

Student Teachers' Content And Pedagogical Knowledge: Basis For Designing An Intervention Material For Beginning Teachers

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Abstract

The study aimed to identify the level of student teachers' content knowledge and pedagogical knowledge at Caraga State University. In line with this, the study pursued to determine the significant correlation between the level of student teachers' content knowledge and pedagogical knowledge. The findings of this research served as the foundation for developing intervention material for beginning teachers. This research employed a quantitative research framework, gathering data through online survey questionnaires for subsequent analysis. The results were yielded after keen examination, and it was discovered that the participants' level of content knowledge and pedagogical knowledge are both moderately extensive. Furthermore, the depth of pedagogical knowledge concerning approaches to enhance literacy and numeracy, strategies for fostering critical and creative thinking, and proficiency in teaching and learning Mother Tongue, Filipino, and English, along with classroom communication strategies, is extensive. The study showed that the student teachers' content knowledge significantly correlates with the pedagogical knowledge. It was concluded that student teachers have to be taught well about the content, and they have to be familiar with the varied teaching strategies before their deployment since both factors are proven to be associated with each other.

Index Terms

content knowledge, pedagogical knowledge, student teachers, teaching strategies

• Introduction

In the fourth industrial revolution, education sectors should be on the leading edge in helping people acquire the knowledge and skills they need to succeed. This includes acquiring relevant knowledge on digitization, transferable skills development which includes critical thinking, creativity or even self-management. Moreover, a learning to learn mindset continuously requires training, ideally from a young age, perhaps even starting in elementary education (Myklebust & Smidt, 2021).

The Philippine Constitution (Article IV, Section 23, Part 2) states that the objectives of tertiary education are: to train human power in the skills required for national development; to instill and foster appropriate and relevant attitudes, skills, and knowledge; and to enable each individual to become a valuable, productive and knowledge base member of society. If the Higher Educational Institution (HEI) graduates have the skills required to complete a teaching job, this provision may be implemented. It calls for a pre-service teacher to assess and evaluate his/her pedagogical knowledge required for the teaching climate of the 21st century. In addition, Commission on Higher Education (2022), allows pre-service teachers to participate and assist in limited actual teaching-learning activities that relate to assessment of learning, preparation of instructional materials, preparation of bulletin boards, and other routines in the classroom.

Hence, a good induction program addresses the important issues of transition from being a pre-service teacher to being a teacher and sets the tone for a teacher's personal and professional identity (Ryan, 2018).

Nonetheless, Caraga State University, College of Education send-off 88 student teachers to practice teaching in various elementary schools in Butuan City. In the 4TH IWAG Ceremony and Pre-Service Teachers' Pinning and Take-Off held at the Robinsons Mall Butuan North Atrium on February 10, 2023, College of Education (CEd) Dean Dr. Leo L. Codilla, Jr., highlighted the importance of the ceremony to future educators. "As you receive your pins today, you acknowledge and accept the responsibilities of developing and molding the minds of our youth, you will pledge a commitment to become education advocates and to uphold and perform the duties and responsibilities of a teacher to the best of your abilities."

Despite the continuous progress in updating teacher training and in-service training, teachers remain inadequate and thus continue to become less-demanded professionals. Many graduates fail to land teaching jobs, aggravating unemployment and underemployment in the country. One of the issues mentioned in the study of Flores (2017) regarding the College of Development Education's employability in Region V is the poor foundation given to graduates as far as pedagogical competence is concerned.

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The above-stated issues and concerns regarding teacher training prompted the researchers to examine the content knowledge and pedagogy knowledge of the student teachers. The results of this investigation were used as a basis for designing an intervention material for beginning teachers and it hoped to help improve the content and pedagogical knowledge of student teachers.

Research Framework

Objectives of the Study

This study assessed the student teachers' content knowledge and pedagogical knowledge as basis on designing an intervention material for beginning teachers. Specifically, it sought to answer the following queries:

1. What is the demographic profile of the student teachers in terms of:
 - 1.1 year;
 - 1.2 sex; and
 - 1.3 GPA?
2. What is the student teachers' level of content knowledge in terms of:
 - 2.1 content knowledge and its application within and across curriculum areas;
 - 2.2 research-based knowledge and principles of teaching and learning; and
 - 2.3 positive use of ICT?
3. What is the extent of student teachers' pedagogical knowledge in terms of:
 - 3.1 strategies for promoting literacy and numeracy;
 - 3.2 strategies for developing critical and creative thinking, as well as other higher-order thinking skills;
 - 3.3 Mother Tongue, Filipino and English in teaching and learning; and
 - 3.4 classroom communication strategies?
4. Is there a significant relationship between the student teachers' level of content knowledge and their extent of pedagogical knowledge?
5. Based on the findings, what intervention material may be developed?

Hypothesis

This study was guided by the null hypothesis tested at a 0.05 level of significance:

H₀: There is a significant relationship between the student teachers' level of content knowledge and their extent of pedagogical knowledge.

II. METHODOLOGY

Research Design

This study utilized a quantitative research design. It focused on gathering numerical data about the student teachers' content and pedagogical knowledge. This method emphasizes objective measurements and the statistical, mathematical, or numerical data collected through polls, questionnaires, and surveys (Babbie, 2010). Descriptive-correlational research design was used because it assessed the content and pedagogical knowledge of student teachers. It is also correlational since it tried to establish whether or not there is a significant relationship between content knowledge and the extent of pedagogical knowledge of the participants. The data gathered served as the bases for designing an intervention material for beginning teachers.

Sampling Design

The study also used probability sampling specifically simple random sampling where the researchers selected a smaller group from a larger group of the total number of the population. Fifty percent (50%) of the number of participants were considered in the study. Only the student teachers from each program including Bachelor of Elementary Education, Bachelor of Secondary Education Major in Science and Bachelor of Secondary Education Major in Mathematics students in Caraga State University were involved in the study.

Data Gathering Procedure

The researchers sent two (2) separate letters addressed to the Dean of College of Education through the BEEEd and BSEd Chairpersons to ask permission to allow the researchers to conduct a try-out test and survey. The researchers gathered data through an online generated survey via Google Forms with an attached consent. The link to the form was shared through Facebook Messenger to rely on the participant's convenience. Subsequently, the data were analyzed in percentage that was automatically generated by Google. Participants were assured that the researchers of the study maintained the confidentiality of the data shared.

III. RESULTS

Problem 1. Participants' Profile in terms of Program, Sex, and GPA

Table 1 displays the profile of the participants in terms of program, sex, and GPA. It can be gleaned from the table that 69.93% or 107 are female participants while 30.07% or 46 are male participants. This revealed that the majority of the participants are female suggesting that student teaching in the College of Education is dominated by the female sex.

Table 2

Profile of the participants in terms of program, sex and GPA

Variables		Frequency	Percentage
Program	BSED-MATH	52	33.99
	BSED-SCIENCE	55	35.95
	BEED	46	30.07
Sex	Female	107	69.93
	Male	46	30.07
GPA	1.00-1.25	28	18.30
	1.26-1.50	76	49.67
	1.51-1.75	31	20.26
	1.76-2.00	14	9.15
	2.01-3.00	4	2.61

On the other hand, the table also reveals that 35.95% or 55 are from the Bachelor of Secondary Education major in Science; 33.99% or 52 of the participants are from the Bachelor of Secondary Education major in Mathematics; and 30.07% or 46 are from the Bachelor of Elementary Education. This revealed that in general, a Bachelor of Secondary Education major in Science has the highest frequency suggesting that BSEd Science students dominate student teaching in the College of Education.

In addition, the table also shows that 49.67 got a GPA ranging from 1.26-1.50 while 2.61% or 4 got a GPA of 2.01-3.00. This revealed that the majority of the participants have a very good academic performance based on their GPA.

Problem 2. Student Teachers’ Level of Content Knowledge in terms of Applied Content Knowledge, Research-Based Knowledge; and ICT Knowledge

2.1 Applied Content Knowledge

Table 3 presents the student teachers’ content knowledge in terms of applied content knowledge. As presented in the table, indicator number two (2) states that understanding of the pre-requisite relationship among topics and concepts and the link to necessary cognitive structures that ensure student understanding of the subject garnered 4.16. This implies that the level of student teachers’ content knowledge is moderately extensive. On the other hand, indicator number one (1) which indicates “display extensive knowledge of the important concepts in the subject taught and its relation to other disciplines” accumulated the lowest mean that is 4.33, when compared to the other indicators suggesting that the level of content knowledge is moderately extensive. The overall weighted mean is 4.38 or agree indicating that the level of content knowledge moderately extensive. This further suggests that the student teachers have a moderately extensive applied content knowledge.

Table 3

Mean distribution of the student teachers’ level of content knowledge in terms applied content knowledge

Indicators	Mean	Description	Interpretation
1. Display extensive knowledge of the important concepts in the subject taught and it's relation to other disciplines.	4.33	Agree	The level of content knowledge is moderately extensive
2. Understanding of pre-requisite relationship among topics and concepts and the link to necessary cognitive structures that ensure student understanding in the subject.	4.46	Agree	The level of content knowledge is moderately extensive
3. Familiarity of the wide range of effective pedagogical approaches, strategies and techniques in the subject being taught.	4.35	Agree	The level of content knowledge is moderately extensive
Weighted Mean	4.38	Agree	The level of content knowledge is moderately extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50 5.00 strongly agree

The data above corroborate that the participants predominantly agree on the student teacher’s level of content knowledge in terms of applied content knowledge. Studies have found that preparing pre-service teachers should have involved the knowledge to create and share meaningful learning experiences based on their understanding of central topics, tools of inquiry, and the structures of the discipline s/he is expected to teach (Stepniak, 2020). Teachers who are highly knowledgeable in a specific field tend to be more effective teachers (Edglossary, 2016).

2.2 Research-Based Knowledge

Table 4 exhibits the student teachers’ content knowledge in terms of research-based knowledge.

Table 4
Mean distribution of the student teachers’ level of content knowledge in terms of research-based knowledge

Indicators	Mean	Description	Interpretation
1.Refinement of search strategy and subsequently extracting, recording and managing the information collected.	4.27	Agree	The level of content knowledge is moderately extensive
2.Being aware of the significance of the originality of work and the implication of committing plagiarism.	4.63	Strongly Agree	The level of content knowledge is very extensive
3.Checking on facts and seeking additional information about the lesson before presenting it to class.	4.62	Strongly Agree	The level of content knowledge is very extensive
Weighted Mean	4.51	Strongly Agree	The level of content knowledge is very extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50 5.00

As presented in the table, indicator number two (2) that states that being aware of the significance of the originality of work and the implication of committing plagiarism garnered the highest mean of 4.63. This implies that the level of student teachers’ content knowledge is very extensive. On the other hand, indicator number one (1) which indicates refinement of the search strategy and subsequently extracting, recording, and managing the information collected accumulated the lowest mean of 4.27, when compared to the other indicators, meaning that the level of research-based knowledge of the participants in this case is moderately extensive. The overall weighted mean is 4.51 or strongly agree which is described as very extensive. The data entail that the student teachers’ level of content knowledge in terms of research-based knowledge is very extensive. Thus, student teachers are knowledgeable in terms of content pertaining particularly to research. Studies have found that having research-based knowledge helps students to be lifelong inquirers and learners (Elliott, 2021).

Table 5 presents the student teachers’ content knowledge in terms of research ICT knowledge.

Table 5
Mean distribution of the student teachers’ level of content knowledge in terms of ICT knowledge

Indicators	Mean	Description	Interpretation
1.Exposing pupils to several practice activities using the technology (e.g. interactive games such as Kahoot, Wheel of Names, etc).	4.41	Agree	The level of content knowledge is moderately extensive
2.Innovating e-materials for classroom use.	4.47	Agree	The level of content knowledge is very extensive
3.Involvement of ICT in assignments to encourage pupils to display their skills in oral presentation, making videos, etc.	4.39	Agree	The level of content knowledge is moderately extensive
Weighted Mean	4.42	Agree	The level of content knowledge is moderately extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

As presented in the table, indicator number two (2) which states that innovating e-materials for classroom use garnered the highest mean of 4.47. This implies that the level of student teachers' content knowledge is moderately extensive. On the other hand, indicator number three (3) which indicates the involvement of ICT in assignments to encourage pupils to display their skills in an oral presentation, making videos, et cetera accumulated the lowest mean of 4.39, when compared to the other indicators, suggesting that the level of research ICT knowledge of the participants, in this case, is moderately extensive. The overall weighted mean is 4.42 or agree which means that the level of content knowledge in ICT is moderately extensive. The findings indicate that the student teachers' level of content knowledge in terms of ICT knowledge is moderately extensive. Hence student teachers are knowledgeable, particularly in content pertaining ICT.

Studies have found that at a more global level, the use of ICT for teaching and learning is associated with so-called 21st-century skills that students are expected to acquire as they enter working life. These skills consist of abilities for creative and critical thinking, problem-solving, communication and collaboration, learning and information, and ICT literacy (Ahonen & Kinnunen, 2014). Technology can empower educators as content engineers, experience designers, leaders, guides, and change experiences with students in new learning and deeper exploration content (Thomas et al., 2016).

Problem 3. Student Teachers' Level of Pedagogical Knowledge in terms of Literacy and Numeracy Knowledge, Critical Knowledge, Creative Knowledge, Linguistic, Socio-linguistic, and Classroom Communication Knowledge

Table 6 displays the student teachers' pedagogical knowledge in terms of literacy and numeracy knowledge. As presented in the table, indicator number one (1) which states that using appropriate approaches, strategies, and techniques in teaching language and communication garnered the highest mean of 4.63. This implies that the level of student teachers' pedagogical knowledge is very extensive. Meanwhile, indicator number two (2) which indicates the integration of basic mathematics in teaching language or other disciplines accumulated the lowest mean of 4.41 when compared to the other indicators, suggesting that the level of pedagogical knowledge in terms of literacy and numeracy knowledge is moderately extensive. The overall weighted mean is 4.55 or strongly agree which entails that the level of pedagogical knowledge in terms of literacy and numeracy is very extensive. Hence, student teachers are competent, particularly in pedagogical knowledge in literacy and numeracy.

Table 6
Mean distribution of the student teachers' level of pedagogical knowledge in terms of literacy and numeracy knowledge

Indicators	Mean	Description	Interpretation
1. Use of appropriate approaches, strategies and techniques in teaching language and communication.	4.63	Strongly Agree	The level of content knowledge is very extensive
2. Integration of basic mathematics in teaching language or other disciplines.	4.41	Agree	The level of content knowledge is moderately extensive
3. Practicing appropriate approaches, strategies and techniques in improving the reading skills of the pupils.	4.62	Strongly Agree	The level of content knowledge is very extensive
Weighted Mean	4.55	Strongly Agree	The level of content knowledge is very extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

According to Md-Ali et al. (2016), teachers' characteristics were established based on what the teachers perceived as important in guiding their pupils, to equip themselves with the necessary literacy and numeracy skills in order to cope with imminent educational demands and challenges. Teachers were most likely to rate their ability to teach skills including spelling, phonics, comprehension or vocabulary as either moderate or very good (Stark et al., 2016).

Table 7 shows the student teachers' pedagogical knowledge in terms of critical knowledge. As presented in the table, indicator number one (1) which states that rephrasing the question in order to be better understood by the pupils garnered the highest mean of 4.66. This implies that the level of student teachers' pedagogical knowledge is very extensive.

Table 7
Mean distribution of the student teachers' level of pedagogical knowledge in terms of critical knowledge

Indicators	Mean	Description	Interpretation
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1.Rephrasing the question in order to be better understood by the pupils.	4.66	Strongly Agree	The level of content knowledge is very extensive
2.Seeking solutions to challenging situations in class and seeking failure as an opportunity for growth in the teaching profession.	4.55	Strongly Agree	The level of content knowledge is very extensive
3.Use of some techniques that can help make difficult topics become easier for the pupils.	4.65	Strongly Agree	The level of content knowledge is very extensive
Weighted Mean	4.62	Strongly Agree	The level of content knowledge is very extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

On the other hand, the indicator number two (2) which indicates seeking solutions to challenging situations in class and seeking failure as an opportunity for growth in the teaching profession accumulated the lowest mean of 4.55 when compared to the other indicators, suggesting that the student teachers’ extent of pedagogical knowledge in terms of critical knowledge. The overall weighted mean is 4.62 or strongly agree which indicates that the level of pedagogical knowledge in terms of critical knowledge is very extensive. This further suggests that the student teachers are knowledgeable when it comes to pedagogy, particularly critical knowledge.

Pre-service teachers held positive opinions about the value of teaching critical thinking. Also, critical thinking should be enhanced to enable them to reflect on what skills they have in their future teaching duties (Gashan, 2015). It is necessary to develop a model of learning that accommodates aspects of prior knowledge, motivation, and critical thinking. In addition, the prospective teacher training becomes an appropriate period for interventions that promote critical thinking ability (Journal of Turkish Science Education, 2018).

Table 8 presents the student teachers’ pedagogical knowledge in terms of creative knowledge.

Table 8

Mean distribution of the student teachers’ level of pedagogical knowledge in terms of creative knowledge

Indicators	Mean	Description	Interpretation
1.Breaking or chunking the lessons into bite-sized units in order to make the topic comprehensible.	4.57	Strongly Agree	The level of content knowledge is very extensive
2.Turning negative incidences in class into positive moments.	4.43	Agree	The level of content knowledge is moderately extensive
3.Making use of breaks and free times to plan for great ideas that can be used in teaching.	4.35	Agree	The level of content knowledge is moderately extensive
Weighted Mean	4.45	Agree	The level of content knowledge is moderately extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

As presented in the table, indicator number one (1) which states that breaking or chunking the lessons into bite-sized units in order to make the topic comprehensible garnered the highest mean of 4.57. This implies that the level of student teachers’ pedagogical knowledge is very extensive. On the other hand, indicator number three (3) which indicates the making use of breaks and free times to plan for great ideas that can be used in teaching accumulated the lowest mean of 4.35 when compared to the other indicators suggesting that the level of pedagogical knowledge in terms of creative knowledge is very extensive. The overall weighted mean is 4.45 or agree which entails that the level of pedagogical knowledge in terms of creative knowledge is

moderately extensive. This further suggests that the student teachers are knowledgeable when it comes to pedagogy, particularly creative knowledge.

Esjeholm (2014) explained that all of the school projects examined were intended to be open-ended providing students with opportunities to be creative and develop their own solutions to the given task. The processes in the groups and the outcomes of the groups' work are analyzed with regard to technological knowledge and how this relates to the students' creativity in terms of producing genuine solutions. The use of certain types of pedagogies and teaching and learning approaches and strategies fosters the competencies or skills necessary to deal with sustainability, such as critical and creative thinking, problem-solving skills, action competence, collaboration and futures thinking, therefore creating empowered and globally-responsible citizens and professionals who can become active change agents (Cebrian & Junyent 2015).

Table 9 shows that the student teachers' level of pedagogical knowledge in terms of linguistic.

Table 9

Mean distribution of the student teachers' level of pedagogical knowledge in terms of linguistic

Indicators	Mean	Description	Interpretation
1.Application of grammatical rules in writing (script and orthography) and speaking (sounds and their pronunciation)	4.25	Agree	The level of content knowledge is moderately extensive
2.Use of phonological rules and morphological words, syntactic and semantic rules and the lexicons in speaking and writing.	4.09	Agree	The level of content knowledge is moderately extensive
3.Teaching both grammar and vocabulary interconnected, not in isolation in class.	4.20	Agree	The level of content knowledge is moderately extensive
Weighted Mean	4.18	Agree	The level of content knowledge is moderately extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

As shown in the table, indicator number one (1) states that the student teachers' application of grammatical rules in writing (script and orthography) and speaking (sounds and their pronunciation) garnered the highest mean of 4.25. This implies that the level of pedagogical knowledge in terms of linguistics is moderately extensive. On the other hand, indicator two (2) indicates that the student teachers' use of phonological rules and morphological words, syntactic and semantic rules, and the lexicons in speaking and writing accumulated the lowest mean of 4.09, when compared to the other indicators, suggesting that the level of pedagogical knowledge in terms of linguistics is very extensive. The overall weighted mean is 4.18 or agree indicating that the level of pedagogical knowledge is moderately extensive. Thus, the student teachers are knowledgeable when it comes to pedagogy, particularly linguistics.

In view of the findings, the application of grammatical rules in writing (script and orthography) and speaking (sounds and their pronunciation) can help promote Mother Tongue, Filipino, and English in teaching and learning. Language enables students to play an active role in various communities of learners within and beyond the classroom. Additionally, as students speak, write, and represent, they also listen to, read, and view the ideas and experiences of others. Buffalo (2023) stated that the use of linguistic concepts in the classroom to help students improve their ability to communicate in their native language or a second language.

Mcquerrey (2018) posited that linguistics helps teachers convey the origins of words and languages, their historical applications, and their modern day relevance. Combined, this approach to teaching language helps students gain a better, more in-depth understanding of their assignments and work product expectations. Additionally, Chomsky (2023) held that the basic principles of all languages, as well as the basic range of concepts they are used to express, are innately represented in the human mind and that language learning consists of the unconscious construction of a grammar from these principles in accordance with cues drawn from the child's linguistic environment. The study of how languages change over time (University of California, 2023).

Table 10 shows the student teachers' level of pedagogical knowledge in terms of sociolinguistics. As shown in the table, indicator number two (2) which states that the student teachers' sensitivity to differences in the dialect or variety of language garnered the highest mean of 4.42. This implies that the level of pedagogical knowledge in terms of sociolinguistics is moderately extensive. On the other hand, indicator one (1) which indicates that the student teachers' use of appropriate linguistics function (used of language in expressing, informing, direction, etc.) and their varieties in language use context accumulated the lowest mean of 4.36, when compared to the other indicators suggesting that the level of pedagogical knowledge in terms of sociolinguistics is very extensive. The overall weighted mean is 4.38 or agree which means that the level of pedagogical

knowledge in terms of sociolinguistics is moderately extensive. Thus, the student teachers are knowledgeable when it comes to pedagogy, particularly sociolinguistics.

Table 10

Mean distribution of the student teachers' level of pedagogical knowledge in terms of sociolinguistic

Indicators	Mean	Description	Interpretation
1. Use of appropriate linguistics function (used of language in expressing, informing, directing, etc.) and their varieties in language use context.	4.36	Agree	The level of content knowledge is moderately extensive
2. Sensitivity to differences in the dialect or variety of language.	4.42	Agree	The level of content knowledge is moderately extensive
3. Giving of interpretation of cultural references, figure of speech, idioms and etc.	4.37	Agree	The level of content knowledge is moderately extensive
Weighted Mean	4.38	Agree	The level of content knowledge is moderately extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

University of Sheffield (2023) cited that sociolinguistics is concerned with how language use interacts with, or is affected by, social factors such as gender, ethnicity, age, or social class, for instance. Also, development of the appropriate reading and writing programs could help educators reach the needs of students who speak non-standard varieties of the language (Levin, 2022). Sociolinguistics have a great and direct impact on language teaching and mainly focused their attention on how language is used appropriately in varying contexts (Scientific Research, 2023).

Table 11 shows the student teachers' level of pedagogical knowledge in terms of classroom communication knowledge.

Table 11

Mean distribution of the student teachers' level of pedagogical knowledge in terms of classroom communication knowledge

Indicators	Mean	Description	Interpretation
1. Use of activities that can encourage pupils to communicate with and among others (Group work, Think, Pair and Share, Games, etc).	4.67	Strongly Agree	The level of content knowledge is very extensive
2. Encourage the pupils to be sensitive about the needs of the classmates, teacher, guests, etc.	4.61	Strongly Agree	The level of content knowledge is very extensive
3. Encourage pupils to take opportunities for peer teaching and peer assessment.	4.60	Strongly agree	The level of content knowledge is very extensive
Weighted Mean	4.63	Strongly agree	The level of content knowledge is very extensive

Range of Means: 1.00-1.49 strongly disagree; 1.50-1.2.49 disagree; 2.50-3.49 moderately agree; 3.50-4.49 agree; 4.50-5.00

As shown in the table, indicator number one (1) which states that the student teachers' use of activities that can encourage pupils to communicate with and among others (group work, think, pair and share, etc.) garnered the highest mean of 4.67. This implies that the level of pedagogical knowledge in terms of classroom communication strategies is very extensive. On the other hand, indicator three (3) which indicates that the student teachers encourage pupils to take opportunities for peer teaching and peer assessment accumulated the lowest mean of 4.60, when compared to the other indicators, suggesting that the level of pedagogical knowledge in terms of communication strategies is very extensive. The overall weighted mean is 4.63 or strongly agree, suggesting that the level of pedagogical knowledge is very extensive. Thus, the student teachers are knowledgeable when it comes to pedagogy, particularly communication strategies.

Furthermore, it shows that using activities that can encourage pupils to communicate with and among others can help promote classroom communication. This can help to build a student's confidence, create a good rapport and supportive

environment. Additionally, students will naturally develop communication skills but some will do so more gradually than others as they may have a fear of speaking in front of a group or lack confidence in what they have to say. Climans (2021) mentioned that effective classroom communication is the basis of good educational outcomes. Studies confirm that teachers who communicate better lead classes to better grades and retention rates, while higher dropout rates are partially attributable to poor classroom communication.

Moreover, effective classroom communication is the basis of good educational outcomes. It's one that can help overcome in-class impediments to learning, such as poor attitudes or fractured relationships between teachers and students, helping to create bilateral communication environments centered on the pursuit of understanding rather than expression of conflict (Rise Vision, 2021). The effective classroom communication will bring successful teaching and learning process (Atlantis Press, 2023).

Problem 4. Significant Relationship between the Student Teachers' Level of Content Knowledge and their Extent of Pedagogical Knowledge

Table 12 shows the relationship between the student teacher's level of content knowledge and their extent of pedagogical knowledge.

Table 12
Significant relationship between the student teachers' level of content knowledge and their extent of pedagogical knowledge

Variable 1	Variable 2	r-value	p-value	Decision	Significant
Student teachers' level of content knowledge	Extent of pedagogical knowledge	.718	.000	Reject Ho	Significant

Correlation is significant at 0.05 level (2-tailed)

As shown in the table, the computed p-value is 0.000. Thus, the null hypothesis is rejected. The result reveals that there is a significant relationship between the student teachers' level of content knowledge and their extent of pedagogical knowledge. This implies that when dealing with pupils in a clear, coherent, and concise way can help promote content knowledge by ensuring that student teachers are being assessed on their content knowledge and their extent of pedagogical knowledge rather than on dealing without any strategies.

To ensure quality education, teachers must master the 'content knowledge' body of knowledge composed of facts, theories, principles, ideas, vocabulary they teach, as well as the appropriate pedagogy for teaching it. UNESCO (2022), claims that good quality education depends to a certain extent on giving teachers the best possible training, before and throughout their careers. Yet, for professional development opportunities to be effective, the content must be relevant, adapted to teachers' needs, ongoing, participatory, school-based, and collaborative; teacher educators –trainers must have relevant teaching experience knowledge; teachers themselves must be encouraged, motivated and willing to employ the knowledge and skills learned inside the classroom.

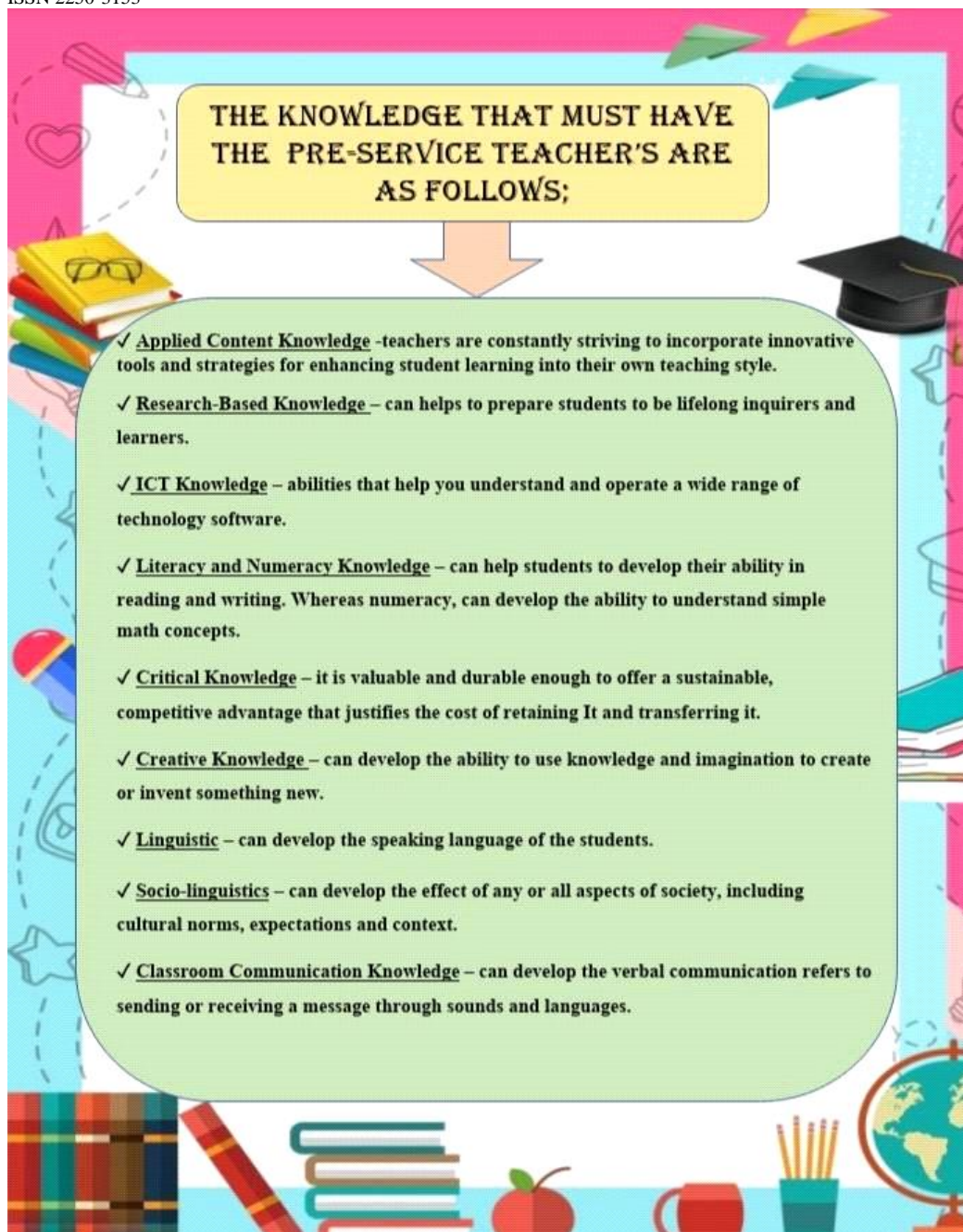
Problem 5. Pre-exit Training Program Developed

It was shown that the participants' level of content knowledge has a significant relationship with their extent of pedagogical knowledge. Hence, the researchers designed a brochure containing information about the kinds of must-have-knowledge that the pre-service teachers in their training program should possess.

Flyer Description

This brochure can help the pre-service teachers on what skills or knowledge they must have in times of their training program. This kind of knowledge mentioned in the brochure is very significant among the pre-service teachers so they can learn some tips for managing and teaching properly their students. The IM bears colorful designs and it includes many information offered to the student teachers.

Figure 3. Intervention Material for Beginning Teacher



IV. CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn.

Most of the student teachers are female and they are from Bachelor of Education major in Science with a very good GPA. As to the student teachers content knowledge, they are moderately extensive particularly on the three components namely applied content knowledge, research based knowledge and ICT knowledge. Student teachers need to assess their content knowledge so that they can improve the points in which they are found weak. However, in the study, the student teachers are found to have very good level of content knowledge but still there are components under this type of knowledge that they need to improve on. It is important for pre-service students to understand and promote their content knowledge for they are useful when they will be practicing their profession in the field. Meanwhile, the student teachers' extent of pedagogical knowledge is very extensive in terms of the four components including strategies for promoting literacy and numeracy, strategies for developing critical and creative thinking, as well as other higher-order thinking skills, Mother Tongue, Filipino and English in teaching and learning and classroom communication strategies. Their pedagogical knowledge may be very extensive but they still have to maintain and nurture such extent or level for they are helpful competences in their respective fields.

Moreover, the student teachers' level of content knowledge is associated with their pedagogical knowledge, suggesting that when the former tends to rise, the latter will follow. Further to this, when student teachers master their subject matters or lessons, it will be easy for them to explore different strategies in teaching the pupils.

A flyer was made based on the findings of the study. It contains basic information about the kinds of must-have-knowledge that the pre-service teachers in their training program should possess. They can be useful among student teachers for they will soon become beginning teachers when given the opportunity to be employed in public or private schools.

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