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# **Professional Knowledge and Organizational Commitment of Faculty Members Handling Science Subjects in the University of Eastern Philippines**

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## **Author's contribution**

*The sole author designed, analyzed, interpreted and prepared the manuscript.*

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## **ABSTRACT**

This study aimed to determine the professional knowledge of faculty members in terms of knowledge of science content, knowledge of general pedagogy, pedagogical content knowledge, and knowledge of the curriculum structure and materials and find out the degree of organizational commitment along with affective, continuance, and normative organizational commitment. A complete enumeration of faculty members handling science teacher education courses in the College of Education and College of Science. Descriptive-observational and survey were employed. The questionnaires were adapted from the framework for Philippine Science Teacher Education published by the Department of Science and Technology (DOST) and University of the Philippines-National Institute for Science and Mathematics Education Development (UP-NISMED) and the organizational commitment along with affective, continuance, and normative commitment constructed and tested. It was found out that faculty members have very high professional; specifically, very high knowledge content, very high knowledge of general pedagogy, and very high knowledge of the curriculum structure and materials. It was also found out that faculty members are very highly committed to the University. Specifically, faculty members are very highly committed to affective, continuance, and normative organizational commitment.

*Keywords: Professional knowledge; teachers' commitment; science education.*

## 1. INTRODUCTION

Andarino [1] in her study of biology in high school revealed that biology teachers are highly-skilled professionals, therefore, they are experts in their field of specialization. This is because of the strict selection/admission policy on hiring teachers such that teachers. It also revealed that there is a significant relationship between the teacher's educational attainment and the student's performance in biology.

Teachers have high competency in social regard for learning, diversity of learners, curriculum, planning, assessing, and reporting, community linkages, and personal growth, and professional development. Teachers consider themselves to possess the strength to be successful educators. Most of them have completed already the training and development needs. It can be concluded that most teachers plan and carry out competency-based education in mind and practice. They approach instruction and assessment from the perspective that places primary emphasis on identifying and measuring specific learning outcomes or competencies [2].

Linda Darling-Hammond [3] stipulated that teachers who will successfully carry out this mission need to be well-prepared and well-equipped. It is inherent to any educational institution to center its mission in educating children to higher standards of performance by providing them with the experiences necessary to learn, define, analyze, adapt, and invent. If we want learners to be functional in a highly globalized world of work, we need to uplift standards. Raising the learning standards can be achieved through a responsive teacher preparation program and continuing professional development program for all practicing teachers. In the Philippines, recent efforts have been directed to improving science education, both at the basic and teacher education levels.

Bagraim (2003) discoursed and quoted that "commitment is a psychological state that (a) characterizes the teacher's relationship with their profession and (b) has implications for the teacher's decision to continue or discontinue membership of their profession and the organization. Thus, ensuring the commitment of teachers by giving them valuable reasons to stay and feel obliged to stay. It is assumed that professional knowledge can be ultimately

achieved when given the reasons by the organization to stay and feel the sense of obligation.

This study aimed to determine the professional knowledge and organizational commitment of faculty members handling science subjects in the College of Education, University of Eastern Philippines. This also sought to reveal the professional knowledge and organizational commitment of faculty members. This research will help the university administration improve their development programs to their faculty-members for holistic improvement.

## 2. METHODOLOGY

This study employed descriptive-observational and survey with the use of survey questionnaires and unstructured interviews 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 the Department of Science and Technology (DOST) and University of the Philippines-National Institute for Science and Mathematics Education Development (UP-NISMED) and the organizational commitment along with affective, continuance, and normative commitment constructed and tested by Meyer (1991) with Cronbach's alpha of 0.91.

Questionnaires were personally distributed and retrieved by the researcher. An unstructured interview was also done to complement the quantitative aspect.

## 3. RESULTS AND DISCUSSIONS

### 3.1 Professional Knowledge of Faculty Members

Table 2 shows the level of professional knowledge of faculty members handling science subjects in the teacher education courses of the University of Eastern Philippines. It shows that faculty members had very high professional knowledge (4.70). This means that faculty

members had in-depth knowledge of science content, knowledge of pedagogical content, knowledge of general pedagogy, and knowledge of the science curriculum.

In terms of knowledge content, faculty members were very highly competent (4.66). It shows that faculty members believed were very highly competent as they have an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines (4.55), have a mastery of concepts considered important for all students and those that serve as enrichment topics for particular grade or year levels and can identify and address science misconceptions of students and in textbooks (4.60), have a good grasp of the complex relationship between science and technology, that technology is not just applied science but that it is a cultural response of people to problems and opportunities that then shapes the way they live, think, and work (4.72), have an updates on recent developments in scientific research and uses these knowledge to motivate learners and make science teaching interesting (4.70), know how to connect learning to what should be taught and how to incorporate new science knowledge into practice (4.65) and help learners cope with the demands of a rapidly changing society strongly influenced by S & T but realize that science cannot answer all questions the learners might ask (4.74).

This is confirmed by the responses in the interview that faculty members possessed disciplinary conceptual knowledge with a deep and strong understanding of the substance, content, structure, and organization of the science subject itself. As observed in science classes that faculty members showed competence in extensively showing knowledge of science concepts and how they are contextualized for real-life situations. When teachers were asked about how they presented concepts, common responses pointed to hands-on activities using localized materials.

In terms of knowledge of general pedagogy, faculty members were very highly competent (4.72). It shows that faculty members believed were very highly competent as they understand the unique characteristics of learners, their strengths and potential, talents, abilities, and perspectives based on the developmental characteristics of the age groups with which he or she is working(4.80), know how to plan and design strategies to support the intellectual,

social, and personal development of each learner (4.62), understand the variety of information and communications technology (ICT) and other resources and how to incorporate them into new learning experiences (4.78), understand the nature of varied forms of assessment for both formative and summative purposes, the role of feedback to both learners and parents, and when and how to use them most effectively (4.74), and know-how to deal fairly with issues that arise in classroom management and communication techniques that generate educationally effective and safe environments (4.66).

In the interviews, common responses centered on the idea that knowing the characteristics and cognitive levels of varied learners, variety of learner-centered teaching and learning approaches including assessment and classroom management as well as the knowledge about how learners learn, alternative conceptions that many learners hold, issues of safety, availability of appropriate resources, and the values held by various stakeholders in the education process would help to contextualize and simplifying science concepts.

In terms of pedagogical content knowledge, faculty members were very highly competent (4.79). It means that faculty members had deep knowledge about how to teach the subject matter. It shows that faculty members were very highly competent in developing learners' deeper understanding of subject matter even s/he has limited background about the learner (4.84), aware of suitable science goals and learning programs for or her students, knowing that these will necessitate change over time depending on the circumstances of learners and other relevant factors (4.78), Hallinger P (2003) know a wide range of ways in which learners are likely to learn science best, building on prior knowledge and experiences and mental constructs to introduce new experiences and ideas (4.86), and know-how to engage learners in discussions so that he or she clarifies and develops their understanding of scientific concepts under investigation (4.66).

In terms of knowledge of the curriculum structure and materials, faculty members were very highly competent (4.63). It shows that faculty members strongly understand the philosophy and the place of science in the structure of the overall curriculum at the basic education level (4.42), know the content and connections of science across the different science disciplines at the basic education level and with other curricular

areas (4.52), understand that the science education needs of all students (the future citizens) are different from the science education needs of students who have an interest in scientific careers (4.66), know laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs (4.76), and know the characteristics of good science textbooks and other instructional materials that would bring about meaningful learning of students (4.78).

In the interview, the common concepts of the competence of faculty members center on their deep knowledge of the place of science in the basic education level, the interrelatedness of the content of science across the scientific discipline and with other curricular areas, and the quality materials needed to support the curriculum.

### 3.2 Organizational Commitment of Faculty Members

Table 3 presents the responses of faculty members on their degree of organizational commitment along with affective, continuance, and normative. The table below shows that faculty members were very highly committed (3.63). It means that faculty members were psychologically attached to the organization.

The effective organizational commitment shows that faculty members were very highly committed (4.57). As complemented in the responses during the interview that faculty members highly identified with, involved in, and emotionally attached to the organization. It also shows that faculty members highly believed in feeling like "part of the family" at the school (4.42), "emotionally attached" to this school (4.46), discussing my school with people outside (4.72), being attached to this school other than any schools (4.66), this school has a great deal of personal meaning (4.42), feeling a strong sense of belonging to my school (4.68), and happy to spend the rest of career with this school (4.72).

In the continuance organizational commitment, faculty members were very highly committed (4.67). As viewed in the common responses in the interview that faculty members strongly believed that leaving the University means high costs and an ultimate financial issue that needs deep realization during the decision-making process. It shows that faculty members were afraid of what might happen if s/he quits teaching position without having another one lined up

(4.42), very hard to leave school right now, even if s/he wanted to (4.66), too many disruptions s/he wanted to leave school now (4.72), staying with the school is a matter of necessity as much as desire (4.88), too few options to consider leaving this school (4.82), and loyalty is important and to feel a sense of moral obligation to remain (4.62). It means that faculty members recognized well the costs associated with leaving the University.

In the normative organizational commitment, faculty members were very highly committed (4.65). During the interviews, the responses center on a sense of obligation. It shows that faculty members were very highly committed because they strongly agreed that to be a "schoolman" or "school woman" is sensible (4.42), believed in the value of remaining loyal to one school (4.55), loyalty to school (4.66), people these days do not move from company to company too often (4.68), jumping from school to another is unethical (4.72), not right to leave the school (4.80) staying in one school is better (4.72).

It has been identified in the interview that faculty members were very much concerned with the financial and emotional sacrifices they have invested in the teaching profession that it would be difficult to shift to other professions. Some noteworthy responses from the interviews said that *"the University provided me very attractive scholarship scheme and serving the University would be my utmost consideration" and "the University needs my expertise that's why I am staying."*

This negates the findings of Joffres and Haughey [4] through their qualitative research that teachers' commitment was declining, Bogler and Somech (2004) because it was found out that teachers' participation in technical decisions did not predict the organizational commitment.

This confirms the findings of Jermier and Berkes (2009) that the employees who were allowed to participate in decision-making had higher levels of commitment to the organization, Bycio, Hackett, and Allen (2005) that intellectual stimulation and individualized consideration significantly affect the dimensions of commitment towards the organization, Jaros [5] that empowerment was a strong factor in determining the degree of loyalty and enthusiasm to continue membership in the organization, Cohen and [6-8] that effective and continuance

**Table 1. The following scoring and interpretation were used**

Mean	Interpretation	Positive Statement	Score	Negative Statement	Score
1.0-1.79	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

**Table 2. Level of Professional Knowledge of Faculty Members handling Science Subjects in the Teacher Education Courses of the University of Eastern Philippines**

Professional Knowledge	Mean	Interpretation
<b>Knowledge of science content</b>		
1. I have an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.	4.55	Very Highly Competent
2. I have a mastery of concepts considered important for all students and those that serve as enrichment topics for particular grade or year levels. I can identify and address science misconceptions of students and in textbooks.	4.60	Very Highly Competent
3. I have a good grasp of the complex relationship between science and technology, that technology is not just applied science but that it is a cultural response of people to problems and opportunities that then shapes the way they live, think, and work.	4.72	Very Highly Competent
4. I have an updates on recent developments in scientific research and uses these knowledge to motivate learners and make science teaching interesting.	4.70	Very Highly Competent
5. I know how to connect my learning to what should be taught and how to incorporate new science knowledge into practice.	4.65	Very Highly Competent
6. I help learners cope with the demands of a rapidly changing society strongly influenced by S & T but realize that science cannot answer all questions the learners might ask.	4.74	Very Highly Competent
<b>Sub mean</b>	<b>4.66</b>	<b>Very Highly Competent</b>
<b>Knowledge of general pedagogy</b>		
1. I understand the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives based on the developmental characteristics of the age groups with which he or she is working.	4.80	Very Highly Competent
2. I know how to plan and design strategies to support the intellectual, social, and personal development of each learner.	4.62	Very Highly Competent
3. I understand the variety of information and communications technology (ICT) and other resources and how to incorporate them into new learning experiences.	4.78	Very Highly Competent
4. I understand the nature of varied forms of assessment for both formative and summative purposes, the role of feedback to both learners and parents, and when and how to use them most effectively.	4.74	Very Highly Competent

5. I know how to deal fairly with issues that arise in classroom management and communicate techniques that generate educationally effective and safe environments.	4.66	Very Highly Competent
<b>Sub mean</b>	<b>4.72</b>	<b>Very Highly Competent</b>
<b>Pedagogical content knowledge</b>		
1. I do not only have a strong background of his or her subject matter but also knows how to develop learners' deeper understanding of subject matter.	4.84	Very Highly Competent
2. I am aware of suitable science goals and learning programs for his or her students, knowing that these will necessitate change over time depending on the circumstances of learners and other relevant factors.	4.78	Very Highly Competent
3. I know a wide range of ways in which learners are likely to learn science best, building on prior knowledge and experiences and mental constructs to introduce new experiences and ideas.	4.86	Very Highly Competent
4. I know how to engage learners in discussions so that he or she clarifies and develops their understanding of scientific concepts under investigation.	4.66	Very Highly Competent
<b>Sub mean</b>	<b>4.79</b>	<b>Very Highly Competent</b>
<b>Knowledge of the curriculum structure and materials</b>		
1. I understand the philosophy and the place of science in the structure of the overall curriculum at the basic education level.	4.42	Very Highly Competent
2. I know the content and connections of science across the different science disciplines at the basic education level and with other curricular areas.	4.52	Very Highly Competent
3. I understand that the science education needs of all students (the future citizens) are different from the science education needs of students who have an interest in scientific careers.	4.66	Very Highly Competent
4. I know laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.	4.76	Very Highly Competent
5. I know the characteristics of good science textbooks and other instructional materials that would bring about meaningful learning of students.	4.78	Very Highly Competent
<b>Sub mean</b>	<b>4.63</b>	<b>Very Highly Competent</b>
<b>Grand Mean</b>	<b>4.70</b>	<b>Very Highly Competent</b>

**Table 3. Organizational commitment of faculty members handling science subjects in the teacher education courses of the University of Eastern Philippines**

<b>Organizational Commitment</b>		<b>Mean</b>	<b>Interpretation</b>
<b>Affective Organizational Commitment</b>			
1.	I do not feel like “part of the family” at my school.	4.42	Strongly Disagree
2.	I do not feel “emotionally attached” to this school.	4.46	Strongly Disagree
3.	I enjoy discussing about my school with people outside.	4.72	Strongly Agree
4.	I do not think I could become attached to another school as I am to this one.	4.66	Strongly Disagree
5.	This school has a great deal of personal meaning for me.	4.42	Strongly Agree
6.	I do not feel a strong sense of belonging to my school.	4.46	Strongly Disagree
7.	I feel as if this school’s problems are my own.	4.68	Strongly Agree
8.	I would be happy to spend the rest of my career with this school.	4.72	Strongly Agree
<b>Sub mean</b>		<b>4.57</b>	<b>Very High Commitment</b>
<b>Continuance Organizational Commitment</b>			
1.	I am not afraid of what might happen if I quit my teaching position without having another one lined up.	4.42	Strongly Agree
2.	It would be very hard for me to leave my school right now, even if I wanted to.	4.66	Strongly Agree
3.	Too much in my life would be disrupted if I decided I wanted to leave my school now.	4.72	Strongly Agree
4.	Right now, staying with my school is a matter of necessity as much as desire.	4.88	Strongly Agree
5.	One of the few serious consequences of leaving this school would be the scarcity of available alternatives.	4.42	Strongly Agree
6.	It wouldn't be too costly for me to leave my organization now.	4.62	Strongly Agree
7.	One of the major reasons I continue to work for this school is that leaving would require considerable personal sacrifice — another school may not match the overall benefits I have here.	4.88	Strongly Agree
8.	I feel that I have too few options to consider leaving this school.	4.82	Strongly Agree
9.	One of the major reasons I continue to work for this school is that I believe that loyalty is important and therefore feel a sense of moral obligation to remain.	4.62	Strongly Agree
<b>Sub mean</b>		<b>4.67</b>	<b>Very High Commitment</b>
<b>Normative Organizational Commitment</b>			
1.	I do not think that wanting to be a “schoolman” or “school woman” is sensible anymore.	4.42	Strongly Disagree
2.	I was taught to believe in the value of remaining loyal to one school.	4.55	Strongly Agree
3.	I do not believe that a person must always be loyal to his or her school.	4.66	Strongly Disagree
4.	I think that people these days move from company to company too often.	4.68	Strongly Disagree
5.	Jumping from school to school does not seem at all unethical to me.	4.72	Strongly Agree
6.	If I got another offer for a better job elsewhere, I would not feel it was right to leave my school.	4.80	Strongly Agree
7.	Things were better in the days when people stayed with one school for most of their careers.	4.72	Strongly Agree
<b>Sub mean</b>		<b>4.65</b>	<b>Very High Commitment</b>
<b>Grand mean</b>		<b>4.63</b>	<b>Very High Commitment</b>

commitment are dimensions of organizational commitment significantly related to resource and career enrichment, Evers (2000) that teachers are committed when they have the feeling of ownership that comes from initiating ideas rather than responding to others. Also with the concept of Gaziel and Weiss (2000) that teachers' participation through strong voice in decisions and policies are determinants of their commitment towards the profession; and finally, the findings of Wu and Short [9] that professional growth and self-efficacy are significant predictors of organizational commitment.

#### **4. CONCLUSIONS**

Based on the data gathered, it was found out that faculty members have very high professional knowledge which implies that faculty members have in-depth knowledge of science content, knowledge of pedagogical content, knowledge of general pedagogy, and knowledge of the science curriculum.

Specifically, faculty members have very high knowledge content which implies that faculty members highly possessed disciplinary conceptual knowledge with deep and strong understanding of the substance, content, structure and organization of the science subject itself; very highly knowledge of general pedagogy which implies that faculty members have deep knowledge about characteristics and cognitive levels of varied learners, variety of learner-centered teaching and learning approaches including assessment and classroom management as well as the knowledge about how learners learn, alternative conceptions that many learners hold, issues of safety, availability of appropriate resources, and the values held by various stakeholders in the education process; very high pedagogical content knowledge which implies that faculty members had deep knowledge about how to teach the subject matter; and very high knowledge of the curriculum structure and materials which implies that faculty members had deep knowledge of the place of science in the basic education level, the interrelatedness of the content of science across the science discipline and with other curricular areas, and the quality materials needed to support the curriculum

A very highly committed results revealed that the organizational commitment of faculty members of UEP was seen. It was also found out that faculty members are very highly committed to the

University which implies that faculty members have a high sense of obligation to stay in the University and are emotionally attached. Specifically, faculty members are very highly committed along with affective which implies that faculty members have highly identified with, involved in, and emotionally attached to the University; very highly committed along with continuance organizational commitment which implies that faculty members considered the costs associated with leaving the University; and very highly committed along with normative organizational commitment which implies that faculty members are strongly committed to the University because of sense of obligation.

#### **5. RECOMMENDATIONS**

The University should offer more attractive scholarship grants to faculty members to strengthen the sense of obligation in staying in the University. Faculty enhancements and other college-based and university-based activities that would strengthen the family-like environment and socialization of faculty members should be strengthened to deepen school identity and sense of belongingness. Faculty members should be provided with other benefits such as ensuring the qualification to performance-based bonuses to increase cost-related realizations in leaving the University and not to be attracted to other institutions.

#### **CONSENT**

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

#### **COMPETING INTERESTS**

Author has declared that no competing interests exist.

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