

Epistemological Beliefs, Academic Performance and Teaching Competence of Pre-Service Teachers

Asia Pacific Journal of
Multidisciplinary Research
Vol. 5 No.2, 114-124
May 2017
P-ISSN 2350-7756
E-ISSN 2350-8442
www.apjmr.com

Rudolf T. Vecaldo (EdD)
Cagayan State University, Philippines
rudolfvecaldo@gmail.com

Date Received: September 30, 2016; Date Revised: April 27, 2017

Abstract - This study aimed to examine the interplay of epistemological beliefs, academic performance and teaching competence of pre-service teachers. Specifically, it determined the pre-service teachers' beliefs on the nature of knowledge and learning, their academic performance along general education, professional education and major subjects, and their teaching competence along the domains of the National Competency-Based Teacher Standards. Descriptive correlational research design was employed in the study. The study revealed that the pre-service teachers hold mature epistemological beliefs, have satisfactory academic performance, and are competent in teaching. Specialization of pre-service teachers spells out differences in epistemological beliefs and academic performance and significant variations in their academic performance were also attributed to their program. Correlations indicated that pre-service teachers with mature epistemological beliefs have better academic performance and regression showed that factors of epistemological beliefs, except for quick learning predicted the academic performance and teaching competence of pre-service teachers.

Keywords: epistemological beliefs, academic performance, teaching competence, pre-service teachers, Teacher Education Institutions

INTRODUCTION

All efforts to improve the quality of education in the Philippines are dependent on the service of teachers who are fully equipped to undertake the many-sided functions of educating the citizens. Subsequently, the Teacher Education Institutions (TEIs) in the Philippines are mandated to provide quality and relevant experience to prospective teachers. The Commission on Higher Education (CHED) accentuates, "Quality pre-service teacher education is the key factor in Philippine education" [1]. Teacher education programs are expected to ensure that the training tailors to the pressing needs of the Filipino learners and the demands of society in general; hence, according to Diaz [2] "proper preparation of pre-service teachers is a defining component of quality Philippine education".

In this context, the delineation of a well-designed and high-quality teacher education program is evident through the lens of the pre-service teachers who greatly manifest strong indications of the yearning to learn and making others learn. The desire to learn in various ways is best understood under the concept of epistemological beliefs, which focus on the nature of

knowledge and learning. Epistemological beliefs significantly frame learners' performance. Fang [3] and Stuart and Sturlow [4] posit that individual's beliefs on knowledge, learning and teaching are highly interdependent and they are connected to actions in the classroom. Studies of Chai [5], Abdelraheem [6] and Yilmaz and Sahin [7] also reported that beliefs could interact and affect teachers' practice and learning and pedagogical decision making [8]. Besides, going directly through the process of learning is clearly understood through the analysis of academic performance because according to March [9] students' learning goals are regularly a result of academic progress and making others learn is the true test of teaching competence as teachers make connections to the knowledge of students that contribute to a more holistic view of teaching [10]. In essence, uncovering those characteristics associated with epistemological beliefs, academic performance and teaching competence may help teacher education faculty proactively address instructional issues and create sound pedagogical decisions to define and characterize a proficient, effective, and efficient pre-service teacher.

The three highlighted concepts, which refer to epistemological beliefs, academic performance and teaching competence, are believed to be the discrete points that need to be intelligibly investigated to come up with a clear understanding vis-a-vis pre-service teachers' education. A number of studies revealed the interplay among them. Garcia [11] and Schommer-Aikins and Easter [12] affirm the existence of positive relationship between epistemological beliefs and academic performance; however, March [9] claims that there is insignificant relationship between epistemological beliefs and the grade point average, which is an index in describing academic progress. On one hand, studies on epistemological beliefs and teaching competence disclosed opposing views; a study found that there was a favorable relationship between them [13], but So, Lee, Roh & Lee [14] declared there was none. Between academic performance and teaching competence variables, it was found out that there is significant correlation between grade point average and teaching performance [15] but Zumwalt and Craig [16] cite that grades are not reliable indicators of performance. Based on these assertions, it can be noted that there is no existing research involving a blend of all these three variables; thus, there is a conclusive need for one to determine the areas that are not yet scrutinized and are neglected.

In sum, the results of the previously conducted studies bare the affirmation of existing relationships, contradictions, as well as gray areas; hence there is a need to undertake an in-depth research to explore further the variables by putting together epistemological beliefs, academic performance and teaching competence with the consideration of certain profile variables such as sex, program, specialization and ethnicity where there are identified conflicting findings. Moreover, in the Philippine context, there are only few researches on epistemological beliefs among pre-service teachers and only few studies considered the National Competency-Based Teacher Standards as framework in determining Filipino pre-service teachers' competence. Also, there is no identified study yet that explores the relationship between epistemological beliefs and teaching competence, which uses the domains of the National Competency-Based Teacher Standards. Predominantly, the researcher being a teacher, is intrinsically motivated to deliberately explore these concepts to assist in the identification of appropriate strategies congruent with the beliefs of pre-service

teachers to gradually give rise to a transformed teacher education framework anchored on the interests, needs and exigencies of all concerned in the educative community; thus, this study came into conception.

OBJECTIVES OF THE STUDY

The study investigated the relationship among epistemological beliefs, academic performance and teaching competence of pre-service teachers considering certain profile variables that hoped to be a significant endeavor in response to the indispensable appeal for reappraisal, understanding, and enhancement of teacher education, particularly in the area of pre-service teaching. Moreover, the study addressed issues recently identified as research gaps in need of further investigation that will generate empirical evidence on which aspects necessitate improvement and intervention. In essence, the results of this study may specifically guide the Teacher Education Institutions in their curriculum development and policy-making that gear toward quality instruction

MATERIALS AND METHOD

Research Design

The study used descriptive-correlational design since it determined primarily the relations among epistemological beliefs, academic performance and teaching competence of the pre-service teachers. It identified possible patterns of relationships that exist among variables and it measured the strength of such association.

Respondents of the Study

Data used in this study came from a survey of 464 pre-service teachers (n=232) and supervising teachers (232) in Tuguegarao City, Philippines. The first group of respondents of the study was the pre-service teachers of a state university (n= 209) and a private university (n=23) with a total sample of 232 respondents. The study utilized the sample size determination in simple random sampling to estimate the proportion with a perceived value of the population proportion assumed to be 0.30, alpha set at .05, and beta set at .05. The Bachelor of Elementary Education (BEED) and Bachelor of Secondary Education (BSED) pre-service teachers were enrolled in their Student Teaching for the second semester of the School Year 2015-2016 and were deployed in Tuguegarao City. They were identified through

stratified random sampling wherein for each stratum; the researcher assigned identification (ID) number for each sample unit in the list and then n_i ID numbers were randomly generated.

The second group of the respondents was the 232 supervising teachers of the pre-service teachers. These supervising teachers are public school teachers who acted as direct mentors of the pre-service teachers during Student Teaching. The supervising teachers served as assessors on the level of teaching competence of the pre-service teachers assigned them.

Research Instruments

The researcher utilized two sets of questionnaire. The first questionnaire included the profile of the pre-service teacher respondents and the 63-item Epistemological Beliefs Scale that was developed by Dr. Marlene Schommer-Aikins (with written permission). The Epistemological Beliefs Scale consisted of short statements covering various beliefs about knowledge and learning, which are further categorized into 12 subsets loaded into four factors, namely Factor 1 (Simple Knowledge), Factor 2(Fixed Ability), Factor 3(Quick Learning) and Factor 4 (Certain Knowledge). The pre-service teacher respondents were asked to answer on a Five-point Likert Type Scale (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree-1). The items were written in the naïve direction, which means that if the mean score is greater than the median, the less mature are the beliefs. The second questionnaire elicited the assessment of the cooperating teachers on the teaching competence of the pre-service teachers assigned to them. It was composed of performance indicators along the seven domains of NCBTS, which was developed by the TEC, DepEd and CHED. The cooperating teachers had to answer on a Four- Point Rating Scale (Very Competent=4, Competent= 3, Incompetent- 2, and Very Incompetent- 1).It was coded using the following scale: Very Competent (3.50-4.0), Competent (2.50-3.29), Incompetent (1.50-2.29), and Very Incompetent (1.0-1.49).

The mean grade of the pre- service teachers along their general education, professional education, and major subjects or content areas gauged their academic performance. This was obtained from their permanent record in the Registrar's Office of Cagayan State University and University of Saint Louis respectively. It was coded using the following scale: Excellent (95-100), Very Satisfactory (90-94.99), Satisfactory (85-89.99), Fair (80-84.99), and Poor (75-79.99).

Research Procedure

Foremost, the researcher sought approval from the Cagayan State University, University of Saint Louis and Department of Education authorities for the conduct of the study. Prior and informed consent were accomplished by the respondents to ensure compliance to ethical standards. After which, the researcher personally floated the first set of questionnaire to the pre-service teachers to determine their profile and epistemological beliefs. Two weeks before the end of practice teaching, the researcher floated the second set of questionnaire to the cooperating teachers of the pre-service teachers to ascertain the latter's teaching competence. Moreover, the academic performance of the pre-service teachers along general education, professional education and content areas or major subjects was taken from the official data of the registrars of Cagayan State University and University of Saint Louis. Due permission was sought from the concerned offices.

Data Analysis

Descriptive statistics such as frequency counts and percent were used to treat the profile variables. Mean score and median were used to describe the epistemological beliefs of the respondents. If the mean is less than the median, the data are interpreted to be 'less likely to believe'; hence, the beliefs are mature. On one hand, if the mean is more than the median, the data are interpreted to be 'more likely to believe'; hence, the beliefs are naïve. Frequency counts, percent and mean were utilized to describe academic performance whereas weighted mean was used to determine the level of pre-service teachers' teaching competence. Inferential statistics such as t- test was employed to find out if there is significant difference among epistemological beliefs, academic performance and teaching competence when grouped according to sex and program whereas one-way ANOVA was utilized to compare the variables in terms of specialization and ethnicity. Pearson Product Moment of Correlation Coefficient or Pearson- r was used to ascertain if there is a significant relationship between and among the pre-service teachers' epistemological beliefs, academic performance and teaching competence. Multiple Regression Analysis was used to identify which among the different factors of the epistemological beliefs can predict better academic performance and teaching competence of the pre-service teachers.

RESULTS AND DISCUSSIONS**Table 1. Profile of Pre-Service Teachers**

Variable	Frequency	Percent
Sex		
Male	44	18.97
Female	188	81.03
Program		
Bachelor of Elementary Education (BEEEd)	74	31.9
Bachelor of Secondary Education (BSEd)	158	68.1
Specialization		
Generalist	57	24.6
Pre-school Education	17	7.3
Biological Science	17	7.3
Physical Science	10	4.3
English	37	15.9
Mathematics	26	11.2
Technology and Livelihood Education	15	6.5
Music, Arts, Physical Education and Health	4	1.7
Social Science	33	14.2
Filipino	16	6.9
Ethnicity		
Ilokano	123	53.0
Ibanag	10	4.3
Kalinga	4	1.7
Itawes	83	35.8
Malaueg	2	.9
Tagalog	10	4.3

It is shown in Table 1 that pre-service teachers are generally female and most are Bachelor of Secondary Education (BSEd) students. This suggests that in terms of enrollment, teacher education institutions are female-dominated and BSEd is the preferred program. As regards specialization, majority are English majors in the BSEd program whereas in the BEEEd program, most of the respondents are Generalist. The data further show that when it comes to ethnicity, most of the pre-service teachers are Ilocanos.

Table 2 reveals that overall, the pre-service teachers less likely to believe in the statements on epistemological beliefs. The data plainly imply that the pre-service teachers have mature beliefs on the nature of knowledge and learning. Specifically, they less likely to believe in Fixed Ability and Quick Learning but they more likely to believe in Simple Knowledge and Certain Knowledge. This indicates that the pre-service teachers hold beliefs that knowledge is acquired and the rate of learning is

gradual. Furthermore, they believe that knowledge is simple and unchanging.

Table 2. Summary of Epistemological Beliefs of Pre-Service Teachers

Statement	Mean Score	Median	Descriptive Value
1. Simple Knowledge			
Avoid Ambiguity	16.70	15	MLB
Seek Single Answers	35.95	33	MLB
Avoid Integration	22.80	24	LLB
Depend on Authority	12.84	12	MLB
Overall	88.29	84	MLB
2. Fixed Ability			
Can't Learn How to Learn	10.09	15	LLB
Success Unrelated to Hard Work	8.47	12	LLB
Learn the First Time	8.05	9	LLB
Innate Ability	12.71	12	MLB
Concentrated Effort is a Waste of Time	4.97	6	LLB
Overall	44.30	54	LLB
3. Quick Learning			
Quick Learning	14.61	15	LLB
Don't Criticize Authority	15.89	18	LLB
Overall	30.50	33	LLB
4. Certain Knowledge			
Certain Knowledge	18.62	18	MLB
Overall	181.7	189	LLB
Epistemological Belief	2		

**Note: If Mean < Median = Less likely to believe (LLB); hence, mature. If Mean > Median = More likely to believe (MLB); hence, naïve*

Results of the study show that the pre-service teachers have mature epistemological beliefs in as much as they less likely to believe in Schommer's epistemological beliefs factors. This means that generally, the pre-service teachers have "sophisticated beliefs that appear to make it possible for them to have positive learning approaches and independent reasoning abilities that are indispensable for their academic success" [17]. This further implies that pre-service teachers who have mature epistemological beliefs are capable of performing well on the level of constructivist approach of teaching and learning, which in the long run tailor to the tenets of contemporary education advocating the use of prior knowledge, student-centered pedagogy and curriculum, facilitating learning approaches, and authentic assessment.

In an elaborate discussion, the mature epistemological beliefs of the pre-service teachers reveal that knowledge is acquired. This can be manifested by the pre-service teachers' positive beliefs on metacognition, hard work and concentrated effort. They believe that knowledge acquisition is attributed to hard work and active participation in the learning process in order to carry out effectively the academic tasks. This substantiates the findings of Wong, Chan & Lai [18] citing that pre-service teachers tend to believe that knowledge is constructed during the learning process as a result of effort.

Moreover, the mature epistemological beliefs of the pre-service teachers convey a gradual and deliberate acquisition of knowledge and the openness to challenge authority of knowledge. In other words, the pre-service teachers prefer to learn in a step-by-step scheme. They subscribe to the principle that "learning is an evolutionary process that requires time and patience" [19]. Besides, the pre-service teachers are not just teacher-directed in attaining knowledge. In the Asian context, this is supported by the findings of Cheng, Chan, Tang and Cheng [20] that among the teacher education students, most of them believe that authority of knowledge is questionable. To put it simply, knowledge is not merely handed down by authority but must be deliberately analyzed and criticized.

On the contrary, the likelihood of the pre-service teachers to believe in Simple Knowledge conveys their epistemological naivety as they deal with knowledge to be separate and isolated pieces of information rather than a network of interrelated concepts. This is congruent with the findings of Bernardo [21] about the structure of the Filipino prospective teachers' epistemological beliefs. He found out that Filipino pre-service teachers believe in Simple Learning, indicating that learning is bare, basic and uncomplicated process.

Furthermore, the naïve beliefs of pre-service teachers on the certainty of knowledge imply that

"Truth is unchanging". In other words, the respondents primarily consider that knowledge is inflexible, absolute and never-changing. The result is in contrast to the findings of Chai, Khine and Teo [22] and Cheng, Chan, Tang and Cheng [20] asserting that pre-service teachers in the Asian setting, specifically in Singapore and Hongkong, are inclined to believe that knowledge is evolving.

It can be gleaned from Table 3 that majority of the pre-service teachers have satisfactory academic performance along general education, professional education and major subjects. It is interesting to note that it is in professional education that they earned the highest mean grade.

The finding gives a clear picture that at least, the kind of teacher education students today is not necessarily weak or poor. In the past, according to Acedo [23] intakes into teacher education had low quality because students with impressive scholastic ratings chose other career paths. Nonetheless, the apparent change in the academic performance of pre-service teachers may be attributed to the Revised Policies and Standards for Teacher Education set by the Commission on Higher Education as regards the adoption and implementation of a system of selective admission and minimum retention requirements to select academically fit students.

Among the components of academic performance, the pre-service teachers had the highest mean grade in professional education subjects. This finding confirms that the pre-service teachers satisfactorily possess the range of knowledge and skills needed in the practice of the teaching profession.

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Table 3. Academic Performance of Pre-Service Teachers

Grade	Descriptive Value	General Education		Professional Education		Major	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
75.00-79.99	Poor	2	.9	1	.4	2	.9
80.00-84.99	Fair	83	35.8	60	25.9	71	30.6
85.00-89.99	Satisfactory	125	53.9	140	60.3	135	58.2
90.00-94.99	Very Satisfactory	20	8.6	31	13.4	24	10.3
≥95.00	Excellent	2	.9				
Mean Grade		86.20		86.73		86.42	
Overall Mean Grade = 86.45							

Table 4. Summary of the Level of Teaching Competence of Pre-Service Teachers along the Seven Domains of National Competency-Based Teacher Standards

Domain	Mean	Descriptive Value
Social Regard for Learning	3.56	Very Competent
Learning Environment	3.34	Competent
Diversity of Learners	3.24	Competent
Curriculum	3.36	Competent
Planning, Assessing, and Reporting	3.28	Competent
Community Linkages	3.22	Competent
Personal Growth and Professional Development	3.45	Competent
Overall Level of Competence	3.35	Competent

From the data shown in Table 4, the overall mean basically suggests that the pre-service teachers are competent along the seven (7) domains of the National Competency-Based Teacher Standards based on the assessment of their cooperating teachers during the practice teaching experience. The finding further illustrates that the pre-service teaching competence meets the required national standards as indicated in CHED Memo No. 52, Series of 2007 [24].

The BEEd and BSEd pre-service teachers are competent in teaching along the seven domains of the NCBTS as framework of evaluation. This finding is akin to the results of previous studies Somblingo [25] and Biong [26]. Corroboratively, according to Abao [27], the intensive training of the pre-service teachers during their practicum provides an avenue for the interplay of theories and practice that facilitated the pre-service teachers to acquire the fundamental aspects of teaching and to be immersed to the realities of the teaching profession.

The competent teaching performance of the pre-service teachers reflects the quality of training that they have attained from their TEIs. This fulfills the standard policy formulated by CHED and practiced in the TEIs, which helped in establishing commitment and desirable attitude among pre-service teachers for an effective and competent teaching performance [28]. Significantly, the teacher education programs of the respondent TEIs are compliant to CHED policies and standards. In addition, the highest rating on the Social Regard for Learning of the pre-service teachers connotes that they are seen to be very competent in “acting as role models, through actions and statements, for the learners to appreciate the

importance of learning and exerting effort to learn” [29].

Table 5. Difference in the Epistemological Beliefs, Academic Performance, and Teaching Competence of Pre-Service Teachers When Grouped by Sex

Variables	Sex	N	Mean	t-value	p-value
Epistemological Beliefs	Male	44	179.39	-1.422	0.156
	Female	188	182.26		
Academic Performance	Male	44	86.9020	1.331	0.185
	Female	188	86.3462		
Teaching Competence	Male	44	248.02	-.620	0.536
	Female	188	251.44		

*Significant at $p < 0.05$

Table 5 discloses that there is no statistically significant difference in the epistemological beliefs, academic performance, and teaching competence of pre-service teachers when grouped by sex. In other words, responses to these variables do not significantly vary whether the pre-service teachers are males or females. The result of this study reveals that despite the dominance of females in teacher education, the epistemological beliefs, academic performance and teaching competence of pre-service teachers do not significantly vary for males and females. This concurs with the findings of previous studies of Tümkaya [30] and Ali [31] highlighting the lack of variations in these variables for both sexes.

Table 6. Difference in the Epistemological Beliefs, Academic Performance, and Teaching Competence of Pre-Service Teachers When Grouped by Program

Variables	Course	N	Mean	t-value	p-value
Epistemological Beliefs	BEEED	74	181.23	-0.418	0.676
	BSEED	158	181.94		
Academic Performance	BEEED	74	85.8169	-2.684	0.008**
	BSEED	158	86.7489		
Teaching Competence	BEEED	74	248.54	-0.713	0.477
	BSEED	158	251.85		

**Significant at the 0.01 level

As indicated in Table 6, there is a statistically significant difference in the academic performance of pre-service teachers when grouped by program. The BSEd pre-service teachers performed better academically than their BEEd counterparts. This can be attributed to the observation that students who enroll in the BSEd program are more academically prepared than those who are attracted to the BEEd program. According to Acedo [23], “students consider

BEEed an easier and cheaper option than BSEd, so students with lower preparation and motivation tend to be attracted to the BEEed program”. On one hand, Aquino and Balilla [32] attribute this to the general perception “that the courses in BSEd program are more difficult than those of the BEEed programs hence BSEd students might have put more effort in studying”. They further posit the reason that BEEed students find difficulty in mastering all the courses in the BEEed curriculum because it is a combination of many general education courses. Subsequently, their grades are affected.

As seen from Table 7 below, there is a statistically significant difference in the epistemological beliefs as well as academic performance of pre-service teachers when grouped by specialization. Further analysis using post hoc test bares that English group more

likely to believe in the factors of epistemological as compared to Generalist, Physical Science, Mathematics, and Technology Livelihood Education groups. For the academic performance, Mathematics majors had higher mean grade as compared to the Generalist and Technology and Livelihood Education groups.

This is parallel to the results of the studies of Arslantaş [33], Tummyaka[30]. Paulsen & Wells [34] conclude that “students’ beliefs about the nature of knowledge and learning are related to the disciplinary contexts in which students select and experience their specialized coursework”.

In line with this, Conole[35] and Hofer [36] assert that every discipline has its own belief system that may significantly influence learners’ perspective on how knowledge is acquired[22].

Table 7. Difference in the Epistemological Beliefs, Academic Performance, and Teaching Competence of Pre-Service Teachers When Grouped by Specialization

Variables	Specialization	N	Mean	F-value	p-value	Interpretation
Epistemological Beliefs	GENERALIST	57	180.75	4.021	0.000**	Significant
	PSED	17	182.82			
	BIOSCI	17	183.47			
	PHYSICI	10	171.00			
	ENGLISH	37	189.78			
	MATH	26	179.04			
	TLE	15	184.93			
	MAPEH	4	177.75			
	SOCSCI	33	177.27			
	FILIPINO	16	181.63			
Academic Performance	GENERALIST	57	85.7472	3.761	0.000**	Significant
	PSED	17	86.0506			
	BIOSCI	17	85.4041			
	PHYSICI	10	86.0590			
	ENGLISH	37	87.2589			
	MATH	26	87.6638			
	TLE	15	84.9920			
	MAPEH	4	84.4850			
	SOCSCI	33	87.3364			
	FILIPINO	16	86.9444			
Teaching Competencies	GENERALIST	57	245.53	1.397	0.191	Not Significant
	PSED	17	258.65			
	BIOSCI	17	252.82			
	PHYSICI	10	235.20			
	ENGLISH	37	263.32			
	MATH	26	244.42			
	TLE	15	254.40			
	MAPEH	4	244.00			
	SOCSCI	33	246.91			
	FILIPINO	16	256.50			

**Significant at the 0.01 level

Table 8. Difference in the Epistemological Beliefs, Academic Performance, and Teaching Competence of Pre-Service Teachers When Grouped by Ethnicity

Variables	Ethnicity	N	Mean	F-value	p-value	Interpretation
Epistemological Beliefs	Ilokano	123	181.67	1.080	0.372	Not significant
	Ibanag	10	177.40			
	Kalinga	4	171.75			
	Itawis	83	182.87			
	Malaueg	2	175.00			
	Tagalog	10	182.40			
Academic Performance	Ilokano	123	86.3998	0.265	0.932	Not Significant
	Ibanag	10	86.5390			
	Kalinga	4	86.2050			
	Itawis	83	86.5424			
	Malaueg	2	84.6600			
	Tagalog	10	86.7050			
Teaching Competence	Ilokano	123	247.75	0.783	0.563	Not Significant
	Ibanag	10	257.50			
	Kalinga	4	252.00			
	Itawis	83	252.55			
	Malaueg	2	251.50			
	Tagalog	10	266.30			

Aside from epistemological beliefs, there is also significant difference in academic performance of pre-service teachers when grouped by specialization. It was found out that the Mathematics group obtained the highest mean grade. One likely explanation is that BSEd pre-service teachers who specialized in Mathematics have established better study habits than their counterparts. Marpa's [37] study revealed that Mathematics major students have an average level of time management and good study habits that positively influence their academic achievement.

As observed from the data in Table 8 below, there is no statistically significant difference in the epistemological beliefs, academic performance, and teaching competence of pre-service teachers when grouped by ethnicity. This is consistent with the findings of Camargo [38] asserting that academic achievement of the learners does not suggest significant variation with regard to cultural orientation.

Table 9 unveils a significant negative relationship between epistemological beliefs and academic performance. The data connote that the less likely the pre-service teachers believe in the factors of epistemological beliefs, the higher are their grades. In other words, pre-service teachers who hold more mature epistemological beliefs have better academic performance.

Several studies of leading researchers such as Schommer [39], Schommer-Aikins and Easter [12], Garcia [11] and Arslantaş [33] displayed that

epistemological beliefs are significantly related to various aspects of academic performance. It is noted that "an individual's belief system has a bearing on how a person learns"[22].

Table 9. Relationship Between and Among Epistemological Beliefs, Academic Performance, and Teaching Competence of Pre-Service Teachers

Variables	Epistemological Beliefs	Academic Performance	Teaching Competence
Epistemological Belief	1	-.166*	.050
Academic Performance	-.166*	1	.043
Teaching Competence	.050	.043	1

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

The current study concurs with these aforementioned studies. This essentially confirms Schommer's theory that mature or sophisticated beliefs appear to facilitate positive learning strategies and foster students' independent reasoning abilities and thus significantly impact academic performance [17].

As disclosed in Table 10, Fixed Ability and Certain Knowledge can predict academic performance which account for 1.6% and 2.7% respectively on the total variance, while Simple Knowledge can predict teaching competence which accounts 1.9% of the total variance. The finding asserts that epistemological

beliefs factors, except for Quick Learning, can predict, at a minimum level, the academic performance and teaching competence of pre-service teachers.

Table 10. Factors of Epistemological Beliefs that Can Predict Better Academic Performance and Teaching Competence of the Pre-service Teachers

Epistemological Beliefs	Academic Performance			Teaching Competencies		
	R ²	Adjusted R ²	P-value	R ²	Adjusted R ²	P-value
Simple Knowledge	0.011	0.007	0.112	0.023	0.019	0.019
Fixed Ability	0.020	0.016	0.032	0.004	0.000	0.342
Quick Learning	0.002	-0.002	0.490	0.002	-0.003	0.528
Certain Knowledge	0.031	0.027	0.007	0.005	0.001	0.276

This implies that other factors or variables, aside from the beliefs on the nature of knowledge and learning, can notably account for the academic performance and teaching competence of the pre-service teachers.

Result of this present study discloses that epistemological beliefs predict, though at a minimum level, the academic performance and teaching competence of pre-service teachers. Various researches likewise support this finding. Additionally, using path analysis, it was suggested that both general and domain specific epistemological beliefs predicted academic performance as measured by overall grade point average [40]. Besides, Lodewyk [41] affirmed that epistemological beliefs, particularly the belief on simple knowledge, significantly predicted overall learners' performance.

CONCLUSION

The pre-service teachers hold mature epistemological beliefs, have satisfactory academic performance, and are competent in teaching; hence, they have the necessary mental construct, attributes and competencies required in the teaching profession. Specialization of pre-service teachers spells out differences in epistemological beliefs and academic performance. Moreover, differentials in their academic performance are also attributed to their program. Pre-service teachers who hold mature epistemological beliefs have better academic performance and these developed beliefs predict their teaching competence at minimum level.

The study, however, has some limitations. Foremost, the sample size is only limited to a state university and a private university in Tuguegarao City, Cagayan. To have a better generalizability of the findings, it is suggested to future researchers to undertake a parallel study with a regional or inter-regional scope. Secondly, to lay a more comprehensive picture of the interplay of the variables, it is also important to include the new program of teacher education in state universities which is the Bachelor of Technical Teacher Education (BTTE). In the study, the BTTE program was not included for consistency and parallelism purposes. It must be noted that private teacher education institutions in the locale of the study do not offer the said program.

On a practical note, these findings yield important implications to teacher education. Congruently, an understanding of pre-service teachers' epistemological beliefs vis-à-vis academic performance and teaching competence helps the teacher education institutions design effective teaching and learning framework. This is with the end view of increasing awareness and insights on how prospective teachers can become active participants in creating epistemologically conducive learning atmosphere.

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