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PEDAGOGICAL CONTENT KNOWLEDGE AND PERSONAL ATTRIBUTES OF MATHEMATICS TEACHERS

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Abstract

The study investigated the self-perceived pedagogical content knowledge, personal attributes, and attitudes of Mathematics teachers toward teaching Mathematics. Most of the respondents were between 33-42 years old and females; married; have only their bachelor's degree and do not pursue graduate studies; with between 6 – 10 years in service and are all licensed professional teachers; experienced to handle one year level only and teach Mathematics subject. They believed that they have the right attitude and sufficient pedagogical content knowledge which they apply in teaching.

There was a significant relationship between the self–perceived attitudes of Mathematics teacher-respondents and their content knowledge, pedagogical knowledge, and pedagogical content knowledge. There was also a significant influence of teachers' attitudes toward teaching Mathematics on their content, pedagogical and pedagogical content knowledge.

This study suggested that regardless of the profile of a teacher, one can be as effective and efficient with the help of positive and right attitudes. Attitudes and pedagogical content knowledge are quite related to each other since if a teacher posted a positive attitude towards teaching, he/she is likely to develop his or her pedagogical content knowledge in teaching Mathematics subjects or the other way around. Also, attitudes like self-confidence, success, comfort, motivation, and value influence and affect the pedagogical content knowledge of Mathematics teacher–respondents.

Keywords:
content knowledge (CK); pedagogical knowledge (PK); pedagogical content knowledge (PCK); attitude; enjoyment; anxiety; motivation; self-confidence; success; value

1. INTRODUCTION

It is said that teaching is an art and, in this art, the key person in the teaching-learning scenario is the teacher for he/she is the manager, director, and facilitator of learning. This is true regardless of his/her educational level because his/her primary objective of teaching is to promote and facilitate learning. For learning to take place, teachers have to teach and make the students learn. The teaching act is an interplay of a constellation of personality traits in teaching competencies, knowledge of the subject taught, the theories the teacher holds about learning as well as his/her assumption of the learners' individual differences which spring them for teachers to have different teaching styles (Stronge, 2007).

The basic question on Mathematics instruction remains simple. What are the expected characteristics of a good teacher? To answer this, it may be said that content knowledge and pedagogical knowledge are of paramount importance to teaching. Before anyone can be called an expert teacher, he/she must possess proficiency in the subject matter. No one can impart something he does not have. However, mere knowledge of the content and general pedagogy are certainly not the only ones expected of teachers.

2. METHODOLOGY

A sample consisting of 141 teachers who are handling Mathematics subject in the Junior High School of the big schools in the Fourth Congressional District of Nueva Ecija for the school year 2018-2019.
Data collection sources
Primary data
A questionnaire is administered to the 141 respondents and primary data is extracted by this method.
Secondary data
Secondary data is collected through articles, websites etc.
Limitations of the study:
- Sample size and locale of the study are limited
- Time is a major constraint

3. RESULTS AND DISCUSSION

Table: 1
Age of the respondents

23-27	28-32	33-37	38-42	43-47	48-52	53-57	58-62	63-67
11	17	24	24	20	19	19	6	1

It is evident that out of 141 respondents one is between 63-67 years old, six are between 58-62 years old, nineteen are between 53-57 years old, also, nineteen are between 48-52 years old, twenty are between 43-47 years old, twenty-four are between 38-42 years old, twenty-four are between 33-37 years old, seventeen are between 28-32 years old and eleven between 23-27 years old. This implies that most of the mathematics teacher-respondents are between 33-42 years old.

Table: 2
Gender of the respondents

Male	Female
27	114

From the above table, it is found that from the total of 141 respondents most of them are female. This implies that most of the mathematics teachers in public high schools in Congressional District 4 of Nueva Ecija are female and more females are interested and predominant in the teaching profession than males.

Table: 3
Civil Status of the respondents

Single	Married	Widowed
33	105	3

From a total of 141 respondents, thirty-three are single, one hundred five are married and three are widowed. This implies that most of the mathematics teacher-respondents are married. The general impression is that married teachers are more patient in teaching than unmarried ones. However, the difference between the scores of the students was not significant, but the difference between the scores of the unmarried and married teachers on one hand and the divorced, on the other hand, was significant. Thus, the separated and divorced teachers negatively impacted the students' academic achievement in the English language, while the single and married teachers positively impacted students' academic achievement. However, Ayeop (2003) posited that married teachers have higher satisfaction in their job.

Table: 4
Highest educational attainment of the respondents

Bachelor's Degree	Masteral Undergraduate	Masteral Graduate	Doctoral Undergraduate	Doctoral Graduate
63	54	20	1	3

From the above table, it is evident that sixty-three of the respondents are bachelor's degree holders only, fifty-four are masteral undergraduate, twenty or 14.2 are masteral graduates, only one is a doctoral undergraduate and only three of the respondents are doctoral graduates. The data implies that teachers are still in the early steps of their education. They still have time ahead of them to gain more knowledge and grow professionally

Table: 5
Years of teaching experience

1-5 years	6-10 years	11-15 year	16-20 year	21-25 year	26-30 year	31-35 year	36-40 year
		s	s	s	s	s	s
20	38	23	22	14	13	10	1

Twenty or 14.2 of the respondents are between 1-5 years in teaching, thirty-eight are between 6-10 years in teaching, twenty-three are between 11-15 years in teaching, twenty-two are between 16-20 years in teaching, fourteen are between 21-25 years in teaching, thirteen are between 26-30 years in teaching, ten or 7.1% are between 31-35 years in teaching and only one is between 36-40 years in teaching. This suggests that most of the mathematics teachers in Congressional District 4 of Nueva Ecija are teaching between 6-10 years. In the study by Unal (2012), the impact of years of teaching experience on the classroom management approaches showed that attitudes toward classroom management are based on the years of teaching.

Table: 6
Eligibility of the respondents

LET/PBET	LET/PBET and CSC/Engineering Board
136	5

It is shown by the table that one hundred thirty-six of the respondents are licensed professional teachers and only five are licensed professional teachers and Civil Service professionals or registered engineers at the same time. This implies that all of the mathematics teacher-respondents are qualified to teach the subject. Since they are all qualified to teach the subject, they are expected to perform their teaching functions effectively and efficiently.

Table: 7
Year level taught of the respondents

One year level	Two-year levels	Three-year levels	Four-year levels
103	29	6	3

Out of 141 respondents, one hundred three taught one-year levels only, twenty-nine handled two-year levels, six taught three-year levels and three handled four-year levels. This implies that most of the mathematics teachers in Congressional District 4 of Nueva Ecija handled only one year level. This also implies that they are more focused on the content of the curriculum guide for the year level they handled.

Table: 8
Subjects handled by the respondents

Mathematics Only	Mathematics and other subjects
116	25

From the total of 141 respondents, one hundred sixteen are handling Mathematics subject only and twenty-five are handling Mathematics along with other subjects. This data suggests that most of the mathematics teachers in Congressional District 4 of Nueva Ecija are handling the subject they majored in their bachelor's degree and are able to focus on the subject itself.

Table: 9
Summary of Attitudes Toward Teaching Mathematics

	Attitude In terms of:	Mean	Verbal Interpretation	Rank
1	**Value**	4.74	Strongly Agree	**1**
2	**Enjoyment**	4.15	Agree	**4**
3	**Self-confidence**	4.06	Agree	**5**
4	**Motivation**	4.48	Strongly Agree	**2**
5	**Success**	4.44	Strongly Agree	**3**
6	**Anxiety**	1.80	Disagree	**6**
	Average Mean	**3.94**	***Agree***	

It is shown in the table that the respondents have a high value on the subject with 4.74. Respondents also strongly agreed that Mathematics is useful even outside the school and it is the most important subject that anyone can teach. It suggests that respondents strongly agreed that mathematical skills are worthwhile and necessary. Schenkel (2009) maintains that attitudes towards Mathematics represent a like or dislike of the subject and they embrace beliefs, abilities, and views on the usefulness of mathematics. It is aligned with the present study that teachers had high regard for the usefulness and importance of Mathematics.

Respondents agreed that the subjects brought enjoyment to them with an overall mean of 4.15. Mathematics was viewed as an interesting and enjoyable subject by the respondents. They also have enthusiasm, feel secure and happy in teaching the subject. They disagree that the subject is dull and boring. This data implies that mathematical problem-solving and challenges are enjoyable. Studies and qualitative interviews indicate a relationship between teachers' enjoyment of teaching and students' enjoyment of the learning process. In addition, the teacher's passion for teaching affects students' interaction with the lesson and increases their enjoyment during class time (Witt, Wheeless, & Allen, 2004). However, there is a paucity of research that demonstrates the relationship between the teacher's enthusiasm and enjoyment of teaching and students' passion for learning. It is generally believed that if you enjoy what you are doing, you are able to do it efficiently and effectively.

Mathematics teachers agree that they are confident enough to teach the subject with an overall mean of 4.06. The data implies that Mathematics teacher-respondents believe and are confident that they are capable of teaching the subjects. Teachers' expectations about doing well and how easily Mathematics is mastered have a high extent. Some studies do provide insight into the relevance of self-confidence for teaching and teacher development. In one study, two teachers, who were given the lowest rating by students in a law school, were interviewed and observed before and after a program for improving instruction (Hativa, 2000). Low self-confidence in teaching ability was outlined as a key trait of one of the teachers in the study. However, the findings can only be considered as being preliminary due to the use of only two participants from the same subject area and teaching context. Äkerlind (2003) identified one way that development was experienced was as an increase in comfort, confidence, and ease of teaching. This provides a slightly different perspective on the role of confidence in teaching, but it does indicate that confidence is an important dimension for development regardless of an individual's conception and approach to teaching. Therefore, the aim of the current study was to assess and determine the level of self-confidence of Mathematics Teacher-respondents regarding the teaching process and Mathematics instruction.

It can be shown in the table that the motivation of the respondents to develop their mathematical skills is great with a mean of 4.70. This implies that once they are challenged, they are willing to learn and do more to be able to surpass the challenge that Mathematics gives them. The desire to learn more about Mathematics and to teach the subject to their students are their motivations as they pursue a teaching career. Satisfied and motivated teachers also improve students' motivation and attainment (Nguni, Sleegers, & Denessen, 2006) and make it more likely that educational aims and work goals are achieved.

Mathematics teachers strongly agreed that the subject brings success with an overall mean of 4.44. Studies have shown that teachers' beliefs about Mathematics teaching and learning are mostly formed during their own schooling and are developed as a result of their own experiences as mathematics students. Results suggest that Mathematics can bring out success in any other field or area Math is a part of people's daily lives. Understanding how a car functions or interacts with fractions while making a favorite recipe involves Math, yet Tobias, (1993) stated "people who don't know what Math is don't know what Math isn't. Therefore, fear of Math may lead them to avoid all manner of data and to feel uncomfortable working with things".

Anxiety is considered one of the negative attitudes or beliefs in terms of Mathematics. Respondents disagree that they feel anxiety towards teaching Mathematics as evidenced by the low means given to the eighteen statements for anxiety. They also do not feel nervous, confused, uncomfortable, or insecure in dealing with the subject. The data also give strong proof that the teachers really love the subject which is why they chose to pursue the teaching of the subject. This suggests that the respondents really enjoy teaching Mathematics and do not feel anxious or negative about teaching the subject. Ashcraft and Kirk (2001) stated that before a student is able to feel success in Mathematics, he must believe in his ability to understand the subject matter and be able to construct the meaning of numbers. The opportunity of learning the basics of Mathematics takes place around adults in the home environment and progress in the school environment as they see their teachers doing Mathematics. As for the findings, teachers with a low level of anxiety are likely to influence their students to feel anxious also.

Overall, the table revealed that the value has the highest mean of 4.47 and anxiety has the lowest mean of 1.80. This means that Mathematics teacher-respondents have high regard for the usefulness and importance of the subject. Motivation and success also follow with high means of 4.48 and 4.44, respectively. This suggests that teachers are highly motivated to learn. They teach Mathematics because they believe that it brings success not only to their profession but also to their students. Teacher-respondents also gave a high mean of 4.15 to enjoyment and 4.06 to self-confidence. It implies that teachers find enjoyment in teaching the subject as they deal with mathematical problems and challenges. This result can somehow show that teacher-respondents value personal growth and professional development. They also exhibit high personal regard for the teaching profession by maintaining qualities that uphold the

dignity of teaching such as a caring attitude, respect, and integrity which is one of the domains stated in the Philippine Professional Standards for Teachers (PPST).

Table: 10
Content Knowledge of Mathematics Teachers

Statement	Weighted Mean	Verbal Interpretation
1. I have sufficient knowledge about Mathematics.	4.04	Agree
2. I can use a mathematical way of thinking.	4.04	Agree
3. I have various ways and strategies of developing my understanding of Mathematics.	4.04	Agree
4. I reason mathematically when I solve problems in my daily life.	3.81	Agree
5. I can make mathematical connections with the problems outside of Mathematics.	3.84	Agree
6. I am able to communicate mathematically.	3.84	Agree
7. I use multiple mathematical representations when I solve problems.	3.83	Agree
Average weighted mean	***3.92***	***Agree***

Mathematics teacher-respondents have proficient content knowledge as shown by its mean of 3.92. It implies that the content knowledge of the mathematics teacher-respondents is sufficient and could help them solve problems not only inside the classroom but also in their day-to-day life. Ponte and Chapman (2008) stated that having a strong knowledge of Mathematics does not guarantee that one can be an effective Mathematics teacher. Teachers who do not have such knowledge are likely to be limited in their ability to help students develop relational and conceptual understanding.

Table: 11
Pedagogical Content Knowledge of Mathematics Teachers

Statement	Weighted Mean	Verbal Interpretation
1. I know how to assess student performance in a classroom.	4.35	Strongly Agree
2. I can adapt my teaching based-upon what students currently understand or do not understand.	4.21	Strongly Agree
3. I can adapt my teaching style to different learners.	4.26	Strongly Agree
4. I can assess student learning in multiple ways.	4.22	Strongly Agree
5. I am familiar with wide range of teaching approaches in a classroom setting.	4.06	Agree
6. I am familiar with common student understandings and misconceptions.	4.15	Agree
7. I know how to organize and maintain classroom management.	4.18	Agree
8. I can use a wide range of teaching approaches in a classroom setting.	4.09	Agree
Average weighted mean	***4.19***	***Agree***

Mathematics teacher-respondents have proficient pedagogical knowledge as shown by its mean of 4.19. It implies that being flexible is one of the characteristics of effective teachers needed for an effective teaching-learning process and to address the diversity and differences of the learners. It is also evident in the data that respondents know how to organize and manage classrooms and use a wide range of teaching approaches in classroom settings. According to Rodgers & Raider-Roth (2006), having pedagogical knowledge is the way to decompress the subject matter knowledge of teachers that makes this knowledge accessible to their students. This implies that teachers should not only know the content of the subject but, most importantly, know the strategies and approaches in dealing with numerous and diverse learners.

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Table: 12
Pedagogical Content Knowledge of Mathematics Teachers

Statement	Weighted Mean	Verbal Interpretation
1. I can select effective teaching approaches to guide student thinking and learning in Mathematics.	4.13	Agree
2. I have a good understanding of teaching Mathematics so that students are able to learn.	4.22	Strongly Agree
3. I have a good understanding of instructional strategies that best represent mathematical topics.	4.11	Agree
4. I have a good understanding of students' conceptual and practical understanding of mathematical concepts.	4.06	Agree
5. I have a good understanding of the mathematics curriculum that meets students' needs for learning Mathematics.	4.09	Agree
Average weighted mean	***4.12***	***Agree***

Mathematics teacher-respondents have proficient pedagogical content knowledge as shown by its mean of 4.12. This finding implies that understanding the subject allows the teacher to design, apply and evaluate a variety of strategies and techniques in presenting particular content or topic that will cater to the needs of the learners. Ball, et.al (2018) stated that

pedagogical content knowledge involves much more than just content and pedagogical knowledge. PCK involves the knowledge of content and students, as well as the knowledge of content and teaching. This combine knowing how students think and knowing about Mathematics content.

Table: 13
Content Knowledge, Pedagogical Knowledge, and Pedagogical Content Knowledge of Mathematics Teachers

Knowledge In terms of:		Weighted Mean	Verbal Interpretation
1	**Content Knowledge**	3.92	Agree
2	**Pedagogical Knowledge**	4.19	Agree
3	**Pedagogical Content Knowledge**	4.12	Agree
	Average Mean	***4.08***	***Agree***

The respondents have proficient knowledge as shown by its mean of 4.08. It can be gleaned from the table that respondents believe that they have sufficient pedagogical knowledge with a mean of 4.19, pedagogical content with a mean of 4.12, and content knowledge with a mean of 3.92. They agree that they possess the three contributory factors in teaching Mathematics effectively and efficiently. Respondents are proficient in their content, pedagogical and pedagogical content knowledge which are some of the contributory factors to effective and efficient teaching. Mathematics content knowledge, pedagogy, and pedagogical content knowledge are certainly important aspects of teaching and teacher education. Teacher education programs should also consider the pedagogical content knowledge by combining pedagogical content knowledge and general knowledge in stages to prepare a more effective teacher.

Table: 14
Relationships of Teacher's Personal Attributes and Attitudes Toward Teaching Mathematics to Content Knowledge, Pedagogical Knowledge, and Pedagogical Content Knowledge

Personal Attributes/ Attitude		Knowledge			
		Content	Pedagogical	Pedagogical Content	OVER-ALL
Age	r	.039	-.042	-.022	-.009
	p-value	.645	.621	.800	.916
Gender	r	-.057	-.108	-.040	-.075
	p-value	.502	.201	.636	.378
Civil status	r	-.018	-.098	-.078	-.070
	p-value	.833	.249	.360	.410
Educational Attainment	r	.063	.109	.099	.098
	p-value	.458	.199	.243	.249
Years of Teaching Experience	r	.099	-.014	.014	.036
	p-value	.244	.866	.873	.675
Year level taught	r	-.041	-.088	-.089	-.079
	p-value	.629	.297	.292	.351
Subjects handled	r	-.009	-.065	.011	-.023
	p-value	.916	.443	.896	.784
Value	r	**.309****	**.384****	**.327****	**.370****
	p-value	**.000**	**.000**	**.000**	**.000**
Enjoyment	r	**.410****	**.387****	**.363****	**.420****
	p-value	**.000**	**.000**	**.000**	**.000**
Self Confidence	r	**.509****	**.490****	**.480****	**.536****
	p-value	**.000**	**.000**	**.000**	**.000**
Motivation	r	**.339****	**.506****	**.459****	**.473****
	p-value	**.000**	**.000**	**.000**	**.000**
Success	r	**.418****	**.504****	**.476****	**.507****
	p-value	**.000**	**.000**	**.000**	**.000**
Anxiety	r	**-.412****	**-.540****	**-.434****	**-.503****
	p-value	**.000**	**.000**	**.000**	**.000**
OVER-ALL ATTITUDE	r	**.436****	**.459****	**.459****	**.491****
	p-value	**.000**	**.000**	**.000**	**.000**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The table shows the result of the correlation analysis made between the attributes and attitudes of Mathematics teacher-respondents and their content knowledge, pedagogical knowledge, and pedagogical content knowledge. It can be seen that the personal attributes of the respondents have nothing to do with their content knowledge, pedagogical knowledge, and pedagogical content knowledge. The hypothesis of no significant relationship is accepted. Teaching experience can only be associated with classroom management approaches. Indeed, age may not be a factor in an educator's attitude toward teaching. As one gets older, his or her attitude toward teaching might be associated either positively or negatively according to Ortega (2016). Ortega's study is contradictory to studies that have shown that teachers' gender has a role in the effectiveness of teachers. According to Norlander – Case, Regan, and Case (1999) women tend to perform better in teaching than their male counterparts. On the other hand, it can be gleaned from the data that the attitudes of the respondents in terms of value, enjoyment, self-confidence, motivation, success, and anxiety are all significantly correlated to content knowledge, pedagogical knowledge, and pedagogical content knowledge.

The same table reveals that value has a strong correlation of .309** with content knowledge, which has a significant level of less than 0.01. Additionally, the value has a strong correlation of .384** with pedagogical knowledge and .327** with pedagogical content knowledge, which has a significant level of less than 0.01. Overall, the value has a correlation of .370** to the three knowledge, which has a significant level of less than 0.01. A strong correlation of .410** with content knowledge and enjoyment existed, which has a significant level of less than 0.01. Additionally, enjoyment has a strong correlation of .387** with pedagogical knowledge and .363** with pedagogical content knowledge, which has a significant level of less than 0.01. Overall, enjoyment has a correlation of .420** to the three knowledge, which has a significant level of less than 0.01.

Also, a strong correlation of .509** with content knowledge and self-confidence existed, which has a significant level of less than 0.01. Additionally, self-confidence has a strong correlation of .490** with pedagogical knowledge and .480** with pedagogical content knowledge, which has a significant level of less than 0.01. Overall, self-confidence has a correlation of .536** to the three knowledge, which has a significant level of less than 0.01.

Results also revealed that motivation has a strong correlation of .339** with content knowledge,

which has a significant level of less than 0.01. Additionally, motivation has a strong correlation of .506** with pedagogical knowledge and .459** with pedagogical content knowledge, which has a significant level of less than 0.01. Overall, motivation has a correlation of .473** to the three knowledge, which has a significant level of less than 0.01.

It can also be seen that success has a strong correlation of .418** with content knowledge, which has a significant level of less than 0.01. Success has also a strong correlation of .504** with pedagogical knowledge and .476** with pedagogical content knowledge, which has a significant level of less than 0.01. Overall, success has a correlation of .507** to the three knowledge, which has a significant level of less than 0.01.

Lastly, a strong correlation of -.412** with content knowledge and anxiety existed, which has a significant level of less than 0.01. Additionally, anxiety has a strong correlation of -.540** with pedagogical knowledge and -.434** with pedagogical content knowledge, which has a significant level of less than 0.01. Overall, anxiety has a correlation of -.503** to the three knowledge, which has a significant level of less than 0.01.

Overall, the attitude of the teacher-respondents has a strong correlation of .436** with content knowledge, which has a significant level of less than 0.01. Additionally, it has a strong correlation of .459** with pedagogical knowledge and .459** with pedagogical content knowledge, which has a significant level of less than 0.01. It has a strong correlation of .491** to the three knowledge, which has a significant level of less than 0.01.

Thus, given the findings above, the null hypothesis of no significant relationship between teachers' attitudes towards teaching Mathematics to content, pedagogical and pedagogical content knowledge is rejected. This warrants the researcher to conclude that attitude is significantly related to the content knowledge, pedagogical knowledge, and pedagogical content knowledge of the respondents. This signifies that the more positive the attitude of a Mathematics teacher is, the better he/she can teach mathematics. If teachers are motivated and enjoy what they are doing, they are more like to willingly enrich their knowledge in the different aspects. If they feel confident and do not feel anxiety in teaching the subjects, they are more likely to understand and influence their student to learn. Barlow and Reddish (2006) agreed with this idea and stated, "Beliefs and attitudes impact practices because these affects how teachers see their students, how they view the practices of other teachers, and how they accept the ideas given to them to develop practice". Importantly, attempts to change the practice of teachers must involve a change in their beliefs.

In summary, this controversy about teacher quality or teacher effectiveness can be tied to differences related to philosophies and measurability around teaching performance and its relationship with student achievement. Talbert-Johnson (2006) has made another strong statement that the knowledge and skills of educators are important but do not fail to mention intangibles such as care for students, efficacy, enthusiasm, and a caring and affirming disposition to all students. By this statement, Talbert-Johnson meant that content knowledge is not the only measure for justifying that a teacher is highly-qualified.

Table: 15
Influence of Personal Attributes and Teachers' Attitudes Toward Teaching Mathematics in Content Knowledge

Predictors	R	R Square	% of R Square	F	p-value	Interpretation
Self-Confidence	0.509	.259	25.87	48.510	.000	Significant
Self-Confidence, and Value	0.541	.292	29.25	6.584	.011	Significant

The table reveals that the predictors of content knowledge are self-confidence and self-confidence and value. As can be seen in the table, self-confidence yielded R2 = .259, F = 48.510, and p is less than the .01 significance level. Self-confidence had a significant influence on the teachers' content knowledge. Also, self-confidence and value produced R2 = .292, F = 6.584 and p is less than .05 significance level. Self-confidence and value had a significant influence on the teachers' content knowledge. The result implies that content knowledge is significantly better with self-confidence and value rather than without self-confidence and value. Thus, given the findings above, the null hypothesis of no significant influence of teachers' attitude toward teaching Mathematics to content knowledge is rejected.

Table: 16
Influence of Personal Attributes and Teachers' Attitudes Toward Teaching Mathematics in Pedagogical Knowledge

Predictors	R	R Square	% of R Square	F	p-value	Interpretation
Anxiety	0.54	.292	29.16	57.212	.000	Significant
Anxiety, and Motivation	0.631	.398	39.81	24.431	.000	Significant
Anxiety, Motivation, and Success	0.645	.415	41.55	4.062	.046	Significant

The table reveals that the predictors of pedagogical knowledge are anxiety, anxiety and motivation, and anxiety, motivation and success. As can be seen in the table, anxiety is R2 = .292, F = 57.212, and p is less than the .01 significance level. Anxiety has a significant influence on the teachers' pedagogical knowledge. Anxiety and motivation yielded R2 = .398, F = 24.431 and p is less than .01 significance level. Anxiety and motivation have a significant influence on the teachers' pedagogical knowledge. Also, anxiety, motivation, and success yielded R2 = .415, F = 4.062, and p is less than the .05 significance level. Anxiety, motivation, and success have a significant influence on the teachers' pedagogical knowledge. The result implies that pedagogical knowledge is significantly better with comfort, motivation, and success rather than without these three attitudes

Table: 17
Influence of Personal Attributes and Teachers' Attitudes Toward Teaching Mathematics in Pedagogical Content Knowledge

Predictors	R	R Square	% of R Square	F	p-value	Interpretation
Self-Confidence	0.48	.230	23.03	41.598	.000	Significant
Self-Confidence, and Success	0.535	.286	28.62	10.807	.001	Significant
Self-Confidence, Success, and Anxiety	0.562	.316	31.61	5.993	.016	Significant

It can be gleaned from the table that the predictors of pedagogical content knowledge are self-confidence, self-confidence and success, and self-confidence, success, and anxiety. As can be seen in the table, self-confidence yielded R2 = .230, F = 41.598, and p is less than the .01 significance level. Self-confidence has a significant influence on the teachers' pedagogical content knowledge. Self-confidence and success yielded R2 = .286, F = 10.807 and p is less than .05 significance level. Self-confidence and success have a significant influence on the teachers' pedagogical content knowledge. Also, self-confidence, success, and anxiety produced R2 = .316, F = 5.993 and p is less than the .05 significance level. Self-confidence, success, and anxiety have a significant influence on the teachers' pedagogical content knowledge. The result implies that pedagogical content knowledge is significantly better with Self-confidence, success, and comfort rather than without these attitudes. Moreover, the following indicators suggested the idea that teachers' attitudes and beliefs have something to do and can influence the level of their content, pedagogical and pedagogical content knowledge

Conclusion

The majority of the mathematics teacher-respondents are between 33-42 years old and females; married; have only their bachelor's degree and do not pursue graduate studies; with between 6 – 10 years in service and are licensed professional teachers; experienced to handle one year level only and teach Mathematics subject.

The teacher-respondents possess necessary attitudes like value, enjoyment, self-confidence, motivation, success, and comfort towards teaching Mathematics that will greatly contribute to the transference of Mathematics knowledge and skills. The mathematics teacher-respondents content knowledge, pedagogical knowledge, and pedagogical content knowledge are very useful combinations to deliver and address the needs of students in learning Mathematics subject. These three types of knowledge should be applied in teaching the subject.

There is a significant relationship between the self-perceived attitudes of Mathematics-teacher respondents and their content knowledge, pedagogical knowledge, and pedagogical content knowledge. There is a significant influence of teachers' attitudes toward teaching Mathematics on their content, pedagogical and pedagogical content knowledge. Self-confidence, success, comfort, motivation, and value of Mathematics teacher-respondents really influence and affect their content, pedagogical and pedagogical content knowledge.

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