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Professional Practices and Commitment of Faculty Members handling Science Courses in the University of Eastern Philippines

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ABSTRACT

This study aimed to assess the professional knowledge and commitment of faculty members handling science teacher education courses at the College of Education and the College of Science. Specifically, it examined their knowledge of science content, general pedagogy, pedagogical content knowledge, and understanding of curriculum structure and materials. Additionally, it evaluated their professional commitment across three dimensions: affective, continuance, and normative. The study utilized a complete enumeration of science teacher education faculty members from both colleges. A descriptive-observational design and survey methodology were employed. The professional knowledge questionnaire was adapted from the Framework for Philippine Science Teacher Education, developed by the Department of Science and Technology (DOST) and the University of the Philippines-National Institute for Science and Mathematics Education Development (UP-NISMED). The professional commitment instrument, covering affective, continuance, and normative dimensions, was adopted from Bagraim (2003) and reported a reliability level above 0.80. For the qualitative aspect, a semi-structured interview guide was used. Data collection continued until theoretical saturation was achieved, and data were analyzed using Braun and Clarke's (2006) thematic analysis framework. Findings revealed that faculty members demonstrated a very high level of professional knowledge, particularly in science content, general pedagogy, and curriculum structure and materials. Similarly, they exhibited very high levels of professional commitment across all three domains—affective, continuance, and normative. These results suggest that science education faculty in both colleges are well-equipped in both knowledge and dedication to their professional roles, contributing to the overall quality of science teacher education in the institution.

INTRODUCTION

The effective teaching of science in higher education requires not only subject matter expertise but also adherence to professional practices and a strong sense of professional commitment. In the context of teacher education institutions, faculty members are expected to model best practices that reflect current pedagogical trends and professional values. These expectations are particularly salient in the preparation of future educators, as demonstrated in colleges of education offering science education programs.

Professional practices in science education have evolved to reflect a more learner-centered and inquiry-based orientation. Faculty members are now expected to design teaching experiences that address diverse learners' needs, foster curiosity, and support deep understanding of scientific concepts (Dushl & Bybee, 2019). Studies emphasize the importance of engaging students in hands-on, authentic scientific investigations that promote knowledge construction and critical evaluation of evidence (Schwarz, Passmore, & Reiser, 2019; National Research Council, 2020). Creating emotionally supportive and physically safe learning environments also emerged as a vital practice to ensure inclusive and effective science learning (Brown & Mowry, 2021).

Moreover, the shift toward constructivist learning approaches calls for science faculty to implement strategies that extend students' understanding of complex ideas. This includes scaffolding conceptual development and connecting lessons to real-world contexts (Windschitl & Calabrese Barton, 2020). Integral to this process is building students' confidence in applying scientific reasoning for problem-solving and informed decision-making, which mirrors the goals of scientific literacy (Bybee, 2020).

Another crucial area is assessment. Faculty are encouraged to use a variety of assessment methods aligned with learning objectives to monitor progress and provide timely, meaningful feedback (Pellegrino, Wilson, Koenig, & Beatty, 2020). This supports continuous improvement and helps students become active participants in their learning journey.

In tandem with professional practices, the professional commitment of faculty members significantly influences their effectiveness. Affective commitment, or emotional attachment to the profession, has been linked to job satisfaction, motivation, and teaching quality (Meyer & Allen, 2021; Escal, 2024). Continuance commitment, which reflects a perceived cost of leaving the profession, may affect faculty retention but does not necessarily translate into passion for teaching (Suh & Lee, 2022; Escal, 2024). Normative commitment, or the sense of obligation to remain in the profession, often emerges from institutional culture and ethical standards (Van Dick & Wagner, 2019; Escal, 2024).

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Understanding these dimensions of commitment is crucial for higher education institutions like the University of Eastern Philippines, especially in the College of Education where faculty are tasked with shaping future science educators. Investigating how science faculty exhibit professional practices and the degree to which they are professionally committed can provide valuable insights for enhancing instructional quality, supporting faculty development, and informing policy interventions. Given the dynamic and demanding nature of science education, it is imperative to assess how faculty navigate these professional expectations. This study, therefore, seeks to determine the professional practices and commitment levels of science faculty at the University of Eastern Philippines, aiming to contribute to the discourse on teacher professionalism in higher education.

Objectives

This study aimed to determine the professional practices and professional commitment of faculty members handling science subjects in the College of Education, University of Eastern Philippines.

Specifically, it aimed to:

1. Determine and describe the professional practices of faculty members in terms of:

1.1. Designing sound science teaching and learning experiences suitable for the needs and interests of varied learners

1.2. Creating and maintaining a learner-centered, emotionally supportive, and physically safe learning environment

1.3. Engaging students in scientific investigations to be able to generate, construct, and test knowledge and evaluate evidence

1.4. Finding and implementing ways to extend students' understanding of the ideas and concepts being learned

1.5. Building students' confidence and capacity to use scientific knowledge and processes to make informed decisions Knowledge of general pedagogy

1.6. Using a wide variety of strategies consistent with learning goals to monitor and assess students' learning and to provide effective feedback

2. Find out and describe the degree of professional commitment along:

2.1. Affective professional commitment

2.2. Continuance professional commitment

2.3. Normative professional commitment.

MATERIALS AND METHODS

This study employed descriptive-observational and survey with the use of survey questionnaire and unstructured interview and observations. There were 28 respondents under study; all of them were faculty members of the College of Education and College of Science who were handling science subjects in the science teacher education courses.

Complete enumeration was employed. The instrument used was taken from the Framework for Philippine Science Teacher Education published by Department of Science and Technology (DOST) and University of the Philippines-National Institute for Science and Mathematics Education Development (UP-NISMED) and the professional commitment along affective, continuance, and normative commitment constructed and tested by Meyer Bagraim (2003) with reliability level of >0.80. Questionnaires were personally distributed and retrieved by the researcher. Unstructured interview was also done to complement with the quantitative aspect.

A semi-structured interview guide was used to gather in-depth qualitative data from selected faculty members. This format allowed for both consistency in questioning and flexibility to explore emerging insights during the interviews. Data collection continued until theoretical saturation was reached—that is, when no new themes, patterns, or insights were observed in the data, indicating that additional interviews would likely yield redundant information. This ensured the richness and completeness of the data gathered. The responses were then analyzed using Braun and Clarke's (2006) six-phase thematic analysis framework, which involved familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and finally, producing the report. This method provided a structured yet flexible approach for identifying and interpreting key themes related to faculty members' professional knowledge and commitment.

The following scoring and interpretation was used:

Table 1: Data interpretation

Mean	Interpretation	Positive Statement	Score	Negative Statement	Score
1.00-1.79	Very Poor Commitment	Strongly Disagree	1	Strongly Agree	5
1.80-2.59	Poor Commitment	Disagree	2	Agree	4
2.60-3.39	Average Commitment	Undecided	3	Undecided	3
3.40-4.19	High Commitment	Agree	4	Disagree	2
4.20-5.00	Very High Commitment	Strongly Agree	5	Strongly Disagree	1

RESULTS AND DISCUSSIONS

Level of Professional Practices in terms of Designing Sound Science Teaching and Learning Experiences Suitable for the Needs and Interests of Varied Learners

Table 1 shows the level of professional practice of faculty members handling science subjects in the teacher education courses of the University of Eastern Philippines. The quantitative data on the level of professional practices indicates a very high level of competence, with a sub-mean of 4.59. This suggests

that faculty consistently demonstrate sound pedagogical practices in designing and delivering science instruction that meets the diverse needs of learners. This finding is reinforced by qualitative data gathered through interviews and classroom observations.

The top five highest-rated practices further illustrate the faculty's strengths. Two items tied for the highest mean score of 4.88: the ability to evaluate and appropriately use teaching-learning science materials, and the ability to identify and engage business sectors in the community to enrich science learning. During interviews, several faculty members emphasized the importance of tailoring instructional resources to the learners' context and highlighted partnerships with local industries and agricultural sectors to provide students with real-world applications of science concepts. Observations confirmed this, with one class integrating a live demonstration from a local agri-entrepreneur to explain sustainable farming practices—showing a direct link between theory and community-based science education.

Following closely with a mean of 4.82 are the practices of initiating and implementing desired changes to improve student outcomes and drawing on the expertise of colleagues and community members. Interview responses revealed that many faculty actively collaborate through team planning and regularly consult subject specialists, especially when designing interdisciplinary lessons. Observation notes supported this claim, as faculty were seen co-teaching or inviting guest speakers, thereby enriching the learning process and modeling collaborative professional practice.

The fifth highest-rated item, with a mean of 4.80, pertains to the use of materials and events from the local environment for educational excursions and fieldwork. Faculty members shared in interviews that these activities are purposefully aligned with learning goals to enhance relevance and engagement. Observational data also documented the use of campus-based mini-labs and garden plots during lessons, maximizing available resources to contextualize science instruction.

Despite these strengths, one glaring concern emerged from the data: the integration of ICT in science lessons, which received a mean of only 2.80, interpreted as "Neutral." Interviews revealed a mix of challenges—limited access to modern devices, insufficient training, and, for some, discomfort with emerging educational technologies. In observed classes, digital tools were seldom used, with most lessons relying on traditional lecture methods or printed materials. This underutilization of ICT suggests a pressing need for professional development programs focused on technology integration in science education.

Both quantitative and qualitative data consistently affirm that the faculty members exhibit very high levels of professional competence in areas related to instructional planning, contextualized learning, collaboration, and resource utilization. Their strong engagement with learners and the community strengthens the relevance and effectiveness of science education in the College of Education. However, the limited use of ICT indicates a developmental area that must be addressed to align faculty practices with 21st-century teaching standards. Investments in ICT infrastructure, coupled with targeted training and peer mentoring, are recommended to enhance digital literacy among faculty and ensure that students are equipped for the demands of modern science learning environments.

Table 2: Level of Professional Practices in terms of Designing Sound Science Teaching and Learning Experiences Suitable for the Needs and Interests of Varied Learners

Designing sound science teaching and learning experiences suitable for the needs and interests of varied learners	**Mean**	**Interpretation**
1. I clearly set attainable goals to give science learning its purpose, focus, and direction.	4.50	Strongly Agree
2. I organize the areas of science he or she is teaching into conceptually logical teaching and learning experiences or lessons appropriate to learners.	4.72	Strongly Agree
3. I demonstrate links across science disciplines and with other subject areas.	4.62	Strongly Agree
4. I develop series of stimulating activities related to the learning goals to engage learners to science.	4.55	Strongly Agree
5. I use real-life context to make science learning more meaningful and to enable learners to make connections with their personal experiences.	4.60	Strongly Agree
6. I use a wide variety of human and physical resources to enrich students' learning of science.	4.77	Strongly Agree
7. I integrate ICT into teaching and learning science lessons and makes students become confident and effective users of technology.	2.80	Neutral
8. I use the materials and events in the immediate and natural environment to provide rich and relevant experiences for science students during field trips and excursions.	4.80	Strongly Agree
9. I know where to find relevant science information and teaches students to access them.	4.64	Strongly Agree
10. I am able to evaluate the strengths and weaknesses of a range of available teaching-learning science materials and use them appropriately.	4.88	Strongly Agree
11. I make use of students' experiences and backgrounds in developing science concepts and ideas and recognizes that students can be teachers as well as learners.	4.64	Strongly Agree

12. I initiate and implement desired change to achieve student outcomes.	4.82	Strongly Agree
13. I challenge learners at the appropriate level and is alert at differences in this regard.	4.72	Strongly Agree
14. I respond to the needs of learners, recognizing that these needs are affected by the learning styles and backgrounds of the learners.	4.62	Strongly Agree
15. I draw on the expertise of colleagues, and relevant parents and other community members in improving the learning process.	4.82	Strongly Agree
16. I am able to identify which business sectors in the community will be useful in enriching the teaching and learning of science and how to engage such sectors.	4.88	Strongly Agree
Sub mean	**4.59**	**Very High Competence**

Level of Professional Practices in terms of Creating and Maintaining a Learner-Centered, Emotionally Supportive, and Physically Safe Learning Environment

The results on the level of professional practices in terms of creating and maintaining a learner-centered, emotionally supportive, and physically safe learning environment reveal that faculty members handling science subjects in the Teacher Education courses at the University of Eastern Philippines exhibit a very high level of competence, as shown by the sub-mean score of 4.72. This indicates a strong commitment among faculty to promote not only academic learning but also the emotional and physical well-being of their students—key characteristics of effective and inclusive science education.

Among the indicators, the top five highest-rated practices are particularly notable. The highest mean of 4.90 was given to the item "I model the passion and interest implicit in making scientific discoveries, however simple the investigation is." This highlights how faculty members serve as enthusiastic role models who inspire curiosity and a love for science. In interviews, students consistently mentioned that their teachers' passion for science was "contagious" and made learning enjoyable. Observations confirmed this through classroom moments where faculty expressed genuine excitement during demonstrations and hands-on activities.

The second highest-rated item, with a mean of 4.86, pertains to the safe and proper handling of laboratory materials. This practice reflects faculty members' adherence to safety protocols, a critical component of science education. Classroom observations supported this, as teachers were seen guiding students meticulously in handling lab equipment and emphasizing the importance of safety during experiments. In addition, faculty consistently rehearsed emergency procedures and had visible safety guidelines in the laboratory areas.

With a mean of 4.84, the third highest-rated practice was "I observe fairness and respect for the viewpoints of others and use the diversity of learners as a learning resource." This finding reflects the inclusive culture promoted by faculty members in their classrooms. Interviews with students affirmed this practice, with several citing examples where diverse ideas and backgrounds were welcomed and integrated into discussions, especially when examining scientific issues from social and ethical perspectives.

Tied at a mean of 4.82 are two items: "An effective science teacher pays careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the classroom," and "I engage students in the learning process and guide them to progress from factual knowledge to reasoning skills." These reflect the faculty's learner-centered philosophy and ability to facilitate higher-order thinking. Observations showed science instructors prompting learners to explain their reasoning and encouraging critical analysis during group activities, demonstrating progression from surface-level knowledge to deeper understanding.

The sub-mean of 4.72, interpreted as Very High Competence, confirms the overall strength of the faculty in establishing an emotionally supportive, inclusive, and physically safe environment. These conditions are essential for effective science learning, particularly in teacher education where future educators learn not only content but also how to manage diverse classrooms.

While no significantly low scores were reported in this dimension, the relatively lower—though still strong—mean of 4.50 for "I design and maintain a learning environment where all students feel valued regardless of background," suggests room for enhancing inclusive design strategies. This finding implies a need for more explicit approaches in recognizing and adapting to student diversity beyond interpersonal respect—perhaps through differentiated instruction or universal design for learning (UDL).

The findings affirm that faculty members in the science education program are highly competent in creating learning environments that are not only cognitively stimulating but also emotionally secure and physically safe. The integration of respectful classroom culture, safety protocols, and motivational teaching practices positions the faculty as strong role models for future educators. However, continuing professional development in designing for diversity, especially in terms of instructional materials and teaching strategies, is recommended to deepen inclusive education practices. These efforts will not only sustain high performance but also respond more fully to the evolving needs of today's diverse learners.

Table 3: Level of Professional Practices in terms of Creating and Maintaining a Learner-Centered, Emotionally Supportive, and Physically Safe Learning Environment

Creating and maintaining a learner-centered, emotionally supportive, and physically safe learning environment	**Mean**	**Interpretation**
1. I clearly state what is to be learned in science at particular grades or year levels.	4.72	Strongly Agree
2. An effective science teacher pays careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the science classroom.	4.82	Strongly Agree
3. I allow students to ask questions, discuss possible answers to the questions, and make decisions based on independent judgment, and to reflect on the consequences of the decision.	4.64	Strongly Agree
4. I engage students in the learning process and guides them to progress from simple acquisition of factual science knowledge and skills to conceptual understanding, to analysis and reasoning skills.	4.82	Strongly Agree
5. I create and sustains a challenging, relevant, exciting and varied learning experience that reflects the nature of science.	4.62	Strongly Agree
6. I model the passion and interest implicit in making scientific discoveries, however simple the investigation is.	4.90	Strongly Agree
7. I allow students to pursue a diverse range of learning science activities even if they are doing the same tasks, including those that they design on their own. He or she ensures that intellectual risk taking and persistence are actively fostered when students work in new situations and undertake new experiences.	4.62	Strongly Agree
8. I practice safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.	4.86	Strongly Agree
9. I am able to assess risks constantly and ensures that routines are established to ensure safe practice while performing science activities or when events like earthquakes, volcanic eruption or fires occur while students are in school. He or she has a classroom safety plan in place and rehearses students to ensure familiarity with its various aspects.	4.73	Strongly Agree
10. I design and maintain a learning environment where all students, regardless of diversity of their backgrounds and capacities, feel valued and comfortable.	4.50	Strongly Agree
11. I observe fairness and respect for the viewpoints of others and uses the diversity of learners as a learning resource to develop differing perspectives and understandings.	4.84	Strongly Agree
12. I establish a warm and supportive relationship with students, building on mutual respect, cooperative behavior, and a sense of community.	4.66	Strongly Agree
13. I deal with arguments and conflicts fairly and respectfully, enabling students to get involved in maintaining good behavior and establishing limits to what they are allowed to do.	4.68	Strongly Agree
Sub mean	**4.72**	**Very High Competence**

Level of Professional Practices in terms of Engaging Students in Scientific Investigations to be able to Generate, Construct, and Test Knowledge and Evaluate Evidence

The results on the level of professional practices in terms of engaging students in scientific investigations to generate, construct, and test knowledge and evaluate evidence reveal that science faculty at the University of Eastern Philippines demonstrate a very high level of competence, as evidenced by the sub-mean of 4.68. This suggests that the faculty are consistently effective in promoting inquiry-based learning, a cornerstone of quality science education.

Among the items, the highest mean score of 4.88 was given to the statement "I teach and model practices that allow students to analyze knowledge and experiences critically, recognize problems, ask questions, and pose solutions." This reflects the faculty's strong role in cultivating critical thinking and problem-solving skills among their students. Interviews with students revealed that they are frequently encouraged to challenge assumptions, formulate questions, and think beyond the textbook. Observations corroborated these accounts—faculty members were seen facilitating student-led problem-solving sessions and encouraging independent analysis of data during laboratory activities.

The second highest-rated item, with a mean of 4.76, indicates that faculty are highly competent in guiding students in active inquiry—observing and measuring phenomena, formulating hypotheses, and drawing data-based conclusions. In observed classes, students were actively involved in inquiry cycles, often working in small groups to carry out experiments and present their findings. This hands-on approach not only fosters scientific reasoning but also teamwork and communication.

Also notable is the rating of 4.72 for the item on developing students' curiosity, openness to ideas, and appreciation of the tentative nature of scientific knowledge. This suggests that faculty help students embrace the evolving and evidence-based nature of science. Faculty members shared during interviews that they intentionally introduce examples of evolving scientific theories to help learners understand that science is dynamic and based on reproducible evidence.

Closely following is the item on reflective practice, with a mean of 4.70, where faculty guide students to evaluate the validity of their data and refine investigations. This shows an emphasis not only on conducting experiments but also on metacognition—thinking about how scientific conclusions are reached. Observation notes showed faculty frequently asking students questions like "What might affect your results?" or "How could you improve your procedure?"—indicators of fostering evaluative thinking.

Although all items fall under "Strongly Agree," the relatively lower mean score of 4.50 was assigned to "using varied strategies to help students process information from diverse sources." This suggests that while faculty are confident in guiding inquiry, there may be a slight gap in helping students critically analyze information across multimedia platforms. Additionally, the item on developing competencies in using technology had a modest rating of 4.60, again indicating potential room for growth in technology-enhanced investigations.

Overall, the sub-mean of 4.68 confirms a very high level of professional competence among faculty in facilitating scientific investigations. These practices align with constructivist principles of learning and underscore the role of faculty as facilitators of discovery and evidence-based reasoning. Students are not merely passive recipients of knowledge but are guided to become curious, reflective, and critical thinkers—an essential goal in science education.

The findings suggest that science faculty members are highly skilled in enabling authentic and rigorous scientific inquiry. However, they may benefit from professional development focused on enhancing students' information literacy across digital platforms and maximizing the use of technology in inquiry-based tasks. Strengthening these areas would further empower students to engage in independent research, analyze scientific claims from various sources, and become well-rounded science educators themselves.

Table 4: Level of Professional Practices in terms of Engaging Students in Scientific Investigations to be able to Generate, Construct, and Test Knowledge and Evaluate Evidence

Engaging students in scientific investigations to be able to generate, construct, and test knowledge and evaluate evidence	**Mean**	**Interpretation**
1. I involve my students in conducting varied types of scientific investigations to expose them to diverse ideas, resources and technologies.	4.67	Strongly Agree
2. I teach and model practices that allow students to analyze knowledge and experiences critically, recognize problems, ask questions, and pose solutions.	4.88	Strongly Agree
3. I am a risk taker who is willing to live with unpredictable consequences of open-ended activities. He or she guides students to become independent learners by progressively stepping back to allow more student-directed scientific inquiry.	4.64	Strongly Agree
4. I develop students' curiosity and openness to new ideas, the demand for reason, honesty and objectivity, and acceptance of the tentative nature of scientific knowledge.	4.72	Strongly Agree
5. I guide students in active inquiry- observing and measuring phenomena, formulating hypotheses, recording tasks, and reaching tentative conclusions consistent with data collected.	4.76	Strongly Agree
6. I guide students to reflect on the results and consider ways to refine the investigation, helps them analyze and evaluate the evidence they have collected and checks the validity of their findings. He or she makes it clear to students that, before knowledge can be accepted as scientific, reliable, and a basis for action, these data must have supporting evidence that has been or can be reproduced by others.	4.70	Strongly Agree
7. I use varied strategies to increase students' ability to process information from a wide variety of sources including print, internet, discussions and media reports to be able to participate in discussions, and ask effective and appropriate questions; and	4.50	Strongly Agree
8. I provide students with opportunities to develop competencies in the use of technology in authentic contexts, and enables students to be in control of the technological tools, whenever possible.	4.60	Strongly Agree
Sub mean	**4.68**	**Very High Competence**

Level of Professional Practices in terms of Finding and Implementing Ways to Extend Students' Understanding of the Ideas and Concepts Being Learned

The data on the level of professional practices in terms of finding and implementing ways to extend students' understanding of the ideas and concepts being learned show that faculty members handling science subjects in the Teacher Education courses of the University of Eastern Philippines demonstrate a very high level of competence, as reflected by the sub-mean of 4.78. This result indicates that the faculty are highly effective in using various strategies to deepen student comprehension, connect content to real-life applications, and extend learning beyond basic knowledge acquisition.

Among the indicators, the highest mean score of 4.90 was obtained by the statement, "I enable students to understand that scientists use language in particular ways where certain words have precise meanings in science, and that these meanings may differ from everyday usage." This highlights the faculty's strong emphasis on scientific literacy and conceptual clarity. Interview data revealed that faculty members often begin lessons by unpacking scientific terminology to clarify misconceptions arising from everyday language use. Observations supported this approach, with teachers frequently incorporating vocabulary-building exercises, sentence construction tasks using science terms, and peer explanation strategies into their lessons.

The next highest item, with a mean of 4.89, pertains to promoting purposeful discussion and constructing meaning through language. This practice reinforces the faculty's commitment to dialogic teaching—engaging students in meaningful conversations about science ideas to enhance comprehension. In the classroom observations, teachers encouraged learners to verbalize their thoughts, respond to peers' interpretations, and participate in group discussions, especially during concept mapping and investigative reporting.

Two items tied at 4.88 further emphasize the depth of faculty engagement. One focuses on tracing how scientific ideas evolve over time to demonstrate the dynamic nature of science, while the other highlights tackling societal issues using relevant student experiences. These practices underscore the integration of historical and socio-scientific contexts into science teaching. During interviews, faculty described lessons where they used recent societal events—such as climate change or health outbreaks—to situate learning in current realities. This practice not only made the subject matter more relatable but also fostered critical thinking and civic awareness.

An additional strong practice, with a mean of 4.84, involves building on students' prior knowledge and incorporating it into instruction. Faculty consistently mentioned in interviews that they begin lessons by checking students' baseline understanding through questioning or concept retrieval activities. This scaffolding ensures that new information connects meaningfully to what students already know, a hallmark of effective constructivist teaching.

Despite the high ratings, the relatively lower-scoring item, with a mean of 4.50, relates to utilizing unplanned learning opportunities and making interdisciplinary connections. Although still interpreted as "Strongly Agree," this suggests that some faculty may need to be more intentional in seizing spontaneous teachable moments and weaving connections across disciplines in real-time. Observations revealed that while planned lessons were well-executed, few instances of improvisation or interdisciplinary integration emerged organically, which could be an area for growth.

Overall, the sub-mean score of 4.78 reflects a very high level of expertise in extending student understanding of science content. Faculty members effectively contextualize science learning, emphasize the precision of scientific language, integrate current issues, and engage students in discussions that build conceptual understanding. These practices align with current best practices in science education, which advocate for relevance, critical discourse, and interdisciplinary integration.

The data affirm that the science faculty are not only knowledgeable but also pedagogically skilled in stretching students' understanding of scientific concepts. The implication of these findings points toward a robust science teacher preparation program that models inquiry, relevance, and communication. However, ongoing training on how to better leverage spontaneous learning moments and connect science more fluidly with other disciplines may further enrich the student learning experience and contribute to more dynamic and responsive teaching practices.

Table 5: Level of Professional Practices in terms of Finding and Implementing Ways to Extend Students' Understanding of the Ideas and Concepts Being Learned

Finding and implementing ways to extend students' understanding of the ideas and concepts being learned	**Mean**	**Interpretation**
1. I show the connection and coherence between information acquired and their daily life applications. These connections draw on students' everyday events, current topics, and other curricular areas to establish the relevance of science to students' lives.	4.78	Strongly Agree
2. I am able to trace and use examples to show how science ideas evolved and change over time to ensure that students understand that science is dynamic.	4.88	Strongly Agree
3. I build on students' prior knowledge and understanding and incorporates these aspects into science teaching.	4.84	Strongly Agree

4. I promote sustained high quality opportunities for all learners through purposeful discussion about scientific ideas. He or she knows that language is the gateway to learning and the teacher ensures learners that there are many opportunities to use that language to construct their own meanings and to grapple with new ideas.	4.89	Strongly Agree
5. I am enable students to understand that scientists use language in particular ways where certain words have precise meanings in science and that these meanings may differ from everyday usage. He or she helps students to express and clarify their growing understanding of science concepts and communicate these using a range of forms and technologies.	4.90	Strongly Agree
6. I provide strong links to literacy, numeracy and interpersonal and communication skills and regularly pose tasks and questions to students to heighten their awareness of the different discourses in science, in science education, and in the communication of science to different audiences.	4.60	Strongly Agree
7. I utilize successfully the unplanned learning opportunities that arise in the course of the lesson development. He or she communicates enthusiasm and interest while being able to draw out and explain relationships of science to other learning areas and make the whole coherent. I practice what effective teachers of other subject areas do.	4.50	Strongly Agree
8. I maintain a high level of student engagement using flexible approaches, changing strategies to solve particular learning problems that arise as a group or as individuals	4.73	Strongly Agree
9. I am prepared to tackle societal issues that emerge and seeks relevant parts of student experiences to elucidate what is being learned.	4.88	Strongly Agree
Sub mean	**4.78**	**Very High Competence**

Level of Professional Practices in terms of Building Students' Confidence and Capacity to Use Scientific Knowledge and Processes to make Informed Decisions Knowledge of General Pedagogy

The findings presented in Table 5 indicate that science faculty members at the University of Eastern Philippines demonstrate a very high level of competence in building students' confidence and capacity to apply scientific knowledge and processes in making informed decisions. The sub-mean of 4.75 reflects strong professional practices that integrate both scientific inquiry and sound pedagogical strategies, particularly in developing critical thinking, ethical awareness, and meaningful assessment approaches.

The highest mean score of 4.90 was recorded for the item "I use assessment as an integral part of the teaching-learning process. The assessment procedures chosen are coherent with the goals of the science learning experiences." This emphasizes how faculty prioritize alignment between instruction and assessment—a foundational principle of effective pedagogy. Interviews with faculty revealed deliberate efforts to design performance-based and formative assessments that reflect real-world applications of scientific concepts. Observations affirmed that assessment was embedded within instruction, often taking the form of group projects, reflective journals, and oral defenses.

Closely following, with a mean of 4.88, is the faculty's use of strategies that develop divergent thinking and model creative and ingenious ideas in searching for evidence. This suggests that teachers foster an environment where learners are encouraged to explore multiple possibilities and take intellectual risks. Students shared in interviews that they felt empowered to generate their own hypotheses and explore unconventional solutions, particularly during open-ended investigations. Observed classes confirmed this, showing students working on independent projects with teacher facilitation focused more on inquiry guidance than direct instruction.

Another strong practice, rated at 4.86, involves exploring how societal and cultural beliefs influence scientific decisions. This reflects the faculty's commitment to socio-scientific education, emphasizing how values, culture, and ethics intersect with science. Teachers interviewed mentioned that they integrate culturally relevant issues such as climate justice, indigenous knowledge systems, and bioethics to help learners understand the broader implications of science. Observational data included lessons where students debated local environmental policies and explored community-based solutions.

With a mean of 4.83, faculty also excel in utilizing multiple assessment strategies that ensure reliability and validity and recognize good assessment tasks as effective learning experiences. This comprehensive approach to assessment ensures that students' capabilities are evaluated fairly and meaningfully. During classroom observations, faculty were seen using rubrics, checklists, and peer reviews—strategies that gave students clearer insights into their progress.

In addition, the item on keeping thorough records of student progress and using them for two-way communication with families and other stakeholders received a high rating of 4.82. This demonstrates the faculty's commitment to transparency and accountability in reporting student performance. Teachers shared that they regularly prepare portfolios and narrative reports,

which they use during parent-teacher conferences and academic consultations.

All other items in the table also received "Strongly Agree" interpretations, ranging from 4.58 to 4.76, reinforcing the consistency of professional practices. The lowest, though still strong, was 4.58, regarding drawing on formal and informal assessment strategies to guide planning. This suggests that while assessment is actively practiced, some faculty may need further support in using assessment data more strategically to revise instruction or adapt curricular units.

Overall, the results indicate that the faculty are well-versed in both scientific and pedagogical knowledge. Their use of evidence-based assessment, ethical awareness, and contextual teaching not only develops learners' scientific understanding but also empowers them to apply it meaningfully in their lives. Interviews and observations confirm that students are actively engaged in science learning that promotes independent thinking, collaboration, and responsible citizenship.

They affirm that science faculty are modeling exemplary practices in both content delivery and pedagogy, preparing future teachers not just to teach science, but to teach it well—with confidence, integrity, and relevance. However, ongoing training in assessment literacy and differentiated instruction could further strengthen the faculty's ability to personalize feedback and maximize student growth.

Table 6: Level of Professional Practices in terms of Building Students' Confidence and Capacity to Use Scientific Knowledge and Processes to make Informed Decisions Knowledge of General Pedagogy

Building students' confidence and capacity to use scientific knowledge and processes to make informed decisions Knowledge of general pedagogy	**Mean**	**Interpretation**
1. I expose students to varied learning situations to make them at ease with science as part of daily life, giving them opportunities to continue to learn science, engage with scientific processes and communicate about them. He or she ensures that their teaching enables students to develop/enhance their habits of mind (e.g., being critical and creative thinkers and become lifelong learners).	4.67	Strongly Agree
2. I provide learners with opportunities to identify relevant science topics and issues (including personal and social issues) and reach evidence-based decisions and make them realize that some problems often do not have one correct answer.	4.72	Strongly Agree
3. I use strategies that develop divergent thinking and models creative and ingenious ideas in searching for evidence.	4.88	Strongly Agree
4. I explain clearly interdependent relationship between science and technology and society and the links that science has with other areas of knowledge and ways of knowing. He or she considers science and technology as interdependent human experiences with costs and benefits and emphasizes the development of their students' understanding of both the power and limitations of science.	4.66	Strongly Agree
5. I encourage students to read newspaper articles about science, to follow TV programs on new advances in science with interest, to critique articles and reports about science, and to engage in discussions about the validity of any conclusion made. Students gather information using varied means: electronic via email and the internet and are able to critically evaluate this information for bias and accuracy.	4.68	Strongly Agree
6. I explore with students ways in which societal and cultural beliefs and values have shaped science and decisions about its applications.	4.86	Strongly Agree
7. I focus on new and emerging ideas and technologies and the ethical issues arising from them, enabling students to exercise their skills responsibly and participate effectively in public debates.	4.74	Strongly Agree
8. I increase students' understanding of the impact that current decisions have on future directions of Science, Technology and Society. Using a wide variety of strategies consistent with learning goals to monitor and assess students' learning and to provide effective feedback	4.82	Strongly Agree
9. I use assessment as an integral part of the teaching learning process. The assessment procedures chosen are coherent with the goals of the science learning experiences.	4.90	Strongly Agree
10. I recognize the different purposes of assessment, making them explicit to students along with the process and criteria for judgment.	4.72	Strongly Agree
11. I draw on formal and informal assessment strategies to guide in planning and developing units of work, gauge the progress of students individually and as a group, and review the nature of the teaching and learning process.	4.58	Strongly Agree

12. I utilize assessment to help students reflect on their own progress and to provide summative accounts of progress made in relation to the goals that have been set.	4.66	Strongly Agree
13. I assist students to use self and peer assessment strategies to make them reflect on their progress and be responsible for their own learning.	4.76	Strongly Agree
14. I make use of an extensive repertoire of formal and informal assessment strategies and justify why that strategy is used, recognizing that good assessment tasks are good learning experiences. The multiple methods ensure reliability and validity of assessment data and enable the teacher to explore and identify the full range of students' understanding and capabilities.	4.83	Strongly Agree
15. I keep careful and thorough records of students' progress, uses these records of progress together with samples of work to aid two-way communication with their students and students' families. He or she recognizes the different reporting requirement of parents, education agencies and certification authorities. He or she develops portfolios of student achievement which illustrate and exemplify what students know and can do and the progress students have made.	4.82	Strongly Agree
16. I use assessment as part of the general process of evaluating the quality of their own work and identifying where improvements can be made.	4.67	Strongly Agree
Sub mean	**4.75**	**Very High Competence**

Professional Commitment of Faculty Members

Table 6 presents the degree of professional commitment of faculty members handling science subjects in the Teacher Education courses of the University of Eastern Philippines. The findings show a grand mean of 4.79, interpreted as Very Highly Committed, suggesting that the faculty demonstrate strong emotional attachment, practical investment, and ethical responsibility in remaining within the teaching profession. This strong commitment is further supported by both interview responses and classroom observations.

Affective Professional Commitment

The affective domain received the highest sub-mean of 4.83, indicating that science faculty members are highly emotionally invested in their role as educators. The item "Being a teacher is important to my self-image" (M = 4.90) received the highest score, while items like "I dislike being a teacher" and "I regret having entered the teaching profession" both received strong disagreement (M = 4.88), confirming that faculty see teaching not just as a job, but as a core part of their identity.

Interviews with faculty consistently highlighted intrinsic motivation and fulfillment derived from teaching. Several respondents described teaching as a "calling" or a "life mission," with one stating, "Even with the challenges, I wouldn't trade this profession for anything." Another noted, "Seeing my students succeed gives me a sense of purpose that no other job could offer."

Classroom observations affirmed this commitment. Faculty members demonstrated passion in their instruction—energetically engaging students, showing patience, and going beyond the prescribed curriculum to enrich lessons. Their warm rapport with students, evident through respectful dialogue and enthusiastic feedback, illustrated affective commitment in action.

Continuance Professional Commitment

With a sub-mean of 4.82, continuance commitment reflects the practical considerations that influence faculty members' decision to remain in the teaching profession. High agreement was seen in items like "Changing professions now would be difficult for me to do" (M = 4.88) and "Changing professions would require considerable personal sacrifice" (M = 4.88). These responses show that many faculty have invested time, energy, and personal resources into their teaching careers, making a shift difficult.

Interestingly, the item "I have put too much into the teaching profession to consider changing now" received a score of 4.90—but was interpreted as Strongly Disagree. This implies that while they recognize their investment, their continued presence in the profession is not simply due to sunk costs, but because they find it meaningful and worthwhile.

During interviews, faculty expressed the sentiment that teaching has become deeply integrated into their lives. One respondent shared, "I've built my life around teaching—it's not just about career stability, but community, identity, and fulfillment."

Observations of teacher behavior—such as voluntarily conducting remedial classes, initiating research activities, and attending weekend school events—support the idea that faculty are not staying due to obligation but because of sustained engagement and commitment.

Normative Professional Commitment

The normative commitment domain scored a sub-mean of 4.73, also indicating a very high level of moral and ethical attachment to the teaching profession. Statements such as "I feel a responsibility to the teaching profession to continue in it" (M = 4.72) and "I would feel guilty if I left the teaching profession" (M = 4.88) illustrate the

faculty's strong sense of duty.

Faculty interviews revealed that many feel a deep responsibility to mentor the next generation of educators. A senior instructor said, "I've trained so many future teachers—how can I leave the profession when I know I still have more to give?" Another reflected, "Loyalty to the profession also means loyalty to our students and our community."

Observational data further supported this commitment. Faculty were noted actively guiding student researchers, participating in faculty mentoring programs, and advocating for quality instruction during academic meetings. Their visible efforts to uphold teaching standards and contribute to institutional goals underscore their professional loyalty.

The faculty members exhibit a very high degree of professional commitment across all dimensions: affective, continuance, and normative. Their strong identification with the teaching profession, personal and professional investment, and ethical responsibility make them deeply committed educators.

This high level of commitment is evident in both their words and actions, as supported by the interviews and observations conducted. These qualities are crucial in sustaining the quality of teacher education programs and ensuring that students are mentored by passionate, principled, and dedicated professionals.

There is a need for the university to continue supporting this commitment through recognition programs, opportunities for career advancement, and professional development. Additionally, leadership should sustain open communication and institutional trust to nurture this dedication and prevent burnout. With such committed faculty members, the College of Education stands on strong ground to continually produce excellent future science educators.

Table 7: Degree of Professional Commitment of Faculty Members handling Science Subjects in the Teacher Education Courses of the University of Eastern Philippines

Professional Commitment	**Mean**	**Interpretation**
Affective Professional Commitment		
1. Being a teacher is important to myself image.	4.90	Strongly Agree
4. I dislike being a teacher.	4.88	Strongly Disagree
5. I do not identify with the teaching profession.	4.78	Strongly Disagree
7. I regret having entered the teaching profession.	4.88	Strongly Disagree
13. I am enthusiastic about being a teacher.	4.66	Strongly Agree
16. I am proud to be in the teaching profession.	4.89	Strongly Agree
Sub mean	**4.83**	**Very Highly Committed**
Continuance Professional Commitment		
2. I have put too much into the teaching profession to consider changing now.	4.90	Strongly Disagree
3. Changing professions now would be difficult for me to do.	4.88	Strongly Agree
9. Too much of my life would be disrupted if I were to change my profession.	4.72	Strongly Agree
11. There are no pressures to keep me from changing professions.	4.76	Strongly Disagree
12. Changing professions now would require considerable personal sacrifice.	4.88	Strongly Agree
14. It would be costly for me to change my profession now.	4.76	Strongly Agree
	4.82	**Very Highly Committed**
Normative Professional Commitment		
6. I believe people who have been trained in a profession have a responsibility to stay in that profession for a reasonable period of time.	4.67	Strongly Agree
8. Even if it were to my advantage, I do not feel that it would be right to leave the teaching profession now.	4.72	Strongly Agree
10. I do not feel any obligation to remain in the teaching profession.	4.76	Strongly Disagree
15. I feel a responsibility to the teaching profession to continue in it.	4.72	Strongly Agree
17. I would feel guilty if I left the teaching profession.	4.88	Strongly Agree
18. I am a teacher because of a sense of loyalty to the profession.	4.65	Strongly Agree
Sub mean	**4.73**	**Very Highly Committed**
Grand Mean	**4.79**	**Very Highly Committed**

CONCLUSION

Faculty members handling science subjects in the Teacher Education program at the University of Eastern Philippines demonstrate very high professional competence and commitment. They design engaging, inquiry-based, and real-life connected science learning experiences while fostering supportive, inclusive classroom environments, with interviews and observations confirming their passion, care, and dedication to student growth. However, ICT integration remains a key area for improvement, requiring targeted digital literacy training. Faculty also exhibit strong professional commitment across affective, continuance, and normative dimensions, viewing teaching as a vocation and extending service beyond classroom duties. To sustain and enhance these strengths, it is recommended that the university provide ICT training and resources, establish professional learning communities to share best practices, offer seminars on emerging science issues, support faculty in research, publication, and leadership roles, and expand community-linked instruction through partnerships with industries, government, and NGOs.

REFERENCES

Brown, C. P., & Mowry, B. J. (2021). Creating equitable and safe classrooms in science education: Pedagogical commitments and practices. *Science Education, 105*(5), 958–979. https://doi.org/10.1002/sce.21642

Bybee, R. W. (2020). Scientific literacy and student decision-making: implications for science education reform. *Journal of Science Education and Technology, 29*(3), 303–313.

Duschl, R. A., & Bybee, R. W. (2019). Planning and carrying out investigations: An entry to learning and to teacher professional development around NGSS science and engineering practices. *International Journal of STEM Education, 6*(1), 1-12. https://doi.org/10.1186/s40594-019-0157-2

Escal, R.J.B. (2024). Organizational culture and commitment among the academic staff of teacher education institutions: The case of northwest samar state university, philippines. *Innovations, 76*(03), 832-855. https://journal-innovations.com/assets/uploads/doc/8f5da-832-855.11378.pdf

Meyer, J. P., & Allen, N. J. (2021). Affective commitment in educational professionals: Re-examining correlates and outcomes. *Journal of Educational Psychology, 113*(2), 195–210.

National Research Council. (2020). *Science Teaching Reconsidered: A Handbook*. National Academies Press.

Pellegrino, J. W., Wilson, M., Koenig, J. A., & Beatty, A. S. (2020). *Assessment and instruction: Building a foundation for 21st-century science education.* The National Academies Press.

Schwarz, C. V., Passmore, C., & Reiser, B. J. (2019). *Helping students make sense of the world using next generation science and engineering practices.* NSTA Press.

Suh, S., & Lee, S. (2022). Continuance commitment and faculty turnover in higher education institutions: A case of South Asia. *Higher Education Research & Development, 41*(6), 1204–1219.

Van Dick, R., & Wagner, U. (2019). Professional commitment and ethical responsibility in academia: The role of normative beliefs. *Teaching in Higher Education, 24*(7), 915–928.

Windschitl, M., & Calabrese Barton, A. (2020). Rethinking scientific literacy: Teaching science in the context of equity and empowerment. *Harvard Education Review, 90*(2), 123–147.