

# Do Academic Achievement in Professional Education, Major and Field Study Courses Relate to Pre-service Teachers' Teaching Performance?

**Kira D. Gabuan**

Northern Negros State College of Science and Technology  
kirzmadgabuan@yahoo.com.ph

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**Abstract** - *Academic achievement may not predict teaching performance. This is the conclusion of a descriptive-correlational study which attempted to establish the relationship of achievement in professional education, major, and field study courses to pre-service physical science teachers' teaching performance. The pre-service physical science teachers of the College of Education of Northern Negros State College of Science and Technology were grouped as to sex, age and scholarship status. Grades sourced from the files of Registrar's Office were used to represent their academic achievement that revealed three major findings. The academic achievement of pre-service physical science teachers was "Very Good" in professional education courses, "Good" in major courses, and "Superior" in field study courses. Using the Pre-service Teacher's Actual Teaching Checklist during the in-campus, off-campus, and final teaching demonstration, the teaching performance of pre-service physical science teachers was found only "Very Satisfactory". The results imply that pre-service physical science teachers' grades in the identified courses are not determinants of success in their actual teaching practice in which they can maximize application of accumulated learning. It is safe to assume that preparation of pre-service physical science teachers is incongruent with the standards of the teaching profession. Therefore, the teacher training institution reserves the opportunity to upgrade pre-service preparation of physical science teachers.*

**Keywords:** *Academic achievement, Pre-service teachers, Teaching performance*

## INTRODUCTION

The primary concern of teacher training institutions is to provide high-quality teacher preparation experiences to pre-service teachers [1] who will embody the ideals and aspirations to develop learners as productive members of the society and effect change in the quality of life [2].

In most countries around the globe, teacher preparation in science was inadequate and there was an urgent need for better training of teachers at all levels [3]. This echoed University of the Philippines National Institute for Science and Mathematics Education Development (UP NISMED's) study which disclosed that teachers handling science subjects had inadequate preparation [4].

The claims impact teacher training institutions as they develop teachers who are expected to meet the challenges of teaching profession [5]. The success or failure of an institution is measured by the formation of the ideal graduate [6], whose performance, reflects the quality of pre-service training they experienced [7].

The experiences referred to in the concepts mentioned above are enacted to concretize the idea of the curriculum which consists of all planned experiences that the school offers [8]. Pre-service science teachers experience the curriculum which are naturally grouped into theoretical studies and practical activities [9]. The academic components are achieved in the classrooms while the latter translate learning through practice or student teaching [2].

In the context of a world economy, quality of life is anchored on a strong economic development [10]. A country's economic development is strongly correlated to its productivity in chemical and physical sciences [11]. In fact, science is a necessity for the world of work and economy [12]. Thus, efforts to improve science education must continue.

Three curricular components prescribed for pre-service physical science teachers: professional education, major, and field study courses are sequenced according to content and purpose. Each component augments the other to prepare the pre-service science teachers toward the actual teaching [13].

In the classrooms, the pre-service teachers learn physical science as a major subject. Physical science is consisting of chemistry, physics, astronomy, geology and meteorology [14]. Macugay and Bernardo [15] proposed that more intensive science coursework for science teachers has added benefits, and develop pedagogical beliefs related to teaching and learning practices known to be associated with better student learning.

Aside from specialization courses, pre-service physical science teachers should also complete the required professional education courses. These courses provide necessary concepts and theories, methods and strategies [13] unique to science teachers that promote quality learning outcomes [7].

Field study courses are experienced outside the classrooms to provide practical and actual learning experiences in real classroom settings. These require pre-service teachers to spend "observation classes" outside the classroom and reflect on the theories they learned [16].

The integration of theory and practice brings to light the assessment of teaching performance by way of instruction demonstration. Educators consider practice teaching as the most important single activity [11] that translate teaching and learning theories to practice [2].

To Sharbain and Tan [17], teaching ability is correlated with pre-service teachers training program. Teacher training was positively related to effective teaching and to student achievement [18].

High-quality teacher preparation is Singapore's best, elevating students' performance in international assessment [19]. As such, any attempt to improve the quality of primary education should consider the fundamental goal of improving the quality of pre-service teachers [20].

Assessment of performance of pre-service teachers is the best way to improve the quality of teacher preparation [21]. An evaluation instrument for assessing practice teaching of pre-service teachers is in the form of a checklist. Assessments indicate that pre-service teachers are ready to take the challenge in work environment.

This study attempted to establish the relationship of achievement in Professional Education, Major, and Field Study Courses to Pre-service Physical Science Teachers' Teaching Performance. The sources of data were limited to the BSEd IV - Physical Science students who underwent practice teaching in the School Year 2015-2016 at Northern Negros State College of Science and Technology (NONESCOST).

The pre-service physical science teachers were grouped according to the following variables: sex, age and scholarship status. Related studies showed that as learners, the achievement of pre-service teachers in curricular courses and their teaching performance vary because of some factors such as sex, age, family, and community background [22].

A study suggested that sex had no significant influence on the teaching performance of student-teachers [23]. In another study, sex had a significant correlation with student cumulative grade point average and a predictor of academic performance in science [24].

Age was found to significantly contribute to the academic performance of students [25].

The giving of scholarship to students showed some benefits for students, including boosting students' credit accumulation, grades and persistence [26].

The Pre-service Teacher's Actual Teaching Checklist was used to assess teaching performance. The level of achievement of pre-service physical science teachers was measured through their grades, in professional education, major, and field study courses as reflected in BSEd - Physical Science curriculum.

Studies along fulfilment in the teaching of pre-service science teachers remain very limited. Joint researches on assessing the performance of secondary science pre-service teachers deal with the areas of mastery of subject matter knowledge, evolving teaching self-efficacy and inquiry-based enacted practices [27].

Since the inception of the College of Education of NONESCOST, a study on the correlates of pre-service teachers' performance has not been explored. As such, the researcher believes that an inquiry into the performance of pre-service science teachers and its correlates become imperative.

## **OBJECTIVES OF THE STUDY**

This study aimed to ascertain if achievement in professional education, major and field study courses relates to pre-service physical science teachers' teaching performance. Specifically, it sought to identify the level of achievement of pre-service physical science teachers when taken as a whole and grouped according to sex, age, and scholarship status in professional education courses, major courses, and field study courses; determine the level of teaching performance of pre-service physical science teachers as a whole and when grouped according to variables; test the significant differences in the achievement of pre-

service physical science teachers in the aforementioned courses as to variables; and test the significant differences in the teaching performance of pre-service physical science teachers according to variables in the study.

## METHODS

### Research Design

A descriptive-correlational research design was used for this study to determine if the level of academic achievement of pre-service physical science teachers in professional education, major, and field study courses relate to teaching performance. This model describes and interprets the present condition and determines the relationship between two factors based on correlation coefficient [28].

This design was used by Mendezabal [30] and by Selçuk [31] to examine the relationship of variables in their studies.

### Participants

The thirty-eight pre-service physical science teachers, thirty-one (31) of whom are female and 7 (seven) are male, composed the subjects of the study, enrolled for Academic Year 2015-2016; twenty-eight (28) of the respondents are considered “younger” while ten (10) belong to the “older” age bracket; twenty-five (25) of the respondents are scholarship grantees while the rest (13) are non-grantees.

### Instrument

The level of achievement in professional, major, and field study courses of pre-service physical science teachers was measured through the grades of respondents in those courses from first year to fourth year as reflected in BSEd- Physical Science curriculum.

To determine the level of teaching performance of pre-service physical science teachers, the researcher utilized the standard Pre-service Teacher's Actual Teaching Checklist. This checklist evaluated the performance of pre-service teachers in micro-demonstration teaching (in-campus), weekly evaluation in ten (10) weeks, and final demonstration (off-campus).

The Pre-service Teacher's Actual Teaching Checklist was prescribed by the Teacher Education Council (TEC) of the Philippines, Department of Education (DepEd), and CHED to all teacher training institutions [13].

A modification was done to the said Checklist by the College of Education to measure objectively the

teaching performance of pre-service teachers based on a five-point scale patterned from Likert. This effort restricts the assessment of teaching performance to a five-point scale [11]. As a gathering instrument, the Pre-Service Teachers' Actual Teaching Checklist is considered reliable and valid.

### Procedure

Permission was sought from and granted by the Dean of the College of Education to have access to each of the respondent's portfolio that records evaluation of pre-service teaching performance.

A letter of request to the College's Registrar was made to obtain the copy of the individual record of the respondents' grades in all courses from first year to fourth year.

A copy of the list of scholars of the pre-service teachers in the BSEd- Physical Science degree program was obtained from the Office of the Student Affairs and Services.

The data were treated in accordance with the specific problems raised in the study.

### Data Analysis

Mean and standard deviation were used to determine the level of teaching performance and the level of achievement in professional, major, and field study courses of pre-service physical science teachers.

The *t*-test for independent means was used to find out the significant differences in the achievement of the pre-service teachers in professional education, major, and field study courses and the significant differences in the teaching performance of the pre-service teachers when grouped according to variables in the study.

The Pearson-Product Moment Correlation Coefficient (Pearson *r*) was used to determine if there is significant relationship between the level of achievement in the identified courses and the teaching performance of pre-service teachers.

The scale used to interpret the level of academic achievement in the identified courses in the study was adopted from the NONESCOST Student Handbook [31]: 1.00 – Excellent /Very Superior; 1.10 – 1.50 – Superior; 1.60 – 2.00 - Very Good/Above Average; 2.10 – 2.50 – Good/Average; 2.60 – 3.00 –Satisfactory /Fair.

The given scale was used to interpret the level of teaching performance of the research subjects: 1.00 – 1.50 – Excellent (E); 1.51 – 2.50 -Very Satisfactory

(VS); 2.51 – 3.50 – Satisfactory (S); 3.51 – 4.50 – Fair (F); 4.51 – 5.00 -Needs Improvement (NI).

**RESULTS AND DISCUSSION**

**Table 1. Level of Achievement of Pre-Service Physical Science Teachers**

		M	SD	Int
<b>Professional Education</b>				
Sex	Male	1.97	0.15	Very Good
	Female	1.91	0.14	Very Good
Age	Younger	1.91	0.14	Very Good
	Older	1.96	0.14	Very Good
Scholarship Status	Grantee	1.90	0.14	Very Good
	Non-Grantee	1.96	0.13	Very Good
As a Whole		1.92	0.14	Very Good
<b>Major Courses</b>				
Sex	Male	2.08	0.21	Good
	Female	2.06	0.15	Good
Age	Younger	2.05	0.17	Good
	Older	2.10	0.12	Good
Scholarship Status	Grantee	2.03	0.17	Good
	Non-Grantee	2.12	0.11	Good
As a Whole		2.06	0.16	Good
<b>Field Study Courses</b>				
Sex	Male	1.48	0.08	Superior
	Female	1.47	0.12	Superior
Age	Younger	1.47	0.13	Superior
	Older	1.48	0.08	Superior
Scholarship Status	Grantee	1.46	0.14	Superior
	Non-Grantee	1.50	0.06	Superior
As a Whole		1.47	0.12	Superior

Table 1 shows that the level of achievement of pre-service physical science teachers in professional education, major, and field study courses when taken is “Very Good” (M = 1.92, SD = 0.14); “Good” (M = 2.06, SD = 0.16); and “Superior” (M = 1.47, SD = 0.12), respectively.

Collectively, the results reveal that the respondents achieved better in professional and field study courses than in major courses. This may imply that the respondents have experienced difficulties in major courses and this hindered the very good or superior level. This means that both fruitful and unsuccessful students find science harder than some other subjects [5]. Science majors are gradually leaving the field because it is challenging and more complex, [32] and is taught with abstraction and mathematical emphasis [7].

In terms of sex, the level of achievement of the respondents in professional education courses is “Very Good”; “Good” in major courses; and “Superior” in

field study courses. It can be surmised that in the identified courses, females scored higher than males as evidenced by mean and standard deviation values, respectively.

This finding conforms to Goni, Ali, and Bularafa’s study which disclosed that female prospective teachers tended to outperform their male counterparts [33]. However, it contradicts the study of Aina [34] and Afuwape and Oludipe [35].

In terms of age, the achievement level of both groups is interpreted as “Very Good” in professional courses, “Good” in major courses and “Superior” in field study courses.

Overall, finding suggests that younger and older respondents are pacing in the same speed and manner in the attainment of passing grades. This implies that teachers design activities adaptable to both younger and older students. The study of Ebebuwa-okoh [36] revealed that younger and older undergraduate students obtained the same level of academic performance based on their cumulative grade point average.

Considering the variable, scholarship status, the level of achievement of grantees and non-grantees pre-service teachers in professional education is “Very Good”; “Good” in major courses and “Superior” in field study courses. The result shows that pre-service teacher grantees attained higher level of achievement than the non-grantees.

The finding implies that discounting the financial burden, grantees have more time to devote to their studies enabling them to achieve higher in academics than the non-grantees [37], [38]. Students with scholarships possess drive to excel and become achievers as a means of paying back the grant [39].

**Table 2. Level of Teaching Performance of Pre-Service Physical Science Teachers**

Variable	Grouping	Teaching Performance		
		M	SD	Int
Sex	Male	1.69	0.27	VS
	Female	1.71	0.19	VS
Age	Younger	1.67	0.20	VS
	Older	1.82	0.17	VS
Scholarship Status	Grantee	1.72	0.21	VS
	Non-Grantee	1.69	0.19	VS
As a Whole		1.71	0.20	VS

Table 2 indicates that when classified to sex, the level of teaching performance of respondents is “VS”, showing the following values (M = 1.69, SD = 0.27; M = 1.71, SD = 0.19) respectively.

As to age, the level of teaching performance of both age groups is “VS” as reflected in the following values

(M = 1.67, SD = 0.20; M = 1.82, SD = 0.19) respectively.

Regarding scholarship status, the level of teaching performance of pre-service teacher grantees and non-grantees is “VS” as indicated by these values (M = 1.72, SD = 0.21; M = 1.69, SD = 0.182) respectively.

In entirety, the level of teaching performance of pre-service teachers is “Very Satisfactory” (M = 1.71, SD = 0.20). The finding reveals that pre-service teachers equally performed well in teaching physical science. The result implies that when pre-service teachers are exposed to varied instructional experiences relative to practice teaching, they produce the same expected output. This corroborates with the studies of Conejar [40] and Pagaduan [20] suggesting that teaching and learning process is conducted fairly and sensitized to the pre-service teachers' skills and needs [41].

**Table 3. Differences in Pre-Service Physical Science Teachers Achievement in Identified Courses as to Sex**

Course Achievement	Category	M	SD	p – value
Professional Education	Male	1.97	0.15	0.32
	Female	1.91	0.14	
Major Courses	Male	2.08	0.21	0.29
	Female	2.06	0.15	
Field Study	Male	1.48	0.08	0.17
	Female	1.47	0.12	

\*Significant at  $p > 0.05$

The  $p$  - values (0.32; 0.29; 0.17) on Table 3 indicate a no significant difference among the achievement of pre-service teachers in the identified courses, respectively, in both sexes. This could mean that teachers attend closely to both sexes equally. The results concur with the findings of Ejimaji and Emejene [42], Abubakar and Oguguo [24], and Afuwape and Oludipe [35].

The  $p$ -values (0.86; 0.27; 0.07) on Table 4. reveal that the achievement in respective identified courses is not significantly different when respondents were grouped according to age. The result suggests that both older and younger pre-service teachers have the same desire with dedication to reach the same goal- to pass the course. The finding corresponds with the results of investigations that age was insignificant as it is related to the grade point average of pre-service science teachers [24], [42]. However, in another study, it was found to be significant [25].

**Table 4. Differences in Pre-Service Physical Science Teachers Achievement in Identified Courses as to Age**

Course Achievement	Category	M	SD	p - value
Professional Education	Younger	1.91	0.14	0.86
	Older	1.96	0.14	
Major Courses	Younger	2.05	0.17	0.27
	Older	2.10	0.12	
Field Study	Younger	1.47	0.13	0.07
	Older	1.48	0.08	

\*Significant at  $p > 0.05$

**Table 5. Differences in Pre-Service Physical Science Teachers Achievement in Identified Courses as to Scholarship Status**

Course Achievement	Category	M	SD	p – value
Professional Education	Grantee	1.90	0.14	0.89
	Non- Grantee	1.96	0.13	
Major Courses	Grantee	2.03	0.17	0.71
	Non- Grantee	2.12	0.11	
Field Study	Grantee	1.46	0.14	0.23
	Non- Grantee	1.50	0.06	

\*Significant at  $p > 0.05$

Table 5 reflects no significant difference in the achievement of pre-service teachers in professional education, major, and field study courses as reflected in these  $p$ - values (0.89; 0.71; 0.23) respectively. This could mean that both grantees and non-grantees possess the same drive to pass the courses and graduate at the same designated time. This contradicts the preposition of Patel, Richburg-Hayes, de la Campa, and Rudd [26] and Ganem and Manasse [43] that scholarship is the major predictor of student persistence, progression, and timely graduation.

**Table 6. Differences in the Teaching Performance of Pre-Service Physical Science Teachers as to Sex**

Teaching Performance	M	SD	p- value
Male	1.69	0.27	0.39
Female	1.71	0.19	

\*Significant at  $p > 0.05$

The result on Table 6. discloses that there is no significant difference ( $p = 0.39$ ) in the teaching performance between male and female pre-service teachers. The result of the study affirms the claim that gender had no significant influence on teaching performance of student-teachers [23].

**Table 7. Differences in the Teaching Performance of Pre-Service Physical Science Teachers as to Age**

Teaching Performance	M	SD	p- value
Younger	1.67	0.2	0.02
Older	1.82	0.17	

\*Significant at  $p > 0.05$

Table 7 indicates that the  $p$ -value is 0.02 which means that the teaching performance between younger and older respondents differ significantly. The result suggests that older pre-service teachers are more focused and can work independently than their younger counterparts. This negates the result of the study of Ada, Achor and Duguryil [44].

**Table 8. Differences in the Teaching Performance of Pre-Service Physical Science Teachers as to Scholarship Status**

Teaching Performance	M	SD	p- value
Grantee	1.72	0.21	0.36
Non-Grantee	1.69	0.19	

\*Significant at  $p > 0.05$

The  $p$ - value of 0.36 in Table 8. reveals that there is no significant difference in the teaching performance between pre-service teacher grantees and non-grantees. This may seem contrary to the proposition of Patel, Richburg-Hayes, de la Campa, and Rudd [26].

**Table 9. Relationship of Pre-Service Physical Science Teachers' Achievement to Teaching Performance**

		P Edu	Major	FS	TP
P Edu	Pearson Correlation	1	0.80**	0.58**	0.32
	Sig. (1-tailed)		0.00	0.00	0.05
	N	38	38	38	38
Major	Pearson Correlation	0.80**	1	0.64**	0.32
	Sig. (1-tailed)	0.00		0.00	0.05
	N	38	38	38	38
FS	Pearson Correlation	0.58**	0.64**	1	0.31
	Sig. (1-tailed)	0.00	0.00		0.06
	N	38	38	38	38
TP	Pearson Correlation	0.32	0.32	0.31	1
	Sig. (1-tailed)	0.05	0.05	0.06	
	N	38	38	38	38

\*\* Correlation is Significant at the 0.01 (1-tailed)

**Legend:** P Edu- Professional Education, FS- Field Study, TP – Teaching Performance

Table 9 has revealed no positive relationship between the achievement of pre-service physical science teachers in professional education, major, and field study courses to teaching performance. The result concurred with Agostino and Powers [45] that the grade point average of pre-service teachers may not be a better predictor of teaching performance. However, it negates with the results of the studies of Pagaduan's [20] and Hall and West [46].

## CONCLUSION AND RECOMMENDATION

Pre-service physical science teachers academically achieved higher in professional education courses, and field study courses than in major courses. It does not follow then that when pre-service teachers perform well in professional and field study courses, they will do the same in major courses. Teacher training institutions must strengthen the preparations of pre-service teachers in major courses. Remedial classes may be programmed to provide the knowledge and skills missed. Higher standards as in cut-off grades in major courses may be set for selection and retention purposes for those pre-service teachers who want to specialize in physical science.

Male pre-service physical science teachers perform better than their female counterparts in major courses. This study confirms that sex matters as far as achievement in physical science is concerned. Teacher training institutions should promote gender equality among the pre-service teachers. Stereotyping must be discouraged among the faculty members to provide equal learning opportunities to both sexes.

Pre-service physical science teacher scholarship grantees and non-grantees have the same level of achievement in professional education, and field study courses. On the other hand, pre-service physical science teacher grantees perform better in major courses. This shows that academic achievement may be influenced by being a scholar. Scholarship sponsors and patrons must continue their support to poor and deserving students. In addition, a scholarship scheme may be designed, one that will include requirements such as interest and grade in the chosen specialization.

The teaching performance of pre-service physical science teachers can be upgraded by providing adequate training to teacher-trainees before they are sent out for practice teaching. Since sex, age, and scholarship status are not indicators of teaching performance, other factors like orientations and workshops may be investigated as they may be predictors.

Age affects teaching performance. Faculty of teacher training institutions may craft different activities that fits varied ages of pre-service teachers. Modelling ideal during the in-campus practice teaching demonstration by senior pre-service teachers may be considered.

The level of achievement in professional education, major, and field study courses may not be a better predictor of teaching performance of pre-service teachers. Further investigation must be carried out to ascertain the disparity found on the ratings of pre-service teachers on field study courses against teaching performance as this have led to non-congruence between the two measures. Teacher training institutions and future researchers may investigate other factors that may affect and relate to teaching performance.

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