang ginikanan, relaks lang ko." ("I am familiar with the way the teachers teach our children. They do not consider our children as strangers to them. They treat them like their relatives. They do care for our children. I am fully at ease with their ways, so as a parent, I feel relaxed.") – P2

"Ang mga maestra sa Tibungol nagatudlo maau sa mga bata. Wala nila ginapaagi sapag bunal kay bawal naman na. Ila jud na ginapakitasa mga bata ang pamaagi arun makabalo pud ang mga bata." ("The teachers in Tibungol teach well the children. They do not use corporal punishment, for it is restricted by law. They rather show the way for their children to learn.") – P3

A striking tension emerged when comparing the testimonies of students with those of their parents. While some children recounted experiences of corporal punishment, parents in the focus group discussion highlighted the contrasting theme of Good Human Relationships with Students. Their emphasis on kindness and care framed effective teaching as inseparable from the relational and ethical stance teachers adopt. For them, competence was not measured solely by instructional strategies, but by the ability of teachers to embody patience, warmth, and respect in their interactions.

This divergence between student and parent perspectives is revealing. On the one hand, it exposes how children's lived realities of discipline may conflict with parents' idealized or generalized views of teachers as "second parents." On the other hand, it underscores how both groups situate competence within the realm of human relationships, whether as an aspiration (parents' view of care and nurturance) or as a site of struggle (students' accounts of fear and punishment). The parents' insistence on a child-friendly, punishment-free classroom reveals an implicit critique of practices that undermine humane teaching. Thus, the tension itself becomes an interpretive lens: it demonstrates that instructional competence is negotiated not only through pedagogical ability, but also through the alignment—or misalignment—between relational ideals and disciplinary realities in the classroom.

Based on research studies, student narratives that foreground fear or punitive discipline illuminate the counterpoint: disciplinary realities can impede learning when fear inhibits risk-taking, inquiry, and engagement. This aligns with literatures on social-emotional learning and the detriments of high-punitive approaches for marginalized students, reinforcing that effective literacy and disciplinary practices must cohere with relational warmth and autonomy-supportive environments (Bailey et al., 2019; Marshall, n.d.; Stewart et al., 2021). The parental stance represents an interpretive lens where instructional competence includes capacity to create safe, respectful, and responsive classrooms that honor student dignity (Stewart et al., 2021; Bailey et al., 2019).

Theme 5: Development of Literacy and Skills

"Mabantayan nako ang kabaguhan sa akong anak. Gikan sa kinder pa akong mga anak, gitudloan man sila. Nakita nako ang ilahang development. Wala ko naga observe sa klase pero Makita nako sa akong anak ang kabag-uhan. Mismo ang akong anak ang mag tabi kung unsa ilang gihimo." (I observe changes in my children. Since they were in kinder, they have been taught. I have seen their development. Though I do not observe them in their classes, I have seen changes in them. It is my children who tell me about their doings in school.) – P1

"Basin sa pagtudlo sa mga maestra, ok man Sir kay nakita man nako ang kausaban sa akong anak. Sweto nako sa the way sila mu-care sa mga bata." (With regards to teaching, it is OK, Sir, for I have seen the improvement of my child. I knew the way they care for the students.") – P2

On the other hand, the theme of Development of Students' Knowledge and Skills surfaced strongly in the focus group discussion, as parents unanimously validated their children's claims of learning from their teachers. What stood out in their reflections was that "good teaching" was not equated with mere instructional delivery, but interpreted as a transformative force shaping their children's educational trajectories. Parents framed competence less as a technical ability to cover content and more as the capacity to cultivate growth, both cognitive and personal. Their trust in teachers was anchored in visible outcomes—progress in reading and writing—which they regarded as more than functional literacy skills. For them, these were markers of their children's readiness to navigate schooling and life, concrete proof of teachers' effectiveness and care. This interpretation suggests that parents positioned instructional competence at the intersection of pedagogy and human development: teaching was valued not just for transmitting knowledge, but for shaping learners' confidence, motivation, and future possibilities. In this sense, their acknowledgment reflects a broader vision of education as an act of guidance and formation, where teachers are entrusted with nurturing children's holistic growth.

The claim that progress in reading and writing serves as concrete proof of teacher effectiveness and care is supported by work emphasizing observable literacy outcomes as signals of instructional quality and teacher competence. (Cromwell et al., 2024; Lyon & Weiser, 2009; Pressley et al., 1996) These sources argue that modeling, explicit instruction, guided practice, and progress monitoring translate teacher knowledge into visible student gains, which parents and stakeholders interpret as evidence of care and efficacy. (Englert et al., 2020; Pressley et al., 1996)

CONCLUSIONS

Instructional competence in elementary education cannot be adequately understood through technical teaching performance alone. The lived experiences examined in this study indicate that competence is constructed through the interaction of pedagogical effectiveness, supportive teacher–learner relationships, ethical practice, and learners' perceived development. The contrasting accounts of pupils and parents further demonstrate the importance of incorporating multiple stakeholder perspectives into school-based understandings of teacher quality. For educational management, these insights call for approaches to instructional supervision and professional development that place learner dignity, positive relationships, reflective practice, and child protection alongside pedagogical effectiveness. Instructional competence should therefore be understood not only in terms of what teachers enable pupils to learn, but also in terms of the conditions under which that learning occurs.

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Impact of Artificial Intelligence-Enhanced Learning on Critical Thinking Skills of Pre-Service Teachers: A Study of BEd Students

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ABSTRACT Artificial intelligence (AI) is increasingly integrated into higher education, creating opportunities for personalized, adaptive, interactive, and collaborative learning while raising questions about its relationship with students' critical thinking. This study examined AI-enhanced learning and perceived critical thinking skills among 146 first-year Bachelor of Elementary Education students at Agusan del Sur State College of Agriculture and Technology. The study employed a descriptive-comparative and correlational design using an adapted and validated questionnaire. Data were analyzed using descriptive statistics, Mann-Whitney U, Kruskal-Wallis H, and Spearman's rho. Results showed high levels of AI-enhanced learning ($M = 3.16$, $SD = 0.35$) and perceived critical thinking skills ($M = 3.11$, $SD = 0.40$). No significant differences were found according to age or sex. A statistically significant moderate positive association was found between AI-enhanced learning and perceived critical thinking skills ($p = .574$, $p < .01$). The findings indicate that students reporting greater AI-enhanced learning also tended to report stronger critical thinking. The study highlights the importance of purposeful, critically guided AI integration in teacher education while recognizing that the correlational, self-reported data do not establish causality.

Keywords: *AI-enhanced learning, artificial intelligence, critical thinking, pre-service teachers, teacher education*

INTRODUCTION

Artificial intelligence (AI) has become increasingly influential in higher education as institutions adopt digital technologies to support teaching, learning, assessment, and student engagement. AI-enabled educational applications can provide automated feedback, intelligent tutoring, learning analytics, and differentiated learning experiences that respond to learners' needs and progress (Holmes et al., 2019; Luckin, 2020). In higher education, AI applications have increasingly supported instruction and student learning, although research has also emphasized the need to examine their pedagogical rather than purely technological value (Zawacki-Richter et al., 2019). More recently, the rapid development of generative AI has further expanded opportunities for students to obtain immediate explanations, generate ideas, explore alternative solutions, and interact with information in ways that may reshape conventional learning practices. Consequently, effective participation in AI-supported learning environments increasingly requires students to develop both AI literacy and the critical-thinking capacity necessary to interpret, question, and evaluate AI-generated information (Walter, 2024).

One important contribution of AI to education is its capacity to facilitate personalized, adaptive, interactive, and collaborative learning experiences. Personalized AI-supported learning can provide resources and activities suited to individual learning needs, while adaptive systems can modify feedback, content, or task difficulty based on learner performance. Interactive applications can offer repeated practice, immediate feedback, simulations, and problem-solving, while collaborative AI environments may facilitate communication, knowledge sharing, and collective inquiry. Jia and Tu (2024) emphasized that AI capabilities can influence students' learning experiences through factors associated with motivation, self-efficacy, and critical-thinking awareness. Similarly, Ng et al. (2023) highlighted the importance of AI-related competencies in supporting learner-centered instructional practices and twenty-first-century skills. These affordances suggest that AI's educational value extends beyond technological convenience when its use is intentionally connected to meaningful learning activities.

AI-supported learning may particularly contribute to the development of critical thinking. Critical thinking enables learners to analyze information, examine assumptions, evaluate evidence and arguments, consider alternative perspectives, and formulate reasoned judgments. It is regarded as an important competence for learners navigating complex information environments and addressing problems that require more than factual recall (Živković, 2016). In this study, critical thinking is examined through the domains of analysis, creating, and evaluating, which represent higher-order cognitive processes involved in examining information, generating possible solutions or ideas, and making judgments based on appropriate criteria. For

pre-service teachers, these competencies matter because future educators are expected not only to acquire knowledge but also to evaluate instructional information, make pedagogical decisions, design meaningful learning experiences, and guide learners in distinguishing credible information from unsupported or inaccurate claims.

AI-supported environments may offer opportunities to develop these higher-order cognitive processes when learners must question, analyze, compare, and evaluate generated information rather than merely receive ready-made answers. Muthmainnah et al. (2022) found that engagement with AI and human-computer interaction technologies can support critical-thinking learning activities. Song and Kong (2021) likewise noted that AI provides educational affordances that may support teaching and learning when educators integrate technologies appropriately into pedagogical processes. AI-generated explanations and feedback may expose learners to alternative perspectives, provide opportunities for iterative problem-solving, and encourage them to reconsider initial responses. For pre-service teachers, these experiences may be particularly valuable because their ability to critically engage with emerging technologies will influence how they select, evaluate, and integrate these tools into their own classroom practices.

Nevertheless, the relationship between AI use and critical thinking should not be viewed as inherently positive. Although AI can support learning, concerns remain regarding excessive dependence on automated systems, academic integrity, misinformation, reduced cognitive effort, and the possibility that students may accept AI-generated responses without adequate evaluation (Aoun, 2020; Selwyn, 2019; Williamson & Piattoeva, 2022). Abbas et al. (2024) further cautioned that extensive reliance on generative AI may produce undesirable educational consequences when students substitute automated assistance for independent reasoning and problem-solving. These concerns matter because AI systems can produce responses that appear convincing despite containing inaccurate, incomplete, or biased information. Thus, the educational contribution of AI may depend less on access or frequency of use alone than on whether learners engage with AI outputs critically, verify information, exercise independent judgment, and use the technology within pedagogically purposeful learning activities. Ethical and human-centered approaches to AI integration are therefore necessary to ensure that technology complements rather than replaces human reasoning (Holmes et al., 2021).

These considerations are particularly significant in teacher education. Pre-service teachers occupy a dual position as current learners and future educators who may eventually determine how AI technologies are introduced and used in elementary classrooms. Their preparation should therefore include not only technical familiarity with AI applications but also the ability to evaluate AI-generated information, recognize limitations and ethical concerns, and make informed pedagogical decisions. Ng et al. (2023) emphasized the relevance of teachers' AI digital competencies to twenty-first-century teaching, while UNESCO's AI competency framework for teachers underscores the importance of a human-centered approach in which educators critically and ethically evaluate AI technologies and determine their appropriate pedagogical use. Developing these competencies during pre-service preparation may consequently help future teachers become more reflective and responsible users of emerging technologies.

Despite the growing body of research on AI in education, important questions remain regarding its relationship with critical thinking among pre-service teachers. Much of the earlier literature on AI in higher education has focused on technological applications, system development, learner support, and general university populations, while comparatively less attention has gone to educators and teacher preparation (Zawacki-Richter et al., 2019). Moreover, the growing availability of generative and adaptive AI technologies has created a need to examine not merely whether students use AI, but how different dimensions of AI-enhanced learning—particularly personalized, adaptive, interactive, and collaborative learning—relate to higher-order cognitive processes. This issue warrants examination in Philippine teacher education, where pre-service teachers must simultaneously develop competence in emerging educational technologies and the critical judgment necessary to use them responsibly. Evidence from specific institutional contexts can help explain how future teachers perceive these learning experiences and provide a basis for informed curriculum and instructional decisions.

Accordingly, this study examined the relationship between AI-enhanced learning and the perceived critical thinking skills of first-year Bachelor of Elementary Education (BEEd) students at Agusan del Sur State College of Agriculture and Technology. Specifically, it sought to determine the perceived level of AI-enhanced learning in terms of personalized, adaptive, interactive, and collaborative learning; determine the perceived level of critical thinking skills in terms of analysis, creating, and evaluating; determine whether AI-enhanced learning and perceived critical thinking skills differ significantly when respondents are grouped

according to age and sex; and determine whether a significant relationship exists between AI-enhanced learning and perceived critical thinking skills. By examining these dimensions, the study seeks to provide empirical evidence that may inform the pedagogically appropriate, critical, and responsible integration of AI technologies into teacher-education programs.

METHODOLOGY

Research Design

This study employed a descriptive-comparative and correlational research design to examine AI-enhanced learning and perceived critical thinking skills among pre-service teachers. The descriptive component was used to determine the respondents' perceived levels of AI-enhanced learning in terms of personalized, adaptive, interactive, and collaborative learning and their perceived critical thinking skills in terms of analysis, creating, and evaluating. The comparative component examined whether these variables differed significantly when respondents were grouped according to age and sex. The correlational component determined the direction and strength of the association between AI-enhanced learning and perceived critical thinking skills.

Sampling Method and Respondents

The participants were 146 first-year Bachelor of Elementary Education (BEEd) students enrolled at Agusan del Sur State College of Agriculture and Technology (ASSCAT). The researchers used universal sampling to include all students in the identified population who met the study criteria. To be included, participants had to be currently enrolled in the BEEd program, have prior exposure to AI-driven learning tools in their academic activities, and voluntarily agree to participate in the study.

Universal sampling covered the eligible first-year BEEd population within the study setting. However, because participants were drawn from a single year level and institution, the findings apply primarily to the population investigated and should be generalized cautiously to other pre-service teacher populations and higher education institutions.

Research Instrument

Data were collected using an adapted and contextualized questionnaire based on the AI-enhanced learning instrument of Jia and Tu (2024). The questionnaire consisted of two major components. The first measured students' perceptions of AI-enhanced learning across four dimensions: personalized learning, adaptive learning, interactive learning, and collaborative learning. The second assessed students' perceptions of their critical thinking skills in the domains of analysis, creating, and evaluating.

The items were rated on a four-point Likert scale, and responses were interpreted according to the corresponding scale intervals. Because the critical thinking component relied on students' self-reports, the scores were treated as measures of perceived critical thinking skills rather than direct performance-based measures of critical thinking.

The adapted questionnaire underwent content validation by subject-matter experts in education and educational technology to assess the relevance and appropriateness of the items to the constructs and study context. Reliability testing was also conducted to determine the internal consistency of the instrument before its administration. The final manuscript should report the number of items under each dimension, the specific validation procedure and results, and the reliability coefficient(s), such as Cronbach's alpha, based on the researchers' actual validation and reliability records.

Data Collection Procedure

Prior to data collection, permission was obtained from the appropriate institutional authorities. Eligible participants were informed of the purpose of the study, the procedures involved, and their rights as research participants. The questionnaire was administered during regular class hours to facilitate orderly data collection and minimize disruption to academic activities.

Completed questionnaires were retrieved after administration and checked for completeness and consistency. The researchers then organized, coded, and prepared responses for statistical analysis.

Appropriate measures were observed throughout data collection and processing to maintain the accuracy, confidentiality, and integrity of the information obtained.

Ethical Considerations

The study strictly adhered to established ethical standards for educational research in accordance with institutional and national guidelines. Prior to participation, respondents were provided with a clear explanation of the study's purpose, procedures, and their rights, after which informed consent was duly obtained. Participation was entirely voluntary, and respondents were informed of their right to withdraw at any time without penalty or disadvantage. To protect data privacy, confidentiality and anonymity were maintained through coded identifiers, ensuring no personally identifiable information was disclosed. All collected data were securely stored in protected files accessible only to the researchers and were utilized exclusively for academic and research purposes. These measures ensured compliance with ethical principles of respect for persons, beneficence, and data integrity, thereby safeguarding the rights and welfare of all participants.

Data Analysis

Descriptive and inferential statistical procedures were used to analyze the data. Frequency counts and percentages were used to describe the respondents' demographic characteristics. Means and standard deviations were computed to summarize the respondents' perceived levels of AI-enhanced learning and critical thinking skills.

For comparative analysis, the Mann–Whitney U test was used to determine whether significant differences existed by sex, while the Kruskal–Wallis H test was used to examine differences across age groups. These non-parametric procedures were used given the characteristics and measurement level of the data.

The Spearman rank-order correlation coefficient (Spearman's rho) was used to determine the direction and strength of the association between AI-enhanced learning and perceived critical thinking skills. Statistical significance was evaluated at the .05 level. A p-value below .05 was interpreted as evidence of a statistically significant relationship or difference, as applicable.

RESULTS AND DISCUSSION

Demographic Profile of Respondents

The demographic profile of the respondents is presented in terms of age and sex. Out of 146 first-year BEd students, the majority (104 or 71.2%) were aged 18–19, followed by those aged 20–21 (39 or 26.7%), while only a small proportion belonged to the 22–23 age group (3 or 2.1%). In terms of sex, the sample was predominantly female, comprising 117 respondents (80.1%), whereas males accounted for 29 respondents (19.9%).

This distribution indicates that the respondents largely fall within the typical age range of first-year college students, suggesting a relatively homogeneous cohort in terms of developmental stage and academic exposure. The predominance of female students reflects the common gender trend in teacher education programs in the Philippines, where female enrollment is significantly higher than male participation. Such demographic characteristics may influence learning preferences, engagement with digital tools, and collaborative tendencies in academic settings.

The implications of this profile suggest that AI-driven learning interventions can be designed to cater to a digitally inclined and relatively young population, who are generally more adaptable to emerging educational technologies. Moreover, the gender distribution highlights the need for inclusive and gender-responsive instructional strategies, ensuring that both male and female students benefit equitably from AI integration. For teacher education institutions, these findings provide a basis for tailoring curriculum design, instructional delivery, and capacity-building initiatives that are responsive to the demographic realities of BEd students in Philippine state colleges and universities.

As reported by Muralidharan et al. (2023), designing age-appropriate AI learning tools requires collaboration among educators, clinicians (where relevant), families, and researchers to address developmental

appropriateness, safety, and engagement across age groups. Furthermore, gender-responsive and culturally sustaining approaches should be embedded within AI education platforms to promote equity, inclusion, and positive outcomes for all learners, regardless of sex or gender identity (Holmes et al., 2023; Knox, 2023; UNESCO, 2023).

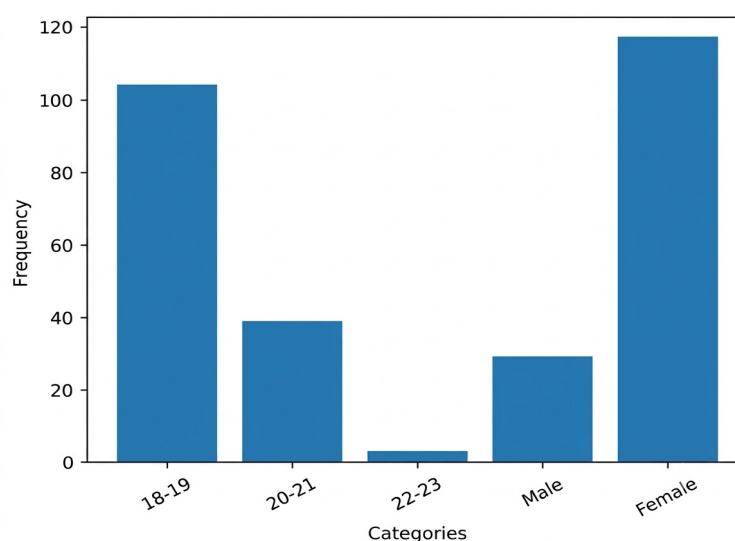


Figure 1. Profile of the Respondents According to their Age and Sex

Level of Impact of AI-driven Learning Tools Utilization

The level of students' perception of artificial intelligence (AI)-driven learning tools utilization is presented in terms of four dimensions: personalized learning, adaptive learning, interactive practice, and collaborative learning. Overall, the results indicate a high level of perception ($M = 3.16$, $SD = 0.35$), suggesting that BEd students generally recognize the value of AI-powered tools in enhancing their learning experience. Among the four dimensions, adaptive learning obtained the highest mean ($M = 3.20$), followed by personalized learning ($M = 3.16$), while both interactive practice and collaborative learning registered equal means ($M = 3.14$). This distribution reflects consistently positive perceptions across all domains of AI-driven learning.

Personalized learning yielded high to very high ratings, with students strongly agreeing that AI tools help them choose learning activities aligned with their interests and find relevant content that supports their learning goals. Similarly, adaptive learning results indicate that students perceive AI as responsive to their individual learning needs, particularly in providing feedback and adjusting content difficulty. Interactive practice also received high ratings, highlighting the role of AI in promoting engagement through simulations, activities, and practice exercises. Meanwhile, collaborative learning recorded some of the highest individual item means (up to $M = 3.31$), indicating that AI tools significantly facilitate peer interaction, knowledge sharing, and collaborative problem-solving.

These findings suggest that AI-driven learning tools are effective in supporting student-centered and flexible learning environments, which are essential in modern teacher education. The high perception across all dimensions indicates that AI can enhance not only individual learning pathways but also social and interactive aspects of learning. For Philippine state universities and colleges (SUCs), these results support the integration of AI technologies into the BEd curriculum as part of digital transformation initiatives aligned with CHED and DOST priorities. Furthermore, the strong performance of adaptive and collaborative learning dimensions highlights the potential of AI to develop both independent and cooperative learning skills, which are critical competencies for future educators.

Ng et al., (2023) explored teachers' AI digital competencies and twenty-first century skills, emphasizing that AI competencies enable teachers to design and implement adaptive, learner-centered instruction and to foster collaboration among students. This supports the link between AI-enabled adaptability and both individual and social learning outcomes. Likewise, Trevisan et al., (2024) discussed drivers of digital realities for ongoing teacher professional learning, including big data, AI, and learning analytics, highlighting AI-driven professional learning environments and dashboards as catalysts for collaborative practice and

reflective reasoning. This underpins how AI tools can mediate collaborative professional growth and collective instructional practices, aligning with future educator competencies.

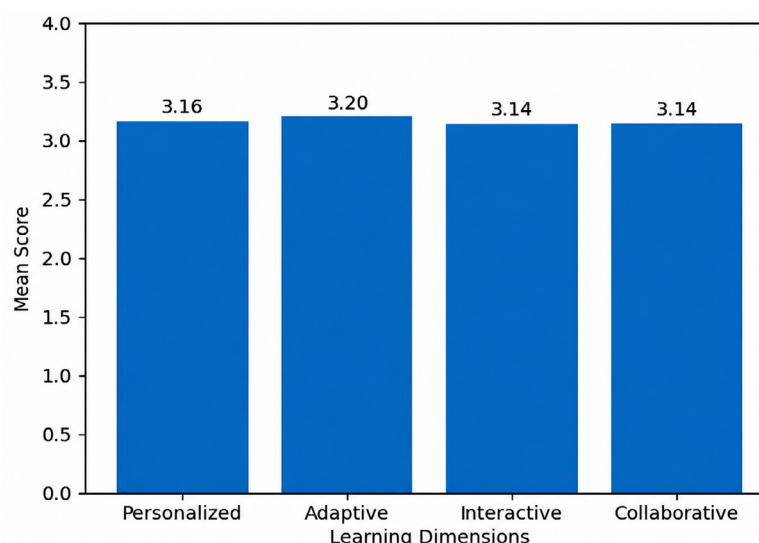


Figure 2. Level of Artificial Intelligence-Driven Learning Tools Utilization by Dimension

Level of Students Perception on Critical Thinking Skills

The level of students' perception of their critical thinking skills is presented across three domains: analysis, creating, and evaluating. Overall, the results indicate a high level of critical thinking ($M = 3.11$, $SD = 0.40$) among BEd students. Among the domains, creating obtained the highest mean ($M = 3.14$), followed by analysis ($M = 3.11$), while evaluating recorded the lowest, though still high, mean ($M = 3.09$). This distribution reflects a consistently strong self-assessment of higher-order thinking skills across all cognitive domains.

The analysis domain shows that students are capable of identifying assumptions, evaluating sources, and examining problems from multiple perspectives, with all indicators rated at a high level. The creating domain yielded the highest ratings, indicating that students are particularly confident in generating innovative ideas, adapting concepts to new contexts, and developing creative solutions. Meanwhile, the evaluating domain, although slightly lower in mean, still demonstrates that students possess the ability to assess arguments, determine the reliability of information, and distinguish between fact and opinion. The consistently high ratings across all items suggest that students perceive themselves as competent in executing complex cognitive tasks aligned with higher-order thinking skills.

These findings suggest that BEd students are developing the critical thinking competencies necessary for effective teaching practice in the 21st-century learning environment. The relatively higher scores in the creating domain indicate a strong potential for innovation and adaptability, which are essential in designing learner-centered and context-responsive instruction. However, the slightly lower mean in the evaluating domain highlights the need to further strengthen students' skills in judgment, evidence-based reasoning, and critical evaluation. For Philippine state universities and colleges (SUCs), these results underscore the importance of integrating instructional strategies—such as problem-based learning, inquiry-based approaches, and AI-supported learning tools—that continuously enhance all dimensions of critical thinking, ensuring that future educators are well-equipped for dynamic and technology-driven classrooms.

Based on the research works of Muthmainnah et al., (2022), KESGIN, (2025), Lin et al., (2022), and Yan et al., (2025), the generative AI, adaptive feedback, and AI-assisted collaboration tools have demonstrated potential to enhance critical thinking when embedded in pedagogy aligned with inquiry and problem-based tasks. AI-enabled environments can scaffold reasoning, support evidence-based argumentation, and facilitate collaborative inquiry by providing real-time feedback and structuring tasks that promote argumentation and analysis.

Table 1: Level of Students' Perception on Critical Thinking Skills

Domain	Indicator	Mean	SD	Interpretation
ANALYSIS	Identify assumptions in arguments	3.09	0.42	High
	Evaluate credibility of sources	3.12	0.42	High
	Critique reasoning of others	3.11	0.42	High
	Analyze problems from multiple perspectives	3.08	0.42	High
	Identify cause-and-effect relationships	3.14	0.42	High
	Sub-Mean	3.11	0.42	High
CREATING	Generate innovative solutions	3.11	0.39	High
	Develop creative approaches	3.18	0.39	High
	Brainstorm new ideas	3.14	0.39	High
	Communicate creative ideas	3.12	0.39	High
	Adapt ideas to new contexts	3.15	0.39	High

Test on Significant Difference in the Perceived Level of Students AI-driven Learning Tools Utilization and Critical Thinking Skills

The test of significant difference in the perceived level of AI-driven learning tools utilization and critical thinking skills is presented based on age and sex. The results consistently show that all computed p-values are greater than the 0.05 level of significance, indicating that there are no statistically significant differences across both demographic variables. For AI-driven learning tools utilization, all dimensions—including personalized, adaptive, interactive, and collaborative learning—yielded non-significant results for both age (p-values ranging from 0.58 to 0.78) and sex (p-values ranging from 0.08 to 0.45), including the overall mean. Similarly, for critical thinking skills, all domains—analysis, creating, and evaluating—also showed non-significant differences across age and sex, with p-values ranging from 0.30 to 0.73.

These findings suggest that students' perceptions of AI-driven learning tools and their critical thinking skills are statistically comparable regardless of demographic characteristics. This implies that both younger and older students, as well as male and female respondents, exhibit similar levels of engagement with AI technologies and comparable abilities in higher-order thinking skills. The absence of significant variation indicates that demographic factors such as age and sex do not substantially influence how students perceive or benefit from AI-driven learning environments.

The implications of these findings are particularly important for curriculum design and policy development in Philippine higher education institutions, especially within state universities and colleges (SUCs). The results support the implementation of uniform and inclusive AI integration strategies, as the benefits of AI-driven learning appear to be equally accessible across diverse student groups. This reinforces the idea that AI can serve as an equitable educational tool that supports inclusive learning environments. Furthermore, institutions may focus more on enhancing pedagogical approaches and technological infrastructure rather than differentiating interventions based on demographic variables, ensuring that all students develop critical thinking skills necessary for effective teaching and lifelong learning.

As supported by Allison et al., (2025), Adegoke et al., (2025), Yang & Jimenez-Luque, (2025), and McMahon & Firestone, (2024), the institutions can maximize AI impact by prioritizing pedagogical design (e.g., inquiry-driven, problem-based learning) and robust technological infrastructure, rather than differentiating interventions by demographic groups, to achieve broad-based development of critical thinking skills among all students.

Table 2. Test on Significant Difference in the Perceived Level of Students AI-driven Learning Tools Utilization and Critical Thinking Skills.

AI-Driven Learning Tools Utilization	p-value	Interpretation
Age		
Personalized Learning	0.58	Not Significant
Adaptive Learning	0.64	Not Significant
Interactive Learning	0.73	Not Significant
Collaborative Learning	0.78	Not Significant
Sex		
Personalized Learning	0.45	Not Significant
Adaptive Learning	0.08	Not Significant
Interactive Learning	0.14	Not Significant
Collaborative Learning	0.11	Not Significant
Critical Thinking		
Age		Not Significant
Analysis	0.38	Not Significant
Creating	0.30	Not Significant
Evaluating	0.57	Not Significant
Sex		
Analysis	0.73	Not Significant
Creating	0.60	Not Significant
Evaluating	0.37	Not Significant

Test on Significant Relationship Between AI-driven Learning Tools and Critical Thinking Skills

The relationship between AI-driven learning tools utilization and critical thinking skills was examined using Spearman's rho correlation. The results revealed a moderate positive correlation ($r = 0.574$), which is statistically significant at the 0.01 level ($p < 0.01$). This indicates that as students' utilization of AI-driven learning tools increases, their level of critical thinking skills also tends to improve.

The positive direction of the correlation suggests that AI-driven learning tools—such as adaptive, interactive, collaborative, and personalized systems—play a meaningful role in enhancing higher-order cognitive skills. The moderate strength of the relationship implies that while AI is an important contributing factor, critical thinking is also influenced by other variables such as teaching strategies, learner motivation, and academic environment.

The implications of this finding are significant for teacher education and policy development in Philippine higher education institutions. It supports the integration of AI technologies as pedagogical enablers that can foster analytical, creative, and evaluative thinking among pre-service teachers. However, the moderate correlation also highlights the need for balanced instructional design, where AI tools are complemented by inquiry-based learning, reflective practice, and guided instruction. For SUCs, this underscores the importance of investing in both technological infrastructure and faculty capability-building programs, ensuring that AI is used strategically to enhance—not replace—students' cognitive development.

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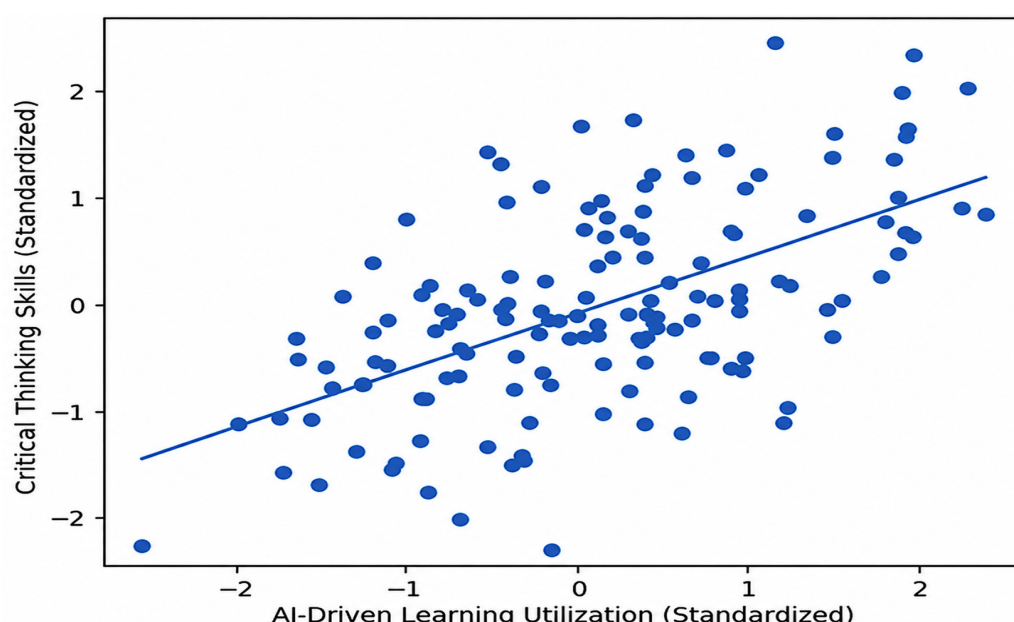


Figure 3. Scatter plot with regression line on Relationship Between AI-driven Learning Tools and Critical Thinking Skills'

CONCLUSIONS

The integration of artificial intelligence in teacher education should extend beyond providing access to emerging technologies and emphasize their purposeful, responsible, and pedagogically appropriate use. AI can support learning when it encourages pre-service teachers to analyze information, generate ideas, evaluate evidence, and exercise independent judgment rather than rely on automated responses. Teacher education institutions should therefore prepare future educators to use AI critically and ethically while maintaining human judgment at the center of teaching and learning. Developing AI competence alongside critical thinking can help pre-service teachers make informed decisions about when, why, and how to use AI in educational contexts. Such preparation is essential for ensuring that AI complements rather than replaces reasoning, creativity, reflection, and professional judgment. Future research may extend the inquiry through performance-based measures of critical thinking and longitudinal, experimental, or multi-institutional designs. These approaches can provide a broader understanding of how AI-supported learning can be appropriately incorporated into future teacher preparation.

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Pre-Service Teachers in Virtual Classrooms: A Phenomenological Inquiry in a Philippine Context

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ABSTRACT The transition to virtual learning during the COVID-19 pandemic created significant challenges for pre-service teachers, particularly in resource-constrained educational settings. This phenomenological study explored the lived experiences of pre-service teachers in implementing virtual classes at Agusan del Sur State College of Agriculture and Technology. Guided by Moore's Transactional Distance Theory, the study involved 10 purposively selected pre-service teachers who participated in in-depth interviews and a focus group discussion. Data were analyzed using Colaizzi's phenomenological method. Four themes emerged: unstable connectivity as an obstacle to pedagogical engagement, power interruptions and the fragility of digital instruction, domestic disruptions and the blurring of learning boundaries, and technological limitations and the strain of digital minimalism. Participants responded to these constraints through adjustments in instructional arrangements and available technological resources. Viewed through transactional distance, the findings demonstrate how infrastructural and contextual limitations can disrupt dialogue, instructional structure, and learner autonomy in virtual environments. The study underscores the need for teacher education institutions to strengthen digital pedagogy and provide appropriate technological and institutional support for pre-service teachers.

Keywords: *digital pedagogy, pre-service teachers, transactional distance, virtual classrooms, phenomenology*

INTRODUCTION

The COVID-19 pandemic brought an unprecedented disruption to education and accelerated the transition from conventional face-to-face instruction to technology-mediated and virtual learning environments. Teacher education was particularly affected because the preparation of future teachers traditionally depends not only on academic coursework but also on interaction, observation, demonstration, field experiences, and opportunities to develop professional teaching practices. The abrupt transition to online instruction therefore required teacher education institutions to reconsider how to sustain these experiences in virtual environments. Rapanta et al. (2020) emphasized that effective online instruction requires more than transferring classroom content to digital platforms; it requires deliberate attention to teacher presence, learning activities, interaction, and instructional design. Similarly, Flores and Swennen (2020) argued that the pandemic created significant implications for teacher education by requiring institutions, teacher educators, and future teachers to reconsider established approaches to teaching and professional preparation.

For pre-service teachers, this transition presented a distinctive challenge because they occupied the dual position of being learners and developing educators. They were expected to participate in online learning while simultaneously developing the technological, pedagogical, and professional competencies required for teaching in digitally mediated environments. The experience therefore extended beyond learning how to operate digital platforms. It required pre-service teachers to reconsider how lessons could be delivered, how interaction with learners could be maintained, and how instructional difficulties could be addressed when conventional classroom routines were unavailable. Virtual teaching also raised broader questions concerning the preparation and professional identities of future educators because teacher education involves developing understandings of what it means to teach and respond to learners under changing educational conditions. The transition to virtual instruction consequently highlighted the need for teacher preparation to address responsiveness, equity, inclusion, and the professional development of pre-service teachers as virtual learners and emerging educators (Cutri et al., 2020).

However, the effectiveness of this transition depended considerably on access to technological resources and the conditions under which online learning occurred. Studies conducted during the pandemic consistently identified internet connectivity, availability of appropriate devices, digital competence, home learning environments, and psychological pressures as significant concerns in online education (Coman et al., 2020; Sahu, 2020). These conditions can influence learners' ability to participate consistently, communicate with instructors and peers, access learning resources, and complete academic requirements. Consequently, digital technologies can create opportunities for continued education while simultaneously exposing inequalities in access and participation. These concerns matter in teacher education because technological

limitations may affect not only pre-service teachers' learning experiences but also their opportunities to practice the pedagogical skills expected of future educators.

These challenges were especially evident in the Philippine context. The rapid adoption of flexible and online learning exposed persistent inequalities in internet connectivity, device access, learning environments, and institutional readiness. Toquero (2020) identified technological infrastructure and access as key concerns confronting Philippine higher education during the pandemic-driven transition. In a study of Filipino college students, Barrot et al. (2021) found that online learning challenges involved technological, individual, domestic, institutional, and community-related factors, with the home learning environment emerging as a particularly significant concern. Students responded with strategies such as resource management, help-seeking, time management, improving technical skills, and controlling their learning environments. These findings demonstrate that online learning experiences cannot be understood solely in terms of access to digital platforms because participation is also shaped by the social, material, and environmental conditions in which learning takes place.

Such conditions may become more pronounced in rural and resource-constrained communities where reliable internet connectivity, uninterrupted electricity, and appropriate digital devices cannot always be assumed. For pre-service teachers, unstable connectivity or inadequate technological resources can disrupt communication, lesson delivery, classroom interaction, and opportunities to respond to learners. These difficulties may therefore affect not only participation in virtual instruction but also how future teachers learn to make pedagogical decisions under uncertain conditions. At the same time, responding to such constraints may require resourcefulness, flexibility, self-regulation, and the capacity to modify instructional strategies. Understanding these experiences matters because the competencies developed during teacher preparation can shape how pre-service teachers respond to diverse and technologically mediated teaching environments.

Moore's Transactional Distance Theory helps explain the relationship between interaction, instructional organization, and learner independence in virtual education. Moore (1993) conceptualized transactional distance as the psychological and communicative space that may exist between teachers and learners in distance education and identified dialogue, structure, and learner autonomy as central elements influencing that distance. Dialogue concerns meaningful communication between teachers and learners; structure refers to the flexibility or rigidity of instructional design; and learner autonomy concerns the extent to which learners assume responsibility for their own learning. Transactional distance therefore extends beyond physical separation because learners who are geographically distant may still experience meaningful educational interaction when adequate dialogue, appropriate instructional structures, and suitable levels of autonomy are present.

The theory is particularly relevant to virtual teacher education because technological and environmental constraints can alter each of these dimensions. Unstable internet connectivity may interrupt dialogue and feedback, power interruptions may interfere with instructional structure and continuity, and limited opportunities for synchronous interaction may require learners to exercise greater autonomy. Falloon (2011), applying Transactional Distance Theory to an online teacher education environment, showed that virtual classrooms can promote dialogue while also affecting instructional structure and learners' perceptions of autonomy. The study also showed that dialogue, structure, and autonomy operate in a complex, interconnected way rather than as isolated elements.

Figure 1 presents the conceptual framework of the study, which illustrates how the lived experiences of pre-service teachers in implementing virtual classes were examined through three interrelated dimensions: experiences, coping mechanisms, and insights. Experiences refer to the conditions, challenges, and situations pre-service teachers encountered while participating in and implementing virtual instruction. Coping mechanisms represent the strategies and adaptive practices they employed in response to technological, instructional, and environmental challenges, while insights refer to the meanings and professional understandings they developed from these experiences.

These dimensions were interpreted through Moore's Transactional Distance Theory (1993), particularly the concepts of dialogue, structure, and learner autonomy. The theory serves as an interpretive lens for understanding how disruptions in communication, instructional arrangements, and demands for independent action shaped the participants' experiences and responses in virtual classrooms. Through this framework, the study seeks to understand not only the challenges pre-service teachers encountered but also how they adapted to these conditions and constructed professional meanings from their experiences within a resource-constrained teacher education context.

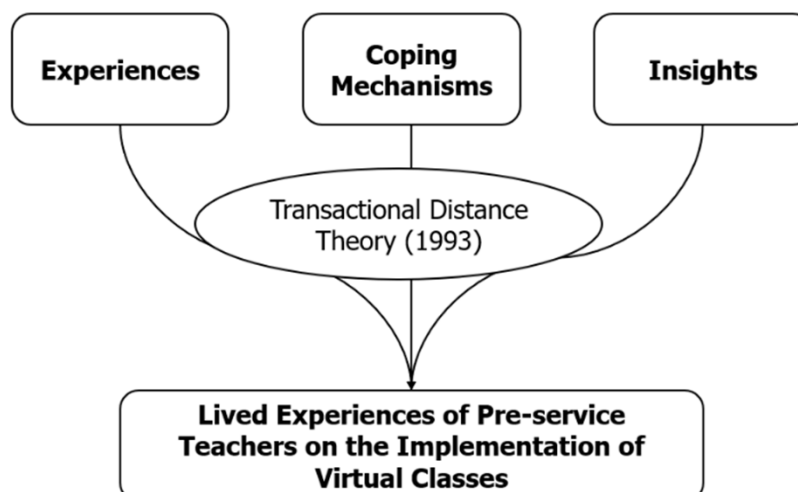


Figure 1 Conceptual Framework of the Study

Existing research has provided considerable evidence regarding the challenges associated with emergency remote and online learning, including internet connectivity, access to technological resources, home learning environments, psychological pressures, and pedagogical readiness (Barrot et al., 2021; Coman et al., 2020; Rapanta et al., 2020; Toquero, 2020). Nevertheless, much of this literature has concentrated on the general experiences of university students, institutional readiness, or the transition of practicing teachers and university instructors to online teaching. These perspectives are important but do not fully explain the experiences of pre-service teachers who were simultaneously completing their professional preparation and learning to perform teaching responsibilities within virtual environments. Moreover, experiences documented across broad national or international settings may not adequately represent teacher preparation in rural state colleges where technological and infrastructural limitations may influence virtual teaching differently. This leaves a need for context-specific inquiry into how pre-service teachers in resource-constrained Philippine teacher education settings experienced virtual teaching, responded to its challenges, and constructed meaning from these experiences.

Addressing this gap is important because the experiences of pre-service teachers during virtual instruction may provide insights for teacher education beyond the immediate circumstances of the pandemic. Digital and blended forms of instruction continue to have relevance to contemporary education, making technological competence alone insufficient preparation for future teachers. Teacher education programs must also consider how future educators maintain interaction, adjust instructional structures, exercise professional judgment, and respond to technological and contextual constraints. Examining these experiences phenomenologically can therefore illuminate not merely the difficulties participants encountered but how they understood, negotiated, and learned from those experiences as developing teachers.

Accordingly, this study explored the lived experiences of pre-service teachers in implementing virtual classes at Agusan del Sur State College of Agriculture and Technology (ASSCAT). Specifically, it sought to understand the experiences and challenges pre-service teachers encountered, how they responded to and adapted to the demands of virtual instruction, and the insights they developed from these experiences. Guided by Moore's Transactional Distance Theory, the study examined these lived experiences in relation to dialogue, instructional structure, and learner autonomy to better understand how pre-service teachers navigated virtual teaching within a resource-constrained Philippine higher education context. The study ultimately seeks to contribute context-sensitive evidence that may inform teacher education programs, digital pedagogy preparation, institutional support, and the preparation of future teachers for flexible and technology-mediated learning environments.

METHODOLOGY

Research Design

This study employed a qualitative descriptive phenomenological research design to explore and describe the lived experiences of pre-service teachers in the implementation of virtual classes during the new normal. A phenomenological approach was appropriate because the study sought to understand the meanings participants attributed to their experiences of teaching and learning in virtual environments rather than to measure predetermined variables or establish causal relationships. Phenomenology allows researchers to examine participants' subjective experiences and develop a detailed understanding of a phenomenon as it is experienced by those directly involved (Blankenship, 2016).

The inquiry focused on three interrelated dimensions of the phenomenon: the experiences of pre-service teachers in virtual classes, the coping mechanisms they employed in responding to encountered challenges, and the insights they developed from these experiences. Moore's Transactional Distance Theory (1993) served as an interpretive lens for understanding these experiences in relation to dialogue, instructional structure, and learner autonomy within a digitally mediated learning environment.

Participants and Sampling

Ten pre-service teachers from Agusan del Sur State College of Agriculture and Technology (ASSCAT) were purposively selected based on their experience with virtual classes during the pandemic. Participants were 18–35 years old, actively engaged in virtual classes, and officially affiliated with the institution. Five participated in individual in-depth interviews and five in the focus group discussion (FGD). Data collection continued until no substantially new themes emerged, consistent with phenomenological inquiry that emphasizes depth and information-rich cases (Crouch & McKenzie, 2006)

Data Gathering Procedures

Data were gathered through semi-structured in-depth interviews and an FGD. The semi-structured protocol allowed participants to describe their virtual-class experiences, challenges, coping mechanisms, and insights while permitting follow-up questions for clarification and elaboration. Individual interviews generated detailed personal accounts, while the FGD provided opportunities to compare and expand shared experiences. Participation was voluntary and based on informed consent, and appropriate measures were taken to protect participants' privacy.

Data Analysis

Data were analyzed using Colaizzi's (1978) phenomenological method. Transcripts were read repeatedly, significant statements were identified, meanings were formulated, and related meanings were clustered into themes. These themes were integrated into an exhaustive description and fundamental structure of the participants' lived experiences. Member checking was conducted to validate the interpretations. Coding was performed manually, with the researchers collaboratively reviewing and refining themes through discussion and consensus.

Trustworthiness of the Study

Trustworthiness was established using Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability. Credibility was supported through member checking and the use of interviews and FGDs; transferability through contextual descriptions; dependability through an audit trail; and confirmability through reflexive documentation. Because the researchers were affiliated with ASSCAT, reflexivity was maintained to recognize and minimize the influence of researcher assumptions and potential biases.

Ethical Considerations

Informed consent, voluntary participation, confidentiality, and the right to withdraw were observed throughout the study. The research was guided by the principles of respect for persons, beneficence, and justice in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral

Research, 1979). Participants' information was handled in accordance with the Data Privacy Act of 2012 (Republic Act No. 10173) to protect confidentiality and personal data.

RESULTS AND DISCUSSION

Experiences of Pre-service Teachers on the Implementation of Virtual Classes in the New Normal

Analysis of the participants' accounts revealed four major themes describing their experiences in implementing virtual classes: (1) unstable connectivity as an obstacle to pedagogical engagement, (2) power interruptions and the fragility of digital instruction, (3) domestic disruptions and the blurring of learning boundaries, and (4) technological limitations and the strain of digital minimalism. These themes illustrate how technological infrastructure, home environments, and access to functional devices shaped the participants' experiences of virtual instruction.

Table 1. Major Themes and Core Ideas on Experiences of Pre-service Teachers on the Implementation of Virtual Classes in the New Normal.

Major Themes	Core Ideas
Unstable Connectivity as an Obstacle to Pedagogical Engagement	- Experiencing an increasing number of pupil absences due to poor internet connection - Struggling to understand lessons due to unstable connections - Experiencing delays in joining virtual classes - Feeling pressured by cooperating teachers during connectivity disruptions - Relocating to different areas to secure a stable internet signal
Power Interruptions and the Fragility of Digital Instruction	- Facing abrupt power interruptions that prevent pupils from joining virtually - Experiencing unexpected delays in class schedules - Encountering sudden electricity blackouts during live instruction
Domestic Disruptions and the Blurring of Learning Boundaries	- Managing pupils who get easily distracted by home environments - Experiencing instructional disruptions from parents and family members - Encountering background noise from animals and household activities
Technological Limitations and the Strain of Digital Minimalism	- Experiencing laptop lag and freeze during virtual class sessions - Feeling frustrated with poor device performance - Handling hardware failures during teaching demonstrations

Unstable Connectivity as an Obstacle to Pedagogical Engagement.

Unstable internet connectivity emerged as a persistent challenge affecting the participants' ability to sustain virtual instruction. Poor connections resulted in delayed entry into virtual classes, difficulty following lessons, interruptions in communication, and reduced pupil participation. For participants residing in areas with limited connectivity, maintaining access sometimes required considerable effort. One participant described this experience: "Had to climb a hill just to receive signal, it was like seeking education." This account illustrates that connectivity was not simply a technical concern but a condition that shaped participants' access to and engagement in virtual teaching.

The finding reflects the broader technological difficulties experienced by Filipino students during online learning. Barrot et al. (2021) identified internet connectivity and other technological limitations among the challenges encountered by college students during the pandemic, alongside problems associated with the learning environment and interaction. Similarly, Baticulon et al. (2021) reported that reliable internet access represented an important technological barrier to online education in the Philippines. These findings suggest that participation in virtual instruction is strongly conditioned by the availability and stability of digital infrastructure.

From the perspective of Moore's Transactional Distance Theory (1993), unstable connectivity can increase transactional distance by disrupting dialogue between teachers and learners. When communication becomes intermittent, opportunities for immediate clarification, feedback, questioning, and interaction are reduced. Falloon (2011) demonstrated that meaningful dialogue in virtual classrooms is an important element in shaping transactional distance and that the relationship among dialogue, structure, and learner autonomy

is complex. Thus, connectivity problems experienced by the participants did more than interrupt access; they potentially weakened the interaction necessary to sustain engagement in virtual instruction.

Despite these difficulties, participants responded by adjusting schedules, preparing materials in advance, using alternative means of access, and moving to locations where stronger signals were available. These responses are consistent with Barrot et al. (2021), who found that Filipino students used strategies such as resource management, help-seeking, technical skills enhancement, time management, and control of the learning environment to manage online learning challenges. The participants' responses therefore demonstrate adaptive practices developed in response to limitations in their learning and teaching environments.

Power Interruptions and the Fragility of Digital Instruction.

Power interruptions further complicated the implementation of virtual classes. Participants reported unexpected disruptions that prevented pupils from joining sessions, delayed the conduct of classes, and interrupted ongoing instruction. One participant explained, *"I was ready to teach, but the blackout ruined everything."* The experience demonstrates the dependence of virtual instruction on infrastructure beyond the immediate control of both teachers and learners.

The consequences of power interruptions extended beyond temporary inconvenience. Virtual instruction depends on functioning devices, network equipment, and sufficient electrical power to sustain synchronous communication. When electricity was interrupted, planned instructional sequences and interaction could also be disrupted. This finding reinforces the broader concern that infrastructure limitations can constrain the continuity of technology-mediated education, particularly in resource-constrained settings.

Within Transactional Distance Theory, these interruptions can be understood in relation to both dialogue and instructional structure. A scheduled synchronous class assumes that participants can connect and remain present throughout the instructional period. Unexpected power interruptions weaken dialogue by terminating communication and challenge instructional structure by preventing lessons from proceeding according to plan. Moore (1993) emphasized that distance education requires an appropriate relationship among dialogue, structure, and learner autonomy. In contexts where infrastructure is unpredictable, highly rigid synchronous structures may therefore be difficult to sustain.

Participants responded to these disruptions by adjusting schedules, using backup power when available, and shifting to asynchronous approaches. Such responses indicate an effort to make instructional arrangements more flexible when planned synchronous instruction became impossible. Rather than treating the original lesson structure as fixed, the participants modified how learning activities could be delivered. This suggests that their experiences with power interruptions required them to exercise flexibility and contingency planning in maintaining instructional continuity.

Domestic Disruptions and the Blurring of Learning Boundaries.

The home environment emerged as another significant source of disruption. Participants reported that pupils were easily distracted by activities within their homes, while family members, household noise, and animals sometimes interfered with virtual instruction. The participants themselves were also required to conduct educational activities within spaces ordinarily associated with family life. As one participant explained, *"I was educating while my brothers were watching TV next to me."*

This finding demonstrates how virtual learning blurred the boundaries between home and classroom. Unlike conventional classroom settings, where instructional spaces are organized primarily for teaching and learning, participants had limited control over household activities, noise, space, and interruptions. Consequently, virtual teaching required them to negotiate their instructional responsibilities within environments that simultaneously served domestic and educational functions.

The finding is strongly supported by Philippine research. Barrot et al. (2021) found that the home learning environment was the greatest challenge reported by students in their study, particularly because of household distractions, noise, and limitations in learning space and facilities. Baticulon et al. (2021) likewise identified responsibilities at home and lack of physical space conducive to studying among common barriers to online learning. These studies demonstrate that the effectiveness of online education depends not only on

technological access but also on whether learners and teachers have environments conducive to sustained educational participation.

These domestic disruptions also have implications for dialogue and learner autonomy under Moore's (1993) framework. Environmental distractions may reduce participants' capacity to remain engaged in interaction, while the absence of a controlled classroom environment places greater responsibility on individuals to regulate their time, attention, and learning conditions. The participants' attempts to negotiate schedules and create workable learning spaces therefore reflect the increased self-regulation required when education occurs within the home.

More importantly, these experiences reveal that virtual teaching required pre-service teachers to negotiate multiple roles within the same physical space. The home became simultaneously a personal, family, academic, and instructional environment. Their experiences therefore suggest that effective virtual teaching involves not only technological competence but also the capacity to manage contextual conditions that may affect teaching and learner engagement.

Technological Limitations and the Strain of Digital Minimalism.

The fourth theme concerned limitations in the technological devices available for virtual instruction. Participants reported laptop lag, poor device performance, and equipment failure during virtual teaching demonstrations. These difficulties affected their ability to conduct instructional activities efficiently and generated frustration when devices could not adequately support the demands of virtual classes. One participant described the difficulty of using limited technology by stating, *"My phone heats up after 30 minutes of class, I just tough it out."*

The finding illustrates an important distinction between internet access and device capability. Connectivity determines whether teachers and learners can enter a virtual environment, whereas device limitations affect what they can effectively accomplish once connected. Hardware performance can influence access to applications, multimedia materials, synchronous communication, and other technology-mediated instructional activities.

This finding is consistent with Barrot et al. (2021), who identified technological challenges as part of Filipino students' online learning experiences. Baticulon et al. (2021) similarly classified hardware, software, internet connectivity, gadget sharing, and related concerns as technological barriers to online learning. Thus, possession of a device alone does not necessarily guarantee equitable participation when the device lacks the capacity or reliability required for sustained virtual instruction.

From the perspective of Transactional Distance Theory, technological limitations can affect both dialogue and structure. Devices that cannot reliably support virtual platforms may restrict communication and prevent participants from fully engaging with planned instructional activities. Falloon (2011) noted that technologies used in virtual classrooms influence the interaction among dialogue, structure, and learner autonomy. Technology therefore functions not merely as a delivery mechanism but as part of the conditions through which interaction and participation in virtual learning are made possible.

Participants attempted to manage these constraints through technological improvisation and the use of available resources. Such responses indicate resourcefulness, but they also highlight an important equity concern: successful participation in virtual education should not depend primarily on an individual's ability to compensate for inadequate technological resources. Teacher education institutions therefore need to consider both digital competence and access to functional technologies when preparing pre-service teachers for technology-mediated instruction.

CONCLUSION

The lived experiences of pre-service teachers demonstrate that effective virtual instruction depends not only on digital competence but also on the technological, infrastructural, and environmental conditions that enable meaningful participation. Viewed through Moore's Transactional Distance Theory, these conditions influence the quality of dialogue, flexibility of instructional structure, and degree of autonomy required of teachers and learners. The participants' adaptive responses further illustrate the importance of flexibility and resourcefulness when conventional instructional arrangements are disrupted. However, adaptation should not substitute for adequate institutional support. Teacher education institutions should therefore integrate

context-responsive digital pedagogy into pre-service preparation while strengthening access to reliable technologies and flexible instructional support. Preparing future teachers for technology-mediated education requires both pedagogical competence and institutional conditions that enable equitable and sustained engagement across diverse learning environments.

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