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Investigating Mathematics Achievement Goals among Preservice Teachers: Inputs to Curricular Enhancement

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Abstract: Learning Mathematics at the tertiary level is essential among Math and non – Math preservice teachers. This provides the foundational knowledge and mental discipline to teach Math and other school subjects such as Science, Arts, Music, Social Sciences, and technical subjects. Various studies have shown that motivational constructs such as Mathematics achievement goals can influence students' achievement outcomes while learning Mathematics. Thus, this study investigated the Mathematics achievement goals among the preservice teachers. There were twelve research questions and two hypotheses that guided the study. This utilized descriptive survey design and data were collected online thru Google Forms. A sample of 147 preservice teachers from a selected university in Zamboanga City was randomly selected through proportionate and systematic sampling procedures. This study adapted the Mathematics Achievement Goals Orientation questionnaire by Mohd Rustam Mohd Rameli and Kosnin Azlina. The research instructor and subject matter experts validated this, and the subscales attained acceptable reliability coefficients during the pilot testing based on the computed Cronbach's alpha. Mean, standard deviation and Pearson – r correlation were utilized in the analysis of the data. Findings revealed that preservice adopt mastery goals more than performance goals. Results also showed that achievement goals between Math and non – Math preservice teachers are not significantly different. This study recommends that math teachers in higher education may create a learning environment that can foster mastery and performance-approach goals in Mathematics among preservice teachers.
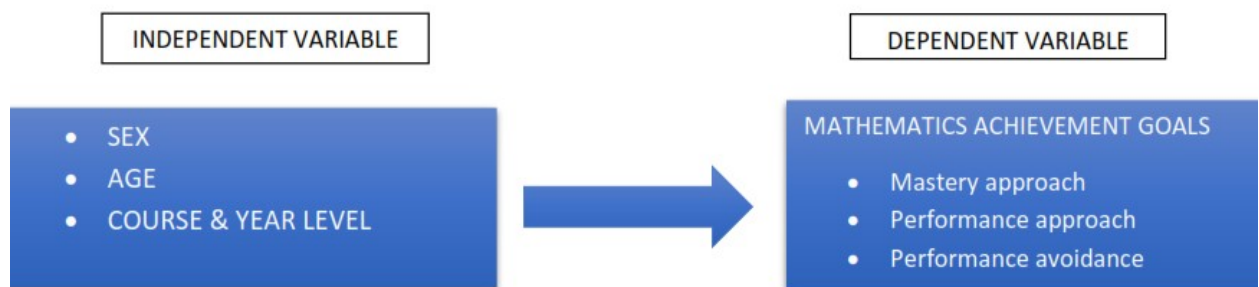
Keywords: Achievement Goals, Mathematics and Preservice Teachers

1.1 Introduction

Education is the vital tool to achieve ones nor everyone's goals in life. Achieving the goals may help them be more competitive and conscious in the global market. Students, parents, and educators around the globe are feeling the grave effect of the COVID – 19 as schools are shutting down to prevent the higher risk of the safety of everyone. While government and health officials are doing their best to prevent this pandemics outbreak, global education systems are collaborating to collectively respond and provide quality education for every learner in these difficult times. As a result, education has changed dramatically, shifting to e-learning, whereby teaching is undertaken on digital platforms. Mathematics is very common, mainly among students, for most of the things of this world cannot be understood without its involvement. Students often to see mathematics as a difficult, burdensome, messy, complicated, and complex subject. Because of its difficulty, students used to exert more effort to understand it. Mathematics education specialists have been trying to explain the poor performance of students in mathematics.

Students dealing with mathematics subjects have numerous views or perspectives on achieving mathematics goals. Hence performance outcomes indicate that many students encounter learning difficulties in their academic lives prompting educational psychologist and guidance counselors to turn their attention in trying to understand key processes through which learners may Self Regulate (SR) their academic task and experience improved performance outcomes (Furner and Gonzalez-De Hass,2011). Higher mastery targets are ideally supposed to lead to greater academic achievement, and empirical evidence has been identified for mathematics students (Peklaj, Podlesek, & Peejak,2015). Academic achievement refers to the degree to which an individual has met particular objectives that were the focus of activities in the educational setting, such as school, college, or university. The purpose of this study is to assess the mathematics achievement goals among College of Teacher Education students or what we call the pre-service teacher of ZPPSU. Achievement goals stand for a comprehensive semantic system of situations or context which have cognitive, emotional, and behavioral outcomes and learners use them to interpret their performances (Dweck & Legget, 1998; Kaplan & Maehr,1999). The idea of achievement goals actually serves as a guide or reason for the students to do them tasks. In the context of mathematics learning, the achievement goals and learning habits of the students are important to be identified by the teachers since students perceived mathematics as a very difficult subject. Moreover, the assessment pressure that the students experience is also significant to determine their adaptation and specific achievement goals orientation in learning mathematics.

Theoretical/Conceptual Framework

65

Statement of the Problem

The study aims to determine the assessing mathematics achievement goals among Teacher Education Student of Zamboanga Peninsula polytechnic State University during the Second semester of the school Year 2020-2021. Specifically, this study seeks to answer the following questions:

What is the profile of the preservice teachers of the College of Teacher Education of Zamboanga Peninsula Polytechnic State University in terms of:

- Sex
- Course & Year level
- Age

Is there a significant relationship between the mastery, performance approach and performance avoidance of the preservice teacher?

Is there a significant difference in assessing mathematics achievement goals among Teacher Education Student when group according to:

- Sex
- Course & Year Level
- Age

1.2 Significance of the Study

The findings of this study will be beneficial to:

Dean. This research study will serve as guide and basis of the CTE Dean to determine how does students of CTE department of ZPPSU set their mathematics achievement goals.

Guidance Counselor. This research study will provide the information that can help to take action for the existing of student's failure in mathematics.

Teachers. This research study will help the teachers to guide and to manage students who's struggling in learning mathematics.

Students. This research study will help students to normalize the concept of having mathematics achievement goals and to minimize the failure in academic in relation to mathematics. This will also allow them to assess the importance of having mathematics achievement goals in academic system to reach their desired outcomes especially in their future career as educators.

Parents. Who are specifically concerned with their children's education in terms of school success in various disciplines.

1.3 Scope of Limitation

This study will be conducted to a specific number of Zamboanga Polytechnic State University students, specifically in College of Teacher Education, most especially to those students who doesn't really normalized the concept of having mathematics achievement goals and struggling in learning mathematics. This study focuses only to the

mathematics achievement goals and its effect to the mathematics learning and academic achievement of College of Teacher Education students of Zamboanga Peninsula Polytechnic State University. This study knowledge and conclusions were derived exclusively from this group of students. Lastly, this study focuses on assessing the mathematics achievement goals of students and to provide possible solutions to avoid or exterminate the failure of students in mathematics achievement.

2.1 Review Related Literature

This section primarily presents the different researcher, which have significant bearing on the variables included in the research. It focuses on several aspects that will help to the development of this study. The study is assessing mathematics achievement goals among teacher education student. The literature of this study comes from books, journals, articles, electronic materials such as PDF or E-Book and other existing thesis and dissertations, foreign and local that believed to be useful in the advancement of awareness concerning the study. Achievement goals are defined by Hulleman et al. (2010) as "a future-focused cognitive representation that guides behavior to a competence-related end state that the individual is either committed to approach or avoid" (p. 423). Achievement goal theories (Dweck, 1986; Elliot, 1999; Nicholls, 1984, 1989) are based on the notion that variations in the way in which individuals judge their own ability (i.e., perceptions of competence) and define successful accomplishments are critical antecedents for understanding young athletes' motivational processes (Duda, 2001). Achievement goals are thought to influence the direction of achievement behaviours such as behavioural engagement (Elliot, 2005; Elliot & Hulleman, 2017). Specifically, approach-orientated goals energise behavioural engagement that would ultimately manifest in improved achievement (Elliot & Church, 1997; Rawsthorne & Elliot, 1999). Mastery-approach goals have been linked to a variety of positive academic outcomes including interest, positive achievement emotions and achievement (e.g., Huang, 2011, Huang, 2012; Hulleman, Schrager, Bodman, & Harackewicz, 2010). In the goal standards approach, achievement goals are differentiated relative to the standard or criterion used to judge competence (Elliot, 2005; Senko & Tropiano, 2017). These can be relative to others (e.g., correctly solving more mathematics problems than the class average or a particular classmate), relative to the absolute demands of a task (e.g., solving a mathematics problem correctly), or relative to one's own past achievements or future potential (e.g., beating one's previous number of mathematics problems solved correctly). In terms of valence, approach goals occur when a student is striving for success, whilst avoidance goals occur when a student is striving to avoid failure (Elliot & Church, 1997). Successful mathematics learning at school is linked to future earning potential of an individual (Rose & Betts, 2004) and a globally competitive science, technology, engineering, and mathematics, workforce (Bates & Phelan, 2002). Accordingly, mathematics learning in primary and secondary education has been the focus of international research efforts (e.g., Kärkkäinen & Vincent-Lancrin, 2013; Wai, Lubinski, Benbow, & Steiger, 2010). However research has yet to examine how mathematics achievement in primary school children relates to achievement goals and behavioural engagement. To address this gap in the literature we focused on mathematics in the present study. In contrast with both E-V and attribution approaches, achievement goal theory focuses on the kind of motivation that operates in achievement settings. The emphasis on the role of cognitions is similar, however. Achievement goal theory focuses on students' constructions of the meaning of success, and thus of the goals they strive to achieve. In a direct critique of McClelland and Atkinson, who in his view defined need achievement mainly as a drive to succeed more than others, Nicholls (1989) proposed that there is more than one way of defining success. Initially, theorists distinguished between ego or performance goals that orient students to demonstrate competence by showing superior or masking inferior ability versus task or learning goals that orient students to define success as learning, and to strive to develop competence by acquiring worthwhile skills and understandings (Dweck, 1986;

67

Nicholls, 1989).

3.1 Methodology
Research Design
Research Survey Design are procedure in quantitative research in which investigator administer a survey to a sample of people to describe the mastery, performance approach and performance avoidance on assessing mathematics goals and achievement among preservice teacher. In this procedure, survey researchers collect quantitative numbered data using questionnaires (e.g. Google Form) and statistically analyzed the data to explain pattern in response to question and evaluate study questions or hypothesis. The descriptive-correlational approach was used in this analysis. It's also known as relationship studies, and it's used to figure out whether there's a connection between achievement goals and math success. When two variables are found to have a relationship, it means that scores within a certain range on one variable are correlated with scores within a certain range on the other variable. When a relationship between two variables is discovered, it ensures that scores in one variable's range are linked to scores in the other variable's range. This type of research will aid in the formulation of more informed recommendations. These studies are designed to look at the current situation rather than analyzing change and the factors that cause change.

Study Participants

Course in CTE	First Year	Second Year	Third Year	Fourth Year	Total
Beed	75	88	60	42	265
BSED-MATH	41	41	34	0	116
BPED/ BSED-MAPEH	46	82	89	37	254
BTVTED/BTTE	125	86	79	5	295
BTLED/ BSED-TLE	66	58	50	32	206
Total	353	355	312	116	1136

The participants for this study will be the 1st year to the 4th year pre-service teachers of Zamboanga Peninsula Polytechnic State University within the College of Teacher Education.
Sampling Procedure

Stratified Sampling/Systematic Sampling

Course in CTE	N	%	N
Beed	265	23.33	47
BSED-MATH	116	10.21	20
BPED/ BSED-MAPEH	254	22.36	45
BTVTED/BTTE	295	25.97	52
BTLED/ BSED-TLE	206	18.13	36
Total	1136	100	200

Research Instruments
The researchers developed the survey questionnaires based on an extensive literature review that has been done that meets the purpose of the study. The instrument used by the researchers is the AGQ (Achievement goals Questionnaire) to measure students' achievement goal orientation (Elliot dan Church, 1997). A questionnaire containing 12 items of three different achievement target orientation: mastery, performance-approach and

68

performance-avoidance were formed. Mastery consists of 4 questions, a performance approach consists of 5 questions, and performance avoidance consists of 3 questions, a total of 12 items.

Procedure
The researcher first constructed the research online, research questionnaire and identified research respondents through random sampling. Then researcher make sure to secure the permission by dean of College teacher Education in Zamboanga Peninsula Polythetic State University in order to administer the research instruments to the pre-service teachers. The researcher then gave the questionnaires to the respondents through the use google form and clarifies the significance of the study and provides a reward in exchange for their active involvement in the study by answering a questionnaire. Within our teacher or students, the participants will receive an invitation with a connection from the researcher. The researcher checked whether no questions left unanswered. Then the researchers immediately encoded the data for the treatments needed. After gathering of data, the researchers then treat and analyze the gathered data to identify the possible conclusion.

4.1 Results and Discussion
Our study result came from a respondent in Zamboanga Peninsula Polytechnic State College using a cross-sectional survey due to the pandemic situation. We deliver the survey form through the use of online with the platform of google form application. Stratified sampling is our basis for handling the respondent within the College of Teacher education in Zamboanga Peninsula Polytechnic State College.

Research Problem 1: What is the profile of the respondents in terms of Sex, Age, Course and Year Level?

Table 1.1 Frequency Distribution of Respondents in terms of Sex and Age

Variable	F	%
Sex		
Male	45	30.6
Female	102	69.4
Total	147	100
Age		
18 – 22	115	78.2
23 – 27	25	17.0
28 – 32	4	2.7
33 – 37	3	2.0

Our overall participants are over 147 students within the College of teacher education while finding a respondent using stratified sampling. Most are respondents came from the female, with 102 respondents and 45 for male. and while in the age group our respondent mostly came from an 18 to 22-year-old category with a 115 out of it while the least came from the sort of 33-37 years old with three respondents the distribution of year level our respondent mostly came from the second year with a 61 while the least is the fourth year with 10 frequencies.

Table 1.2 Frequency Distribution of Respondents in terms of Year Level

Year Level	F	%
First	35	23.8
Second	61	41.5
Third	41	27.9
Fourth	10	6.8

Table 1.3 Frequency Distribution of Respondents in terms of Course

Course	F	%
BEED	34	23.13
BSED-MATH	19	12.93
BPED	31	21.08
BTVTED	46	31.3
BTLED	17	11.56

The distribution of the course level is the BTVTED has the most respondent with 46 respondents while the least is in the BTLED has 17 respondents

Research Problem 2: Is there a significant relationship between the mastery, performance approach and performance avoidance of the preservice teacher?

Performance Approach and Mastery

Pearson - r Coefficient	Coefficient of Determination	Interpretation
0.349 ^{s}	0.698	Low Positive Correlation

Legend: ^{s} Significant at alpha = .05 level.

With a correlation value of .349, the table above shows that there is a modest significant positive link between mathematics Performance approach and Mastery of pre-service teachers in the control group. It also shows that the Mastery of college students accounts for 69.8% of the variance in the mathematics Performance Approach, while the remaining 30.2 percent of the variance in mathematics performance approach is related to other factors or sample error. This suggests that the mathematics performance strategy has a minor impact on pre-service teachers' grasp of the subject. Therefore, there is no significant relationship between Performance Approach and Mastery. Students who are mastery oriented are thought to process information using more complex and effective strategies, while performance orientated individuals are believed to apply less sophisticated learning approaches (Meece, Blumenfeld, Hoyle, 1988).

Performance Approach and Performance Avoidance

Pearson - r Coefficient	Coefficient of Determination	Interpretation
0.445 ^{s}	0.890	Low Positive Correlation

Legend: ^{s} Significant at alpha = .05 level.

70

The table above indicates that there is a low significant positive correlation between Performance approach and Performance Avoidance of the college students in the control group, with a correlation coefficient of .445. It also indicates that 89% of the variance in the mathematics Performance approach is attributed to the Performance Avoidance of the college students; leaving 11% of the variance in the mathematics Performance approach is attributed to other factors or due to sampling error. This implies that mathematics Performance approach has a small effect on the Performance Avoidance of the pre-service teachers. Therefore, there is no significant relationship between Performance Approach and Performance Avoidance. Performance avoidance is another predictor found in this study where it influences on academic achievement. Students with performance avoidance will try to obtain good social judgments in order to avoid punishment (Zare, H., Rastegar, A., & Davood Hosseini, 2011).

Mastery and Performance Avoidance

Pearson - r Coefficient	Coefficient of Determination	Interpretation
0.421 ^{s}	0.842	Low Positive Correlation

Legend: ^{s} *Significant at alpha = .05 level.*

The table above indicates that there is a low significant positive correlation between Mastery and Performance Avoidance of the college students in the control group, with a correlation coefficient of .421. It also indicates that 84.2% of the variance in the mathematics Mastery is attributed to the Performance Avoidance of the college students; leaving 15.8% of the variance in the Mastery is attributed to other factors or due to sampling error. Learning strategies applied by mastery orientated individuals are more sophisticated than those applied by performance orientated individuals (Seifert, 1995; Pintich & Garcia, 1991; Pintrich & De Groot, 1990; Pokay and Blumenfeld, 1990; Roney, Higgins, & Shah, 1995).This implies that mathematics Mastery has a small effect on the Performance Avoidance of the pre-service teachers. Therefore, there is no significant relationship between Mastery and Performance Avoidance. Research Problem 3: Is there a significant difference in assessing mathematics achievement goals among Teacher Education Student when group according to:

Sex

Table No.3.1 Independent t-test Result of mastery in terms of Sex

Sex	Mean	SD	Mean Difference	t – value (df =69)	p value	Decision on H_o
Female	4.25	0.47	0.23	2.27	.027	Rejected
Male	4.03	0.59				

Note: ^{ns} p value is greater than alpha = .05.

According to the table the null hypothesis, "There is a substantial difference in the terms of mastery of the respondents when data are grouped according to sex," is rejected. This demonstrates that when respondents are divided into groups based on sex, their mastery approaches differ significantly.

Table No.3.2 Independent t-test Result of performance approach in terms of Sex

Sex	Mean	SD	Mean Difference	t – value (df = 65)	p value	Decision on H_o
Female	3.52	0.64	0.04	1.99	0.76	Ho is not rejected
Male	3.46	0.78				

Note: [ns] p value is greater than alpha = .05.

In terms of Sex, the table reveals that the null hypothesis which states, "There is no significant difference in the term of performance approach of the respondents when data are group according to sex", is not rejected. This indicates that the performance approach of the respondents does not significantly differ when they are grouped according sex.

Table No.3.3 Independent t-test Result of performance avoidance in terms of Sex

Sex	Mean	SD	Mean Difference	t – value (df = 78)	p value	Decision on H_o
Female	3.84	0.61	0.07	1.99	.48	Ho is Rejected
Male	3.78	0.66				

Note: [ns] p value is greater than alpha = .05.

According to the table the null hypothesis, "There is a substantial difference in the terms of performance avoidance of the respondents when data are grouped according to sex," is rejected. This demonstrates that when respondents are divided into groups based on sex, their performance avoidance differ significantly.

A t-test is an inferential statistic used to determine if there is a significant difference in the means of two groups that are comparable in some aspects. (2020 Hayes)

Course

Table No.3.4 ANOVA Result of the of Mastery approach in terms of Course

Source of Variation	Sum of Squares	Df	Mean Square	F value	p value	Interpretation
Between Groups	2.68	4	0.67	2.84	0.03	Ho is Rejected
Within Groups	31.87	135	0.24			
Total	34.55	139	0.24			

In terms of course, there is a significant difference in the mastery approach categorized according to course. This indicates that the mastery approach of the college students is different across course. Post Hoc Tukey's tests below reveals that the course of BSED MATH tends to demonstrate mastery approach compare to the other courses, while the other courses tend to have the same level of mastery approach. All the other pairwise comparisons are not

72

significantly different.

Table No.3.4 Post Hoc Test on the Mastery approach in terms of Course

Courses	n	Level of mastery approach
BSED-MATH	19	4.5 $_a$
BEED	34	4.2$_b$
BTLED	10	4.2$_b$
BTVTED	46	4.1 $_b$
BPED	31	4.1$_b$

Legend: ^{a,b} Means are not significantly different at alpha .05, based on Tukey's Test. Means of C and A are significantly different.

Table No.3.5 ANOVA Result of the of performance approach in terms of Course

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	1.14	4	0.29	0.61	0.67	Ho is not rejected
Within Groups	66.90	142	0.48			
Total	68.03	146	0.47			

Note: Significant at alpha = .05; Null hypothesis is rejected.

In terms of Course, the table reveals that the null hypothesis which states, "There is no significant difference in the term of performance approach of the respondents when data are group according to course", is not rejected. This indicates that the Performance approach of the respondents does not significantly differ when they are grouped according course.

Table No.3.6 ANOVA Result of the of performance Avoidance in terms of Course
ANOVA Result of the *of performance Avoidance in terms of Course*

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	2.68	4	0.68	1.80	0.13	Ho is not rejected
Within Groups	52.72	142	0.38			
Total	55.38	146	0.38			

Note: Significant at alpha = .05; Null hypothesis is rejected.

In terms of Course, the table reveals that the null hypothesis which states, "There is no significant difference in the term of performance avoidance of the respondents when data are group according to course", is not rejected. This

73

indicates that the Performance avoidance of the respondents does not significantly differ when they are grouped according course.

Year Level

Table No.3.7 ANOVA Result of the of mastery approach in terms of Year Level

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	2.71	3	0.91	3.67	0.02	Ho is Rejected
Within Groups	35.12	143	0.25			
Total	37.82	146	0.26			

Note: Significant at alpha = .05; Null hypothesis is NOT rejected.

In terms of year level, there is a significant difference in the mastery approach categorized according to year level. This indicates that the mastery approach of the college students is different across year level. Post Hoc Tukey's tests below reveals that first-year college students have better mastery approach, with a mean of 4.26 as compare to the third-year college students. All the other pairwise comparisons are not significantly different

Table No.3.7 Post Hoc Test on the mastery approach in terms of Year Level

Year Level	n	Level of mastery approach
First Year	35	4.26a
Second Year	61	4.25 a
Third Year	41	3.97a
Fourth Year	10	4.38 a

Legend: [a,b] Means are not significantly different at alpha .05, based on Tukey's Test.

Table No.3.8 ANOVA Result of the of performance approach in terms of Year Level

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	3.85	3	1.29	2.86	0.04	Ho is Rejected
Within Groups	64.19	143	0.45			
Total	68.03	146	0.47			

Note: Significant at alpha = .05; Null hypothesis is rejected.

74

In terms of year level, there is a significant difference in the performance approach categorized according to year level. This indicates that the performance approach of the college students is different across year level. Post Hoc Tukey's tests below reveal that second year college students have better performance approach, with a mean of 3.6 as compare to the fourth-year college students. All the other pairwise comparisons are not significantly different.

Table No.3.8 Post Hoc Test on the performance approach in terms of Year Level

Year Level	n	Level of performance approach
First Year	35	3.6_a
Second Year	61	3.63_a
Third Year	41	3.32_a
Fourth Year	10	3.16_a

Legend: [a,b] Means are not significantly different at alpha .05, based on Tukey's Test. Means of C and A are significantly different.

Table No. 3.9 ANOVA Result of the of performance Avoidance Strategy in terms of Year Level

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	2.85263	3	0.950877	0.379347	0.05534	Ho is Rejected
Within Groups	52.5321	143	0.367357			
Total	55.38473	146	0.379347			

Note: Significant at alpha = .05; Null hypothesis is rejected.

In terms of year level, there is a significant difference in the performance Avoidance categorized according to year level. This indicates that the performance Avoidance of the college students is different across year level. Post Hoc Tukey's tests below reveals that first-year college students have better performance Avoidance, with a mean of 4.0 as compare to the fourth-year college students. All the other pairwise comparisons are not significantly different.

Table No 3.9 Post Hoc Test on the performance Avoidance in terms of Year Level

Year Level	n	Level of performance approach
First Year	35	4.0_a
Second Year	61	3.9_a
Third Year	41	3.7_a
Fourth Year	10	3.5_a

Age

Table No.3.10 ANOVA Result of the of Mastery approach in terms of Age

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	0.39	3	0.13	0.49	0.69	Ho is not rejected
Within Groups	37.44	143	0.26			
Total	37.82	146	0.26			

Note: Significant at alpha = .05; Null hypothesis is rejected.

In terms of Age, the table reveals that the null hypothesis which states, "There is no significant difference in the term of mastery approach of the respondents when data are group according to Age", is not rejected. This indicates that the mastery approach of the respondents does not significantly differ when they are grouped according course.

Table No.3.11 ANOVA Result of the of performance approach in terms of Age

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	1.56	3	0.52	1.12	0.34	Ho is not rejected
Within Groups	66.48	143	0.47			
Total	68.03	146	0.47			

Note: Significant at alpha = .05; Null hypothesis is rejected.

In terms of Age, the table reveals that the null hypothesis which states, "There is no significant difference in the term of performance approach of the respondents when data are group according to Age", is not rejected. This indicates that the performance approach of the respondents does not significantly differ when they are grouped according course.

Table No.3.12 ANOVA Result of the of performance avoidance in terms of Age

Source of Variation	Sum of Squares	df	Mean Square	F value	p value	Interpretation
Between Groups	0.65	3	0.23	0.57	0.64	Ho is not rejected
Within Groups	54.73	143	0.38			
Total	55.38	146	0.38			

Note: Significant at alpha = .05; Null hypothesis is rejected.

In terms of Age, the table reveals that the null hypothesis which states, "There is no significant difference in the term of performance avoidance of the respondents when data are group according to Age", is not rejected. This indicates that the performance avoidance of the respondents does not significantly differ when they are grouped according course. Statistical analysis is a numerical method for calculating probabilities between data sets or data results. It is possible to use data from either the natural or social sciences. Statistical analysis aids in the explanation of trends or patterns discovered throughout a topic's research. (Fitzpatrick, 2019). Use an ANOVA test or another evaluative means test. An ANOVA test, also known as an analysis of variance test, ensures that averages exist within each variable test group. If this is the case, the statistical analyses' sample sizes may be wrong. (Fitzpatrick, 2019).

5.1 Conclusion
The following conclusions were drawn from the findings:
- As a result, we conclude as researchers that the summary findings of our study show that there are significant differences in a preservice teacher's mastery, performance approach, and performance avoidance, as well as a significant difference in assessing mathematics achievement goals among Teacher Education Students when group according to: a. Gender   b. Course and Year Level   c. Age
- We also conclude that achievement goals between Math and non – Math preservice teachers are not significantly different.
- We conclude that achievement goals of pre service teachers are differentiated relative to the standard or criterion used to judge competence.
- The respondents were focused on mastery-approach goals. Furthermore, the respondents' goal is to study, learn, and comprehend the subject of mathematics.
- There is no significant difference in mathematics performance approach based on sex thus the null hypothesis of performance avoidance is rejected. Moreover, sex was not found to be predictor of mathematics performance regardless of what achievement goals they hold.

Recommendation
This study revealed that assessing mathematics achievement goals among Pre-service teacher. This research study will help students to normalize the concept of having mathematics achievement goals and to minimize the failure in academic in relation to mathematics. This will also allow them to assess the importance of having mathematics

77

achievement goals in academic system to reach their desired outcomes especially in their future career as educators. But, in the survey form theirs a question such as "I worry about the possibility of getting a bad grade in mathematics class". There's a lot of students worried in getting bad grade in mathematics class. And since in terms of year level, there is a significant difference in the mastery approach categorized according to year level. This indicates that the mastery approach of the college students is different across year level. Post Hoc Tukey's tests below reveal that first-year college students have better mastery approach, with a mean of 4.26 as compare to the fourth-year college students. All the other pairwise comparisons are not significantly different. So, meaning, this study recommended that used efforts to improve student's mathematics learning should be informed by scientific evidences, and their effectiveness should be evaluated system antically. Such efforts should be coordinate, continual and cumulative. Additional research should be undertaken on the nature development and assessment of mathematical achievement.

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78