Pre-Service Teachers' Sense of Efficacy, 3D Competencies (Skills, Character, and Meta Learning), and Teaching Performance

Jahfet N. Nabayra*, Clarita R. Tambong, John R. Orbista, Ma. Lourdes I. Ilarde, Sharmaine L. Lava, Ariene R. Ibisate, and Jonah Eliza P. Tordecillas

College of Teacher Education of Aklan State University, Banga, Aklan, Philippines
Email: jnabayra@asu.edu.ph (J.N.N.); clairetambong8@gmail.com (C.R.T.); johnorbista@gmail.com (J.R.O.); lourdesilarde70@gmail.com (M.L.I.I.); sharmaine.lava@asu.edu.ph (S.L.L.); aibisate@asu.edu.ph (A.R.I.); jetordecillas@asu.edu.ph (J.E.P.T.)
*Corresponding author

Manuscript received May 7, 2025; revised June 20, 2025; accepted August 5, 2025; published December 19, 2025

***Abstract*—Adequate teacher professional development is needed to handle the changing teaching demands and fast advancing learning needs of students. This study aimed to investigate the various factors that influence preservice teachers' competency in teaching. Employing a descriptive correlational research design, it investigated the preservice teachers' (PST) sense of efficacy, 3D competencies, and teaching performance. The 3D competencies used in this study are a modified education structure based on the 4D Education Framework by the Center for Curriculum Redesign (CCR). It revolves around three competencies: skills, character, and meta-learning. The sample includes 127 PSTs during the Academic Year 2023–2024. Research instruments employed were the Teachers' Sense of Efficacy Scale, 3D Competency Education Framework Questionnaire, and Teaching Performance Assessment Form, which were verified to be valid and reliable. Mean, standard deviation, frequency count, percentage, and Pearson correlation were used to analyze the data. Results show that the overall sense of efficacy of the PSTs is at a sufficient level, including the key indicators like student engagement, instructional practices, and classroom management. Preservice teachers are highly competent in terms of skills, character, and meta learning competencies. The majority of the PSTs have excellent teaching performance and are at the proficient level in terms of overall performance. To add, findings show that there is a significantly strong positive relationship between the preservice teachers' sense of efficacy and their teaching performance at the 0.05 level of significance, while there is no significant correlation between the PSTs' 3D competencies and their teaching performance. It is concluded that greater confidence and self-belief in teaching lead to better classroom outcomes. Therefore, it is recommended that enhancement programs and targeted interventions should be developed to promote and bolster preservice teachers' teaching confidence and efficacy.**

***Keywords*—preservice teachers, sense of efficacy, teaching performance, meta learning, teacher education**

I. Introduction

As one of the Teacher Education Institutions (TEIs) in the country, the Aklan State University, College of Teacher Education commits to producing competent and quality teachers who have sufficient competencies and a high sense of efficacy, which will consequently manifest in their promising performance in the field. The goal of the college emphasizes the transformation of future educators imbued with positive values for the global village anchored from CHED Memorandum Order No. 74 & 75 series of 2017. Gutierrez & Espique [1] advanced that providing proper and quality teaching and training of would-be teachers is the mandate of teacher education institutions. Hence, they are expected to ensure that the would-be teachers can demonstrate the essential competencies required in various domains to become effective and competent teachers.

Teacher education programs aim to prepare competent teachers, ready to enter and face the typical challenges of beginning teachers. However, many struggle to connect theory and practice [2]. Research suggests beginning teachers tend to struggle with classroom management, assessment, and formulating objectives [2, 3–5].

In the Philippines, Ocampo [6] found out that Pre-Service Teachers (PSTs) were found to use cognitive skills at a high level; however, their use of other skills, such as autonomous skills, collaboration, and flexibility skills to solve real-life issues, is at an intermediate level only. Thus, the use of 21st-century learner abilities should be developed for pre-service teachers to prepare them in the real challenges of the teaching profession. Almazroa & Alotaibi [7] reported that the pedagogical approaches used by today's teachers may not meet the requirements of 21st-century learners, highlighting the importance of upskilling and reskilling teachers in 21st-century skills.

In line with this, the Center for Curriculum Redesign [8] advanced the 4D Education Framework, namely the Knowledge, Skills, Character, and Meta-Learning needed in the 21st century, considering metaverse competencies. Taylor *et al*. [9] conclude that 4D competencies have educational goals beyond just academics. Researchers have observed major changes in education systems that recognize competencies as an important factor. Hence, assessing whether PSTs possess these competencies may help identify gaps and issues in the current teacher preparation programs to better develop the needed competencies in the field.

However, in this study, the researchers focus on only three (3) dimensions. The 3D competencies explored in the study are particularly based on the previously mentioned 4D Education Framework of the Center for Curriculum Redesign (CCR). In contrast to the 4D Education Framework, this study only measured three (3) out of the four (4) dimensions. These are skills, character, and meta-learning. The "knowledge" dimension was not included as a variable in the study due to limitations in resources (e.g., time, availability of assessment tool, and availability of students). Furthermore, assessing PSTs' knowledge means evaluating their

knowledge of all the courses taken in the whole program. A separate assessment about this knowledge dimension is needed, which requires another laborious task; hence, the term 3D competencies (skills, character, and meta learning) was used in this study. Moreover, the 3D competencies examined in this study also implicitly mirror OECD's Transformative Competencies: creating new value, reconciling tensions and dilemmas, and taking responsibility. These three competencies mirror that of the 3D framework: skill dimension resembles creating new value through thinking outside the box, critical thinking, creativity and collaboration; character dimension translates to reconciling tensions and dilemmas where an individual practices open-mindedness and risk-taking; and meta-learning dimension parallels taking responsibility through reflective practices, self-concept, and self-regulation among others [10]. In this study, meta-learning adheres to the definition of the 4D Education framework, which includes metacognition (e.g., reflecting on processes, achievements, learning, and/or identity) and metaemotion (e.g., finding joy in learning and becoming a lifelong learner). Moreover, the congruency of these 3D Competencies to the OECD's Transformative Competencies is presented in Table 1.

Table 1. Alignment of 3D competencies and OECD's transformative competencies

3D Competencies	OECD Transformative Competencies
Skills [creativity (imagination), critical thinking (decision making), communication (dialogue), and collaboration (leadership)]	**Creating new value** [Students need to have a sense of purpose, curiosity and experiences which require critical thinking and creativity in finding different approaches to solving problems, and collaboration with others to find solutions to complex problems]
Character [curiosity (open mindedness), courage (risk taking), resilience (resourcefulness) and ethics (fairness)]	**Reconciling tensions and dilemmas** [Students need first to have cognitive flexibility and open-mindedness skills so that they can see an issue from different points of view and understand how these differing views result in tensions and dilemmas. It can involve making complex and sometimes difficult decisions; therefore, students need to develop a sense of resilience and tolerance for complexity and ambiguity.
Meta-learning [metacognition and metaemotion]	**Taking responsibility** [For this competency, having a sense of self-awareness, self-regulation, and reflective thinking is of particular importance. Taking responsibility requires having a strong moral compass and locus of control.

Meanwhile, cultivating robust teaching self-efficacy is considered an important part of teacher education [11]. Professional experience placement is the first authentic opportunity for preservice teachers (PSTs) to teach in real school contexts and has been claimed as the most vulnerable period for self-efficacy [12]. Van Ooyik *et al*. [13] found that both mentor teachers and university supervisors played a significant role in the growth and development of teaching skills, including pacing lessons, differentiation, and creating engaging activities. Participants in their study had the most confidence and self-efficacy in areas related to instructional strategies and pacing. Another area of growth in confidence and self-efficacy was in classroom management; however, participants wanted more opportunities to practice. In another study, results show that most PSTs reported an increase in their sense of efficacy after completing the placement. Variations in teachers' sense of efficacy in subdomains, including classroom management, student engagement, instruction, and flexibility, were also found. Teacher educators could facilitate PSTs' self-efficacy development by providing extra assistance at the beginning of their placements, especially with their classroom management skills [14].

Furthermore, research has reported that trainee teachers during the practicum period face challenges and/or difficulties in implementing teaching practices they were taught during their studies in teacher education programs [15]. Soleas & Hong [16] found that pre-service teachers who get into the field often become pragmatic and end up abandoning the earlier ideals and expectations that they learned in their program of study. They encountered difficulties when trying innovative teaching strategies they learned in different academic courses. There is a missing connection between subject-matter knowledge, pedagogical competence, and real-life practice in schools. To develop practitioners who can serve all learners, teacher education programs must prepare teacher candidates to enter a wide range of diverse teaching environments [17].

Adequate opportunities for teacher professional development are needed to handle the rapidly changing teaching demands and learning needs of students. Improving teacher education contributes much to the realization of the goals set for the whole educational system [18]. Thus, knowing their competence, sense of efficacy, performance, and pedagogical practices would presumably assist in identifying key issues that will, in turn, facilitate the process of reviewing and enhancing teacher preparation programs.

This study examines preservice teachers' sense of efficacy, 3D competencies, and teaching performance, and the possible relationships that may exist among them. It sought answers to the following questions: (1) What is the level of preservice teachers' sense of efficacy as a whole and in terms of: a. Efficacy in Student Engagement; b. Efficacy in Instructional Practices; and c. Efficacy in Classroom Management? (2) What is the level of 3D competencies of preservice teachers as a whole and in terms of: a. Skills; b. Character, and c. Meta-learning? (3) What is the teaching performance of preservice teachers? (4) Are the preservice teachers' sense of efficacy and level of 3D competencies significantly related to their teaching performance?

Fig. 1 shows the paradigm of the study. The preservice teachers' sense of efficacy and 3D competencies correlate with their teaching performance. Hence, the study sought to assess the PSTs' sense of efficacy, 3D competencies, and teaching performance to evaluate the relationships among the variables involved, as evidenced by the line connecting the variables.

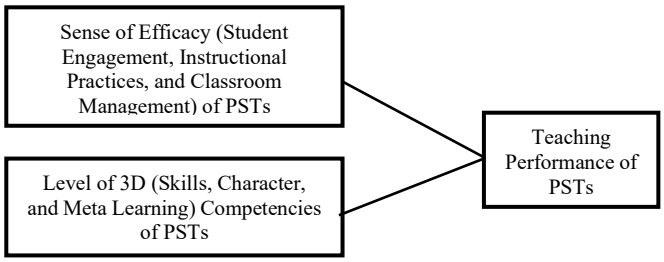

Fig. 1. Paradigm of the study.

II. Methodology

A. Research Design

This study employed descriptive correlational research design. A descriptive correlational design is used to provide static pictures of situations as well as establish the relationship between different variables [19]. This design is suited to this study because the main objectives are to describe the preservice teachers' sense of efficacy, 3D competencies, and teaching performance; and to check relationships among the variables through a correlation analysis.

B. Participants of the Study

This study was conducted in a state university in the province of Aklan in the Philippines. Using the G-power sample calculator, a total of 107 respondents were needed in the study, considering the parameters set on effect size (0.15), data analysis tools, confidence interval (95%), and the nature of the test to be used. The respondents were preservice teachers (PSTs) enrolled during the academic year 2023–2024. The participants were further distributed into the program and specialization as shown in Table 2. By convenience sampling, the questionnaire was administered through Google Forms and gathered 127 responses from the PSTs. The number of responses collected is beyond the required number of samples computed using G-power. Nevertheless, all the responses were utilized to enhance the validity of the results.

Table 2. Distribution of the participants of the study

Program	N	%
Elementary Education	64	50.4%
Secondary Education in English	35	27.6%
Secondary Education in Mathematics	13	10.2%
Secondary Education in Science	10	7.9%
Secondary Education in Social Studies	5	3.9%
TOTAL	**127**	**100%**

The study exclusively involved participants from one state university, which may have provided in-depth data about the PSTs' sense of efficacy, 3D competencies, and teaching competency. However, the sampling technique used may limit the generalizability of the results.

Moreover, the institution's programs and curriculum are broadly aligned with similar Teacher Education Institutions (TEIs) in the region. This allows the results of this study to reflect comparable patterns or trends in other similar settings.

On another note, the results of this study may present information on the unique characteristics of the PSTs in the said university.

C. Instrumentation, Data Collection, and Analysis

In this study, the researchers used three instruments to assess the three variables involved in the study namely: Teachers' Sense of Efficacy Scale to assess the sense of efficacy of preservice teachers, 3D Competency Education Framework Questionnaire to assess the competence of the PSTs regarding the three dimensions (Skills, Character, and Meta Learning), and Teaching Performance Assessment Form to assess the teaching performance of PSTs during final demonstration teaching. All these instruments were carefully validated by experts, and reliability was also ensured. These experts include research, education, and teacher training.

1) Teachers' sense of efficacy scale

This instrument was developed at the Ohio State University; thus, it is sometimes referred to as the Ohio State Teacher Efficacy Scale. This was developed by Tschannen-Moran & Woolfolk Hoy [20], which consists of three major factors, namely: Efficacy in Student Engagement, Efficacy in Instructional Practices, and Efficacy in Classroom Management. This is a 24-item rating scale wherein the students can rate from 1–9, consisting of different statements. This was adopted by researchers due to its high acceptance in the field with valid and reliable tests. To further ensure reliability and validity, the instrument was adopted from an established Teacher's Sense of Efficacy Scale with a reliability value of Cronbach alpha = 0.94 from Ohio State University [20].

To interpret the result of sense of efficacy, the following scale in Table 3 was used based on Atalay [21].

Table 3. Interpretation of sense of efficacy score

Interpretation	Item	Score
Insufficient	1	1.00–1.89
	2	1.90–2.78
	3	2.79–3.67
Moderately Sufficient	4	3.68–4.56
	5	4.57–5.45
	6	5.46–6.34
Sufficient	7	6.35–7.23
	8	7.24–8.12
	9	8.13–9.00

2) 3D (skills, character, meta learning) competency education framework questionnaire

This questionnaire was adopted from the 4D Education Framework Competencies designed by the Center for Curriculum Redesign (2024), but in this study, only three dimensions were assessed, hence the term 3D, consisting of statements coming from Skills, Character, and Meta-learning dimensions. This instrument was composed of 60 statements divided into the three dimensions mentioned above. The skills determined the creativity (imagination), critical thinking (decision making), communication (dialogue), and collaboration (leadership) of the students. Secondly, the Character had curiosity (open-mindedness), courage (risk-taking), resilience (resourcefulness), and ethics (fairness). These are the behaviors identified towards the competency of character. Lastly, meta-learning, metacognition, and meta-emotion were the adaptability of the learners. Pilot test/reliability test results indicated that the instrument may be used and generate reliable results (Cronbach alpha = 0.87). Experts validated the instrument,

and comments and suggestions were applied to improve the effectiveness of the instrument in collecting the target data.

PSTs rated each statement from 1-5 (not competent to very highly competent). To interpret and determine the level of 3D competencies of the PSTs, Table 4 scale was used.

Table 4. Interpretation of 3D competency score

Score	Interpretation
4.50–5.00	Very Highly competent
3.50–4.49	Highly competent
2.50–3.49	Competent
1.50–2.49	Slightly competent
1.00–1.49	Not competent

3) Teaching performance assessment form

The researchers adopted the assessment form used by the college during the final demonstration teaching performance of the PSTs to assess their performance. The assessment form was composed of the following criteria: personality (10%), lesson planning (15%), content (20%), teaching methods (20%), classroom management (15%), and questioning skills (20%). However, it must be considered that the assessment of teaching performance may be subject to observer bias and varied personal opinions of the observers. To minimize this, each criterion in the assessment form had a corresponding rubric and descriptive statements to maximize consistency and objectivity in the evaluation.

The assessment form utilized was adopted from a standardized form used in the university for assessing student teaching performance in the teacher education department.

In addition, the teaching performance level was interpreted based on the following scale in Table 5:

Table 5. Interpretation of teaching performance score

Score	Interpretation
95–100	Excellent
90–94	Proficient
85–89	Satisfactory
80–84	Developing
75–79	Needs improvement

Before gathering data, the researchers secured permission to conduct the study from the Dean of the college, where the participants of this study were enrolled. Letters of consent were distributed and signed by the PSTs as approval to participate in the study.

The survey questionnaires were administered through Google Forms to maximize the number of participants and responses. This is an important factor because the PSTs undergoing practice teaching experience in the various schools in the province, which limits their availability to respond in person. In terms of their teaching performance, grades in their final demonstration teaching were used in the study. PST Supervisors were also interviewed about the grades during the final demonstration teaching, attesting to their performance.

The mean and standard deviation were used to summarize and describe the quantitative data, specifically on the level of sense of efficacy of PSTs and their 3D competencies. In addition, frequency and percentage were used to analyze the teaching performance of the PSTs falling under different categories/levels, ranging from needing improvement to excellent.

Moreover, Pearson's correlation was used to assess the relationship of the variables; specifically, the relationships between sense of efficacy and teaching performance, and between 3D competencies and teaching performance. This parametric tool was used despite the nonprobability nature of the sampling technique employed because the data was normally distributed and at least interval. The interpretation of correlation analysis was based on Table 6 [22].

Table 6. Interpretation of the correlation analysis used by Dancey & Reidy (2004)

R Value	Strength of Correlation
≥ 0.70	"Very strong relationship"
0.40–0.69	"Strong relationship"
0.30–0.39	"Moderate relationship"
0.20–0.29	"Weak relationship"
0.01–0.19	"No or negligible relationship"

III. Results

A. Level of Preservice Teachers' Sense of Efficacy

Table 7 shows that the preservice teachers have a sufficient sense of efficacy in all the indicators of the efficacy scale, namely: student engagement (Mean = 6.72, SD = 2.02), instructional practices (Mean = 6.74, SD = 2.08), and classroom management (Mean = 6.59, SD = 2.04). Overall, the sense of efficacy of the PSTs has a mean rating of 6.68 and an SD of 2.03. This implies that these soon-to-be teachers have a sufficient level of sense of efficacy among themselves. The low standard deviation value signifies homogeneity among the responses of the PSTs.

Moreover, it is also worth noting that instructional practices and student engagement have the highest levels of sense of efficacy, which denotes that PSTs have a strong self-belief that they can engage the students well during class with their relevant and innovative instructional practices.

Table 7. Level of preservice teachers' sense of efficacy as a whole and in terms of student engagement, instructional practices, and classroom management

Indicators	Mean	SD	Description
Efficacy in Student Engagement	6.72	2.02	Sufficient
Efficacy in Instructional Practices	6.74	2.08	Sufficient
Efficacy in Classroom Management	6.59	2.04	Sufficient
Overall Mean	**6.68**	**2.03**	**Sufficient**

Legend: Insufficient (1) 1.00–1.89; (2) 1.90–2.78; (3) 2.79–3.67; Moderately Sufficient (4) 3.68–4.56; (5) 4.57–5.45; (6) 5.46–6.34; Sufficient (7) 6.35–7.23; (8) 7.24–8.12; (9) 8.13–9.00

B. Level of 3D (Skills, Character, and Meta Learning) Competencies of Preservice Teachers

It can be gleaned from Table 8 that the overall 3D competencies of the preservice teachers are highly competent (Mean = 4.01, SD = 0.56). Moreover, PSTs are also highly competent in terms of the three dimensions, namely Skills (Mean = 3.98, SD = 0.13), Character (Mean = 3.99, SD = 0.09), and Meta Learning (Mean = 4.06, SD = 0.17).

In addition, Meta Learning has the highest weighted mean among the three dimensions. This may indicate that PSTs possessed the needed metaverse competencies to thrive in this meta world where everything is interconnected and technology suffused. This is a necessity for PSTs to possess high competence in these three dimensions since they will be dealing with 21st-century learners. On the other hand, skills

dimensions gained the lowest weighted mean among the three dimensions.

Table 8. Level of 3D competencies of preservice teachers as a whole and in terms of skills, character, and meta learning

Competencies	Mean	SD	Description
Skills	3.98	0.13	Highly Competent
Character	3.99	0.09	Highly Competent
Meta Learning	4.06	0.17	Highly Competent
Overall Mean	**4.01**	**0.56**	**Highly Competent**

Legend: (4.50–5.00) Very Highly competent; (3.50–4.49) Highly competent; (2.50–3.49) Competent; (1.50–2.49) Slightly competent; (1.00–1.49) Not competent

C. Teaching Performance of Preservice Teachers

Table 9 displays the teaching performance of the preservice teachers as assessed by the panel of evaluators during their final teaching demonstration using the following criteria: Personality, Lesson planning, Content, Teaching methods, Classroom management, and Questioning skills.

It can be observed from Table 3 that the majority of the PSTs have excellent teaching performance (54 or 42.50%), followed by PSTs that are proficient (41 or 32.30%), satisfactory (17 or 13.40%), while the remaining PSTs are still at a developing level (15 or 11.80%). The overall mean teaching performance is 92.35, which shows that the soon-to-be teachers are proficient in terms of their teaching performance. This attests their readiness to enter the education system because the final demonstration teaching activity is a culmination of all their teacher training activities in the program.

Table 9. Teaching performance of preservice teachers

Performance Score	Interpretation	f	%
95–100	Excellent	54	42.5
90–94	Proficient	41	32.3
85–89	Satisfactory	17	13.4
80–84	Developing	15	11.8
TOTAL		**127**	**100**
Overall Mean – 92.35	**Proficient**		

D. Relationship of Preservice Teachers' Sense of Efficacy and Level of 3D Competencies to their Teaching Performance

Table 10 portrays the relationship among the variables involved in the study. After conducting the correlation analysis through Pearson's r, results showed that there is a significant strong positive relationship between the preservice teachers' sense of efficacy and their teaching performance at .05 level of significance ($r = 0.614$, $p < 0.05$). This implies that a higher sense of efficacy among PSTs may be associated with high teaching performance. The coefficient of determination ($r2$) suggests that 37.70% of the variance in the teaching performance of the PSTs can be attributed to their sense of efficacy. Hence, PSTs' perception of themselves, especially on efficacy, is instrumental to their teaching performance.

On the other hand, there is no significant correlation between the PSTs' 3D competencies and their teaching performance ($r = -0.090$, $p > 0.05$). In addition, the relationship is also negligible and negative. Thus, it can be said that the competence of the PSTs in terms of three dimensions (Skills, Character, and Meta Learning) has nothing to do with their teaching performance. This connotes that PSTs can still perform well in their teaching performance regardless of their level of competence in the 3D competencies as assessed in this study. Moreover, this non-significant relationship finding may be attributed to cultural response tendencies, particularly in self-assessed competencies, which are known to affect correlation results in Southeast Asian populations.

Table 10. Relationship of preservice teachers' sense of efficacy and level of 3d competencies to their teaching performance

Independent variable	Dependent variable	r	p-value
Teaching Performance	Sense of Efficacy	0.614*	0.000
	3D Competency	-0.090^{ns}	0.314

*Note: NS means not significant; * means significant at 0.05 level of significance*

Legend: ≥ 0.70–Very strong relationship; 0.40–0.69–Strong relationship; 0.30–0.39–Moderate relationship; 0.20–0.29–Weak relationship; 0.01–0.19–No or negligible relationship (Dancey & Reidy, 2004)

IV. Discussion

The findings of this study revealed that preservice teachers exhibit a high sense of efficacy, particularly in instructional practices and student engagement. These are well-supported by existing literature. Tschannen-Moran and Woolfolk Hoy [19], through their development of the Teacher Sense of Efficacy Scale (TSES), revealed that preservice teachers consistently report elevated self-efficacy levels, especially in the areas of instructional strategies and engaging students. Hence, PSTs' readiness in teaching students in the 21st century is a necessity [23] to keep them engaged using innovative instructional practices [24]. This reinforces the current study's results, highlighting that PSTs feel confident in crafting effective lessons and in actively involving learners during instruction.

In the same manner, Manowaluilou & Reeve [25] advanced that self-efficacy is a prerequisite for the development of preservice teachers who will go on to teach successfully in their careers. The same findings showed that efficacy scores were significantly higher for pre-service teachers in schools with higher student achievement. This parallel finding strengthens the present study's observation that classroom management, while still sufficient, is perceived as a slightly weaker domain compared to the other two indicators. Hence, it can be inferred that instructional and engagement efficacy are typically among the earliest developed competencies in a teacher's professional journey.

Conversely, Brown *et al*. [26] provide a complementary yet slightly contrasting viewpoint. Their study indicated that although both preparedness and sense of teaching efficacy increased during the practicum phase, only preparedness had a significant relationship with actual classroom performance. This highlights a potential gap between perceived efficacy and observable teaching effectiveness. As such, while the current study confirms that PSTs hold strong beliefs in their teaching capabilities, it is essential to recognize that these beliefs may not always directly correlate with real-world performance outcomes. This calls attention to the importance of not just cultivating efficacy beliefs but also ensuring that these beliefs are grounded in authentic and practical experiences.

The study highlighted that preservice teachers rated themselves highly in terms of their 3D competencies,

particularly in Meta Learning, which encompasses self-regulated learning, adaptability, and digital fluency. This finding is consistent with Redecker [27], who, through the European Framework for the Digital Competence of Educators (DigCompEdu), underscores the importance of digital competencies, reflective practice, and self-regulated learning as foundational components of effective teaching in digitally mediated and interconnected learning environments. Similarly, the use of 21st-century learner abilities should be developed for pre-service teachers to prepare them for the real challenges of the teaching profession [6]. Together, these studies reinforce the idea that PSTs must possess strong meta-learning abilities to thrive in the evolving educational landscape where technology is ubiquitous [28–31].

However, contrasting perspectives are also evident. Tondeur *et al*. [32] conducted a study on the digital competencies of future teachers and revealed notable discrepancies between self-reported competence and actual performance, particularly in domains requiring deeper self-regulation and integration of technology. This contrast suggests that while PSTs may perceive themselves as highly competent in Meta Learning, such perceptions may not always reflect actual readiness or application. Thus, the high ratings in this dimension should be interpreted with caution, and future assessments may benefit from including performance-based evaluations to validate self-reported data.

The findings of this study, which revealed that most preservice teachers performed at proficient to excellent levels during their final demonstration teaching, are well supported by prior research. For instance, Sutirna & Intisari [33] found that preservice teachers generally excelled in personality, learning, lesson planning, and micro-teaching. These areas align with the current study's evaluation criteria, thereby reinforcing the idea that structured, competency-based training significantly contributes to high teaching performance. Moreover, teachers' teaching ability is one of the most important ability factors affecting students' academic achievement [34].

In addition, preservice teachers who are exposed to a variety of professional learning programs and informal learning experiences throughout their training [35] and those who experienced reflective practice in their respective programs [36] often exhibit strong readiness indicators during culminating assessments such as demonstration teaching. Thus, the findings of the present study affirm that the final teaching demonstration serves as an effective and comprehensive measure of the skills, knowledge, and dispositions developed by PSTs over the course of their teacher preparation program.

Results revealed a significantly strong positive relationship between preservice teachers' sense of efficacy and their teaching performance. This is consistent with the findings of Bantoc and Yazon [37], who underscored the positive association between teacher efficacy and performance-related outcomes, asserting that educators' beliefs in their capabilities significantly drive their motivation and overall effectiveness in the classroom.

However, Klassen and Tze [38] found only moderate correlations between self-efficacy and performance, suggesting that factors like school environment, mentorship, and support systems influence how strongly self-efficacy translates into effective teaching. Moreover, Brown *et al*. [39] also found that teaching performance does not correlate with teaching efficacy (only with feelings of preparedness). There were also consistencies found between pre-service teachers' self-efficacy perspectives and their teachers' evaluation of their teaching competence [40]. This highlights that self-efficacy's impact may vary with context. On the other hand, the current study found no significant correlation between preservice teachers' 3D competencies (Skills, Character, and Meta Learning) and their teaching performance, which contradicts several existing studies on 21st-century teaching skills. The null findings may be attributed to limitations in methodological factors, such as the sensitivity of instruments to the variations present among respondents and the potential bias among both participants and observers during the evaluation and the administration of the questionnaires. Since the instrument was fully adopted, the null findings may have been due to how the participants responded to a foreign-based instrument, which may be affected by the context of the participants. Nonetheless, this finding may be explained by the observations of Bani-Amer [41], who reported that student teachers perceive they have developed 21st-century competencies, but struggle to apply them in the classroom. Along the same lines, Tondeur *et al*. [32] highlighted a noticeable gap between self-assessed digital and meta-learning competencies and actual classroom practices. Furthermore, Padagas [42] also writes that pre-service teachers' competencies in teaching, assessment, and classroom management are not always related to their skills, character, and meta-learning abilities. Similarly, opportunities to learn and gain skills and various abilities do not always translate to pre-service teachers' competence in teaching [43]. This disconnect may account for the weak or even negative correlation identified in this study, implying that competence in these areas does not automatically translate to high teaching performance without adequate application and experience.

V. Conclusion and Recommendations

Based on the findings of this study, it was concluded that preservice teachers demonstrate a sufficient level of sense of efficacy, specifically in instructional practices and student engagement. This indicates strong self-belief in their ability to foster student engagement and implement innovative teaching strategies.

Moreover, the preservice teachers express high competence in the 3D competency dimensions—Skills, Character, and Meta Learning. This highlights the participants' preparedness for the varied demands of 21st-century education, especially in navigating modern and technology-driven learning environments. Both results signify their readiness to transition into the professional teaching environment.

In addition, a strong positive correlation exists between preservice teachers' sense of efficacy and their teaching performance, indicating that confidence and higher self-belief in teaching abilities contribute to better classroom performance, a key predictor of successful classroom teaching.

However, no significant relationship was revealed between preservice teachers' 3D (skills, character, and meta learning)

competencies and their teaching performance, suggesting that their skills, character, and meta-learning abilities are not immediately observable during a single performance task and therefore do not immediately impact their demonstrated teaching capabilities. These competencies may be observed in subtle, delayed, or long-term ways, such as real-world and sustained teaching practice. Moreover, mapping theoretically, the alignment of 3D competencies to OECD transformative competencies may be considered since these two frameworks are highly comparable. Thus, this result opens the possibility of conducting further investigation considering the latter framework.

With these conclusions, it is recommended that enhancement programs and targeted interventions should be developed to promote and bolster preservice teachers' teaching confidence and efficacy, especially among those identified as having lower teaching performance.

It is also recommended that further investigations be conducted on the role of 3D competencies in actual classroom teaching performance using a qualitative research methodology on a focus group to explore alternative connections between these 3D competencies and effective teaching.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

All authors have contributed their share for the completion of this paper. The following are their respective contributions. J.N.N. did the analysis of the data, C.R.T. and M.I.I. both helped in the gathering of data, J.R.O. and S. L. L. led the write-ups of the manuscript, J.P.T. supervised the preparation of the research proposal and conceptualization of the study, and A.R.I. participated in data gathering and the finalization of the manuscript. All authors had approved the final version.

ACKNOWLEDGMENT

The authors would like to express their heartfelt gratitude to the Aklan State University Research and Development Services Unit, the College of Teacher Education, and the administration for their unyielding support to the research endeavors of the researchers.

REFERENCES

[1] J. Gutierrez and F. Espique, "Competencies of pre-service language teachers: Towards developing a language training program," *Philippine Educ. Res. J.*, no. 1–2, pp. 11–28, 2020.

[2] M. M. Lew and R. F. Nelson, "New teachers' challenges: How culturally responsive teaching, classroom management, & assessment literacy are intertwined," *Multicult. Educ*., vol. 23, no. 3, pp. 7–13, 2016.

[3] L. M. Daniels and C. A. Poth, "Relationships between pre-service teachers' conceptions of assessment, approaches to assessment, approaches to instruction, and assessment: An achievement goal theory perspective," *Educ. Psychol*., vol. 37, no. 7, pp. 835–853, 2017.

[4] R. Junker, B. Gold, and M. Holodynski, "Classroom management of pre-service and beginning teachers: From dispositions to performance," *Int. J. Mod. Educ. Stud*., vol. 5, no. 2, 2021. https://doi.org/10.51383/ijonmes.2021.137

[5] C. Shaham, "Training for teaching—Reflective observation of beginning teachers in their first year," *Curric. Teach*., vol. 37, no. 1, pp. 79–99, 2022. https://doi.org/10.7459/ct/37.1.05

[6] D. Ocampo, "21st pedagogical competence of pre-service teachers in the new normal modalities," *Globus J. Prog. Educ*., vol. 11, no. 1, 2021. doi: 10.46360/globus.edu.220211014

[7] H. Almazroa and W. Alotaibi, "Teaching 21st century skills: Understanding the depth and width of the challenges to shape proactive teacher education programmes," *Sustainability*, vol. 15, no. 9, 7365, 2023. https://doi.org/10.3390/su15097365

[8] Center for Curriculum Redesign. (Jan. 2024). 4D competencies framework. [Online]. Available: https://curriculumredesign.org/our-work/4d-competencies-framework

[9] R. Taylor, C. Fadel, H. Kim, and E. Care. (Oct. 2020). Competencies for the 21st century: Jurisdictional progress. [Online]. Available: https://www.researchgate.net/profile/Helyn-Kim/publication/346322932_Competencies_for_the_21st_century_Jurisdictional_progress/links/5fbe5fc392851c933f58f8bf/Competencies-for-the-21st-century-Jurisdictional-progress.pdf

[10] OECD. (2030). Transformative competencies for 2030 conceptual learning framework. [Online]. Available: https://www.oecd.org/content/dam/oecd/en/about/projects/edu/education-2040/concept-notes/Transformative_Competencies_for_2030_concept_note.pdf

[11] R. M. Klassen and T. L. Durksen, "Weekly self-efficacy and work stress during the teaching practicum: A mixed methods study," *Learn. Instr.*, vol. 33, pp. 158–169, 2014. https://doi.org/10.1016/j.learninstruc.2014.05.003

[12] L. Hasselquist, K. Herndon, and T. Kitchel, "School culture's influence on beginning agriculture teachers' job satisfaction and teacher self-efficacy," *J. Agric. Educ*., vol. 58, pp. 267–279, 2017. https://doi.org/10.5032/jae.2017.01267

[13] J. Van Ooyik, J. Lerner, and R. T. Pitts, "The development of preservice teaching competencies," *Educ. Res., Theory Pract*., vol. 32, no. 1, pp. 8–12, 2021.

[14] K. Ma, M. S. Cavanagh, and A. McMaugh, "Preservice teachers' reflections on their teaching self-efficacy changes for the first professional experience placement," *Aust. J. Teach. Educ*., vol. 46, no. 10, 2021. https://ro.ecu.edu.au/ajte/vol46/iss10/4

[15] K. Uibu, A. Salo, A. Ugaste, and H. Rasku-Puttonen, "Beliefs about teaching held by student teachers and school-based teacher educators," *Teach. Teach. Educ*., vol. 63, pp. 396–404, 2017.

[16] E. K. Soleas and J. Hong, "The school of hard knocks: Pre-service teachers' mindset and motivational changes during their practicum," *Foro Educ*., vol. 18, no. 2, pp. 237–257, 2020. https://doi.org/10.14516/fde.726

[17] V. Johnston and D. Collum, "A multi-university: Use of sim school to increase pre-service and in-service teachers' understanding of the use of differentiated instruction and the understanding of classroom management and behavior," in *Proc. Soc. Inf. Technol. Teach. Educ. Int. Conf.*, 2018, pp. 1550–1556.

[18] R. Padagas, "Pre-service teachers' competencies in a work-based learning environment," *Afr. Educ. Res. J.*, vol. 7, no. 3, pp. 130–142, 2019. doi: 10.30918/AERJ.73.18.076

[19] D. McBurney and T. White, *Research Methods*, New York, NY, USA: Cengage Learning, 2009.

[20] M. Tschannen-Moran and A. Woolfolk Hoy, "Teacher efficacy: Capturing and elusive construct," *Teach. Teach. Educ*., vol. 17, pp. 783–805, 2001.

[21] T. Atalay, "Learning styles and teacher efficacy among prospective teachers based on diverse variables," *Int. J. Eval. Res. Educ. (IJERE)*, vol. 8, no. 3, pp. 484–494, 2019. doi: 10.11591/ijere.v8i3.19609

[22] C. Dancey and J. Reidy, *Statistics without Maths for Psychology: Using SPSS for Windows*, London, U.K.: Prentice Hall, 2004.

[23] J. Nabayra and C. Tambong, "Readiness level, satisfaction indicators, and overall satisfaction towards flexible learning through the lens of public university teacher education students," *Int. J. Inf. Educ. Technol.*, vol. 13, no. 8, pp. 1230–1241, 2023. https://www.ijiet.org/show-191-2530-1.html

[24] J. Nabayra, "Teacher-made videos as learning tool in elementary statistics during the pandemic: A developmental research," *Int. J. Inf. Educ. Technol*., vol. 13, no. 1, 2023. doi: 10.18178/ijet.2023.13.1.1774

[25] N. Manowaluilou and E. M. Reeve, "Pre-service teachers' self-efficacy support systems resulting in a desire to become teachers," *International Education Studies*, 2022.

[26] A. Brown, J. Myers, and D. Collins, "How pre-service teachers' sense of teaching efficacy and preparedness to teach impact performance during student teaching," *Educ. Stud*., vol. 47, no. 1, pp. 38–58, 2019. doi: 10.1080/03055698.2019.1651696

[27] C. Redecker, "European framework for the digital competence of educators: DigCompEdu," Publications Office of the European Union, 2017.

[28] R. G. Sagge and S. P. Bacio, "Video explainer, e-module, or both: which is better to improve statistics performance of graduate students?" *Int. J. Eval. Res. Educ. (IJERE)*, vol. 13, no. 5, pp.

3194–3204, 2024. https://doi.org/10.11591/ijere.v13i5.28945
[29] R. Sagge and R. Segura, "Designing and developing video lessons in mathematics using code-switching: A design-based research," *Int. J. Inf. Educ. Technol.*, vol. 13, no. 9, pp. 1391–1398, 2023.
[30] P. Torion and S. Bacio, "Video lessons for the course introduction to computing through online/offline mode (ICOM): Its development and evaluation," *Int. J. Inf. Educ. Technol*., vol. 14, no. 6, pp. 845–855, 2024.
[31] J. Nabayra, "On-the-go Android-based learning tool for mathematics in geographically challenged areas," *Int. J. Learn., Teach. Educ. Res*., vol. 23, no. 8, 2024.
[32] J. Tondeur, J. Braak, P. A. Ertmer, and A. Ottenbreit-Leftwich, "Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence," *Educ. Technol. Res. Develop*., vol. 65, no. 3, pp. 555–575, 2017. https://doi.org/10.1007/s11423-016-9481-2
[33] Sutirna and Intisari, "Analysis of pre-service teacher abilities in professional training program on aspects of personality, learning, micro-teaching, and lesson plan development," *Int. J. Learn. Instr. (IJLI)*, vol. 5, no. 2, pp. 45–56, 2023. https://doi.org/10.26418/ijli.v5i2.58259
[34] M. J. N. Nalipay, I. G. Mordeno, B. Semilla, Jr. *et al*., "Implicit beliefs about teaching ability, teacher emotions, and teaching satisfaction," *Asia-Pacific Edu Res*, vol. 28, pp. 313–325, 2019. https://doi.org/10.1007/s40299-019-00467-z
[35] M. Rif'attullah and D. S. Ciptaningrum, "Exploring pre-service teacher professional learning on their preparedness for teaching practicum," *Formosa J. Sustain. Res*., vol. 3, no. 8, pp. 1779–1798, 2024. https://doi.org/10.55927/fjsr.v3i8.10969
[36] L. B. Liu and N. B. Milman, "Preparing teacher candidates to teach diverse student populations through reflective practice," *Reflective Pract*., vol. 11, no. 5, pp. 619–630, 2010. https://doi.org/10.1080/14623943.2010.516973
[37] A. A. Bantoc and A. D. Yazon, "Self-efficacy, core behavioral competence and performance of teachers: A scaffold for proficient and highly proficient teachers," *Int. J. Multidiscip*., vol. 4, no. 12, pp. 4530–4555, 2023. https://doi.org/10.11594/ijmaber.04.12.28
[38] R. M. Klassen and V. M. C. Tze, "Teachers' self-efficacy, personality, and teaching effectiveness: A meta-analysis," *Educ. Res. Rev*., vol. 12, pp. 59–76, 2014. https://doi.org/10.1016/j.edurev.2014.06.001
[39] A. L. Brown, J. Myers, and D. Collins, "How pre-service teachers' sense of teaching efficacy and preparedness to teach impact performance during student teaching," *Educ. Stud*., vol. 47, no. 1, pp. 1–21, 2019. https://doi.org/10.1080/03055698.2019.1651696
[40] Ö. Çakır and D. Alıcı, "Seeing self as others see you: variability in self-efficacy ratings in student teaching," *Teach. Teach*., vol. 15, no. 5, pp. 541–561, 2009. https://doi.org/10.1080/13540600903139555
[41] M. A. Bani-Amer, "Student teachers' perceptions of their development of 21st century competencies," *Int. J. Res. Educ. Sci*., vol. 8, no. 4, pp. 713–727, 2022. https://doi.org/10.46328/ijres.2948
[42] R. Padagas, "Pre-service teachers' competencies in a work-based learning environment," *Afr. Educ. Res. J*., vol. 7, no. 3, pp. 130–142, 2019. https://doi.org/10.30918/aerj.73.18.076
[43] X. Yang, J. Deng, X. Sun, and G. Kaiser, "The relationship between opportunities to learn in teacher education and Chinese preservice teachers' professional competence," *J. Curric. Stud*., pp. 1–19, 2024. https://doi.org/10.1080/00220272.2024.2334944