Personal, Cognitive and Metacognitive Factors of Preservice Teachers' Performance in the College-Based Leaving Examination: Mathematical Models

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Abstract: This study examined some personal, cognitive and metacognitive factors that could predict the performance of the preservice teachers in the leaving examination, an institutionalized mock board examination given before their practice teaching deployment. Quantitative research designs were employed. Repeated-Measures ANOVA and Stepwise Multiple Linear Regression were used in the analysis. The study involved 100 preservice teachers who took the examination in the second semester of the academic year 2017-2018. They were asked to accomplish the Grit Scale, Approaches and Study Skills Inventory for Students (ASSIST), Academic Motivation Scale (AMS-College Version), and Learning Strategies Questionnaire (LSQ). The study revealed that grit, resource management learning strategy, and course influence (parents) were significant predictors of the preservice teachers' performance in the general education leaving examination. On the other hand, the combination of metacognitive learning, resource management strategy, grit, and cognitive learning strategies significantly predicted the preservice teachers' performance in professional education leaving examination.

Keywords: Academic Drive, Cognitive Strategies, Grit, Teacher Education, Learning Strategies, Learning Approaches, Metacognitive Strategies, Preservice Education

1. Introduction

One index of quality instruction in Teacher Education Institutions (TEIs) is the graduates' performance in the Licensure Examination for Teachers (LET) (Ferrer, Buted & Ferrer, 2015). To reach the minimum qualification to exercise their profession, teachers are mandated to take the licensure examination and the government is regularly conducting quality checks by continuously looking into the caliber of graduates through these licensure examinations. Specifically, the TEIs have exerted efforts to assure that their graduates will certainly do well in the LET. The examination is given by the Philippine Regulations Commission (PRC) twice a year for prospective teachers in response to the mandate of Republic Act No. 7835 which stipulates that no teacher is allowed to practice the teaching profession without obtaining a license.

Recent results of the LET, however, reveal an unsatisfactory performance by prospective teachers, both in the elementary and secondary levels. For the past five years, the national performance is below the

50% passing rate. The March 2018 LET, for example, reveals a distressing result. The PRC announced that only 36,710 teachers out of 134, 996 examinees (27.19%) passed the Licensure Examination for Teachers. In the September 2018 LET, there are only 18,409 elementary teachers out of 90,750 examinees (20.29%) and 60,803 secondary teachers out of 126,582 examinees (48.03%) who successfully passed the exam (PRC, 2018).

At the Nueva Vizcaya State University – Bambang Campus, a public university located in Northern Philippines, one measure taken by the administration and the College of Teacher Education to improve the performance of its graduates in the licensure examination is the Leaving Examination (mock licensure examination). The leaving examination is a mock board examination which simulates the licensure examination for teachers. It is given twice a year, every May and November, which has started in 2017. The leaving examination follows the same components and competencies specified in the National Competency Based Teacher Standards (NCBTS), similar to that of the LET. There are three areas being tested: Specialization, General Education and Professional Education. One of the purposes of the leaving examination is to screen those preservice teachers who will be deployed for their practice teaching. But more importantly, the exam aims to screen those preservice teachers who are not yet ready to take the national licensure examination. Those who failed to pass all components of the leaving examination are mandated to enroll review and crash course programs. This is one of the quality control interventions of the college and the university.

Since its outset in 2017, the institutionalized leaving examination seems to have a good impact on the previous results of the LET. During the 2017 licensure exam, 23 out of 25 (92%) of those who took the national exam passed at the elementary level and 49 out of 60 (82%) in the secondary level. Likewise, during the March 2018 LET, 87.10% passed at the elementary level while 80.95% passed at the secondary level. Students who have taken the licensure exam were those who passed the leaving examination administered by the college. These results indicate that students' success in the leaving examination could predict those who are likely to pass the LET. But the validity of this assumption is yet to be proven.

However, the conduct of the leaving examination had evidently posted two serious consequences among the stakeholders of the college. Firstly, there was a delayed graduation among failed students, and secondly, an increased financial burden to parents due to students' prolonged stay in the university. These outcomes and their recurrence, however, may be prevented if the university will start at an earlier stage. If only the students who enroll in college were screened before they were accepted, or if they were properly guided through interventions provided at the very onset of their endeavor, these drawbacks may have been reduced and prevented. But this raises more questions: How should students be screened? What should be the basis for interventions? What aspects should be considered in "shepherding" the students? This study was conceptualized for these reasons.

This study sought to examine some personal, cognitive and metacognitive factors that significantly and parsimoniously predict students' performance in the leaving examination that may serve as bases for "shepherding", interventions, screening and guidance counseling. This research endeavor sought to identify some internal traits of students taking up teacher education that could be used to success or failure in the leaving examination. These factors include the preservice teachers' academic drive and

influence in their choice teacher education course, grit, learning strategies and their dominant learning approaches.

Specifically, this study determined whether these personal, cognitive and metacognitive factors could predict their performance in the two components of the leaving examination, namely General Education and Professional Education. This sought answers to the following questions:

1) What is the motivation of the preservice teachers in their choice of teacher education course?
2) What is their grit level?
3) What is their dominant approach to learning?
4) What is the level of their cognitive, metacognitive and resource management strategies of learning?
5) What is their performance in the General Education (GenEd) and Professional Education (ProfEd) components of the leaving examination?
6) Is there a significant difference between their approaches and strategies in learning?
7) Is there a significant amount of variation in their performance in (a) general education, and (b) professional education components of the leaving examinations that can be explained by a linear combination of the selected predictor variables?

2. Conceptual and Theoretical Frameworks

2.1 Grit

Grit is a quality that an individual possesses, which empowers him to persevere while facing struggles and obstacles. This can help him attain success. Gritty people do not give up easily and struggle until they reach their goals. Grit originated from and was proposed by Duckworth, Matthews, Kelly and Peterson in 2007. Grit is the "quality of maintaining resilience and perseverance while experiencing obstacles and struggles in working towards meeting the goals" (Duckworth, Peterson, Matthews & Kelly, 2007). This trait is viewed as a major aspect of a mindset development since it centers around the significance of change and adaptation as required in the learning process, not simply on effectively achieving the goal. Grit is studied in the discipline of educational psychology and is considered a "non-cognitive factor" which is vital for school and life achievements (Duckworth, Quinn & Seligman, 2009).

2.2 Self-determination Theory (SDT)

The SDT was proposed by Deci and Ryan, (1985) and Ryan and Deci (2000). This theory explains the idea of how the direction and strength of motivated behaviors are fueled by an individual's intrinsic drive (Kanfer et al., 2008). Individuals tend to participate in a task when they find it enjoyable (Patall, Cooper, & Robinson, 2008). Likewise, people who are intrinsically driven have been found to be more participative and more active in the teaching and learning process (Benware & Deci, 1984; Simons, Dewitte, & Lens, 2004). The SDT explains how individuals find challenging tasks enjoyable and interesting, and how this affects their choice of engagement in the task and how they persist beyond the point at which they are rewarded (Deci, 1972). For instance, Gottfried (1985) found that people who are driven intrinsically are more likely to persist longer on tasks, which, in return, brings better academic performance. Grant (2008) also unveils how their motivation yields better job performance. Similarly,

Vansteenkiste, Lens, and Deci (2006) found how people's intrinsic drives yield better and higher test performance.

2.3 Approaches to Learning

Two of the basic concepts used in this study were the ideas of deep and surface learning. These ideas were conceptualized by Ference Marton and Roger Saljo who posit that when learners undertake an academic task they can adopt two types of learning - an approach to learning that is focused on understanding (deep learning), or another that is focused on reproduction (surface learning) (Marton, Hounsell, & Entwistle, 1997). These two concepts were utilized in the study to understand how students attack the various learning activities given to them. These approaches to learning were laid to two basic learning theories: behaviorism and constructivism. Surface (superficial) learning is deeply rooted from the behaviorist theories of motivation. Superficial learning, unlike deep learning, is extrinsically motivated. This learning is highly encouraged by assessment strategies that focus on recall, rehearsal, or application of trivial types of knowledge, or those evaluation techniques that develop anxiety among learners. Also, this is learning approach is stimulated by the excessive number of materials demanded by the curriculum, absence of progress feedbacks from the teachers, lack of studying independence and low level of interest in, and prior knowledge of, the topic. Deep learning is established through the application of knowledge and not just leaving this bank of knowledge inactive. This learning encourages the brain to work through activity and application of knowledge. Deep learning focuses on how knowledge is constructed instead of how knowledge is received. This is laid on the constructivists' perspective. For the deep learning approach of learning to be developed from the students, teachers need to 'let go' of the concept that learners have to be confined in the classroom, rather, be given freedom to learn and chase knowledge (Cohen, Manion, & Morrison, 2007).

Entwistle, McCune, and Tait (2006) defined the strategic learning approach as the type of learning approach utilized by students who, depending on the situation, use both the surface and deep approaches in achieving their goals. They use the approach based on what is required by the situation or depending on what is required in the assessment they are to undertake. Learners using such approach use "cues and clues" and are motivated by the possible outcome they may achieve from the assessment (Entwistle, McCune, & Tait, 2006).

2.4 Strategies in Learning

Learning strategies are other factors that develop students' academic performance. These learning strategies can be classified as cognitive and metacognitive strategies. Cognitive strategies serve as essential instruments for students to solve problems. In its simplest form, cognitive strategies can be described as the use of one's mind or cognition to solve or complete certain tasks. As defined by Bereiter and Scardamalia (1987), cognitive strategies are procedural facilitators, or as Rosenshine (1997) defined, these are referred to as procedural prompts. On the other hand, Palincsar and Brown (1984) call them scaffolds. The cognitive strategies used in this study include rehearsal, elaboration, and organization. Rehearsal strategy is used when learners practice their needed material through studying visuals, verbalization, or any other means of repetition of target information. Elaboration strategy is utilized through relating other information to the target information, such as making analogies and creating related phrases. Finally, organization strategy is utilized when the learners try to sequence information for a more efficient way of recalling of concepts (Rosenshine, 1997).

John Flavell introduced the word metacognition in 1970's. He viewed it as the learner's conception and knowledge of his own cognition. He advocated that cultivating metacognition among learners may lead to their awareness of the learning process and learning strategies that may bring success. Students equipped with the knowledge of their own cognition understand their own ways of thinking and learning, and hence are more capable of selecting and discriminating their needed strategies to attack a certain problem. With these abilities, they can come up with a better plan to proceed to a certain task, find probable solutions to the problems they might meet and assess themselves after the completion of their task (Zhang & Goh, 2006). According to Goh (2008), teachers must strive to enhance the learners' own metacognition and educate them how to use metacognitive strategies that they may discover effective for each of them in the accomplishment of their learning tasks.

3. Methodology

3.1 Research Method and Design

This study utilized descriptive, comparative and predictive correlational research designs in order to explain the personal, cognitive, and metacognitive factors that affect the preservice teachers' performance in the General Education and Professional Education Leaving examinations.

3.2 Population, Samples and Sampling Procedures

Preservice teachers of the College of Teacher Education, Nueva Vizcaya State University, Bambang Campus who were enrolled in Review Courses (SY 2017-2018) were selected to participate in this study. One hundred (100) preservice teachers, taking up Bachelor of Elementary Education (BEED) and Bachelor of Secondary Education (BSED) was randomly selected from the population using the fishbowl technique. The BEED preservice teachers were specializing in General Education (GEE) while the BSED were specializing in Social Studies (SS), Physical and Biological Sciences (PS-BS), Music, Arts, Physical Education and Health (MAPEH).

3.3 Data Gathering Instruments

This study utilized five (5) survey questionnaires in gathering the needed data. This includes (a) demographic survey and personal data sheet; (b) Grit Scale; (c) Academic Motivation Scale; (d) Approaches and Study Skills Inventory for Students (ASSIST); and (e) Strategies in Learning Questionnaire (SLQ).

3.3.1 Personal Data Questionnaire

The tool was used to gather preservice teachers' personal profiles, such as name, age, sex, course, and specialization. In this survey tool, the respondents were asked to identify whether teacher education was their first, second, third or last course choice. Also, they were requested to identify the person who influenced them in choosing teacher education. They identified whether their course was their own choice, parents' choice, or have only chosen teacher education due to some factors such as scholarship, or peer pressure. The questionnaire also surveyed the students' high school (HS) grades, high school classification (government, private catholic, private non-catholic) and location (rural, urban). However,

preliminary tests show the nonsignificance of these latter variables. Also, these variables were excluded due to some missing information.

3.3.2 Grit scale

This study measured students' self-reported grit level, using the 8-item Grit Scale (Grit-S) originally developed by Duckworth, Peterson, Matthews, and Kelly (2007) and later revised by Duckworth and Quinn (2009), which has established construct and predictive validity. The tool measured preservice teachers' interests or passion, and their ability to sustain their strength and will in the face of adversity. The tool is a five-point scale ranging from 1 (not at all like me) to 5 (very much like me). To determine the preservice teachers' grit index or level, their responses were averaged. The tool has well-documented reliability, validity and consistency. To confirm this, reliability test was performed. The scale was found to be internally consistent with Cronbach's alpha of .722.

3.3.3 Academic Motivation Scale (College Version)

The instrument was adapted from Koludrović and Ercegovac (2014). The scale, originally developed in 1989 by Vallerand, Blais, Brière and Pelletier, is an application of the Self Determination Theory, which categorizes three types of academic motivation, namely intrinsic, extrinsic and amotivation. Reliability test using Cronbach alpha had shown that the tool has an internal consistency (α=. 805). The highest mean was considered as the main motivation that drives the preservice teachers in choosing teacher education as their career. The motivation is classified as intrinsic (2, 4, 6, 9, 11, 13, 16, 18, 20, 23, 25, 27), extrinsic (1, 3, 7, 8, 10, 14, 15, 17, 21, 22, 24, 28) and amotivation (5, 12, 19, 26). Only intrinsic and extrinsic motivations were considered in this study.

3.3.4 Approaches and Study Skills Inventory for Students

Approaches and Study Skills Inventory for Students (ASSIST) has its origins in the Approaches to Studying Inventory (ASI) which was developed at the University of Lancaster and was designed to specify the relative strengths and dominance of students' approaches in three main dimensions, namely deep, surface and strategic. This questionnaire aims to describe how students go about studying and learning. The technique involved asking the learners a considerable number of questions that overlay to some extent to provide better coverage of the various ways of how students study. There are different versions of the ASSIST that are available for use. However, this study used the shortened version which consists of 18 items with three scales namely: surface, deep and strategic.

3.3.5 Learning Strategies Questionnaire

The scale was a component of the adapted questionnaire from Liu and Lin (2010). The questionnaire was a validated self-report instrument intended to measure students' learning strategies. Since the items were slightly modified to fit within the context, a reliability test was performed (Cronbach's alpha = 0.867). There are three dimensions in the learning strategies scale that were used in this study. These are a) cognitive strategies (rehearsal, organization, practice and deduce), b) metacognitive strategies (critical thinking, self-regulation), and c) resource management strategies (non-informational, and informational). All the items in this scale adapted four-point Likert scale: strongly disagree (1), disagree (2), agree (3), and strongly agree (4). Besides, the scores of all the negatively stated items were reversed before being

calculated. The mean scores per subscale were computed and the highest among the three subscales were used to determine the most dominant strategy of learning used by the respondents.

3.3.6 Leaving Examination

The leaving examination is a standardized, college-based test provided by the College of Teacher Education of Nueva Vizcaya State University-Bambang Campus. The main purpose of the examination is to screen out those who are not yet ready to have their practice teaching or work immersion, and more importantly, those who are not yet prepared to take the National Licensure Examination for Teachers. Failure to pass the said examination disallows the takers to have their immersion. Two components of the leaving exam were used in the study, namely General Education and Professional Education. With permission from the college dean, the exams were administered to 100 preservice teachers. Both examinations have 150 items and the passing score set by the college for the leaving exam which is 50%. This passing score was adapted in this study.

4. Analysis and Discussion of Results

4.1 Preservice Teachers' Motivation in Choosing Teacher Education

To determine the number of preservice teachers who were driven extrinsically and intrinsically in their choice of their teacher education course, the frequency distribution and percentage were analyzed.

Table 1: Number of Preservice Teachers who were Intrinsically and Extrinsically driven on their choice of teacher education course

Academic Drive	f N=100	%
Extrinsically Driven	76	76
Intrinsically Driven	15	15
Extrinsically and Intrinsically Driven	9	9

It can be observed in Table 1 that most of the respondents are extrinsically driven (76%), which means that most of them are motivated to take teacher education as their course because of extrinsic factors. These factors include salary, stability and availability of job opportunities for teachers, socioeconomic status, and even some parental influences. Only 15% among the preservice teachers were driven intrinsically.

These findings are in consonance with the views of Arthur and McMahon (2005) who considers the elements of social, personal, and economic situation as possible factors that could influence a person's choice of career. Further to this view, Hislop-Esterhuizen (2006) added that external factors such as geographic location, socioeconomic status, family composition, parenting style, opportunities for education and work and available financial resources could impact career choices of college students.

4.2 Preservice Teachers' Grit Level

It can be gleaned in Table 2 that the level of grit is high among preservice teachers (M=2.650, SD=0.334). This result suggests that the preservice teachers' level of perseverance to achieve their goal amidst adversities is high. This implies that the preservice teachers do not give up easily, and that they exhaust their effort and struggle until they reach their goals. Thus, this result is a good indication of resilience and perseverance amongst preservice teachers in a public university.

Table 2: The Level of Grit of the Preservice Teachers

	Mean	SD	Qualitative Description
Grit Mean Score	2.650	.334	High Grit

1.00 to 1.74: very low; 1.75 to 2.49: low; 2.50 to 3.24: high; 3.25 to 4.00: very high

This level can further be observed across groups shown in Table 3. It can be observed in the table the means and levels of grit of the respondents when grouped according to their sex, course and specialization are high.

Table 3: Level of Grit of the Preservice Teachers Grouped by Sex, Course and Major of Specialization

Profile	N	Mean	SD	Qualitative Description
Sex				
Female	68	2.679	.313	High Grit
Male	32	2.587	.372	High Grit
Course				
BEED	32	2.743	.289	High Grit
BSED	68	2.615	.344	High Grit
Major of Specialization				
GEE	39	2.743	.289	High Grit
Social Studies and Sciences	34	2.714	.315	High Grit
MAPEH	27	2.527	.349	High Grit

QD: 1.00 to 1.74 = very low; 1.75 to 2.49 = low; 2.50 to 3.24 = high; 3.25 to 4.00= very high

The results in Tables 2 and 3 suggest that, overall, the preservice teachers' level of resilience, perseverance and trait-level passion for long-term goals is high. Hence, this suggests that the preservice teachers are prepared to work strenuously toward difficulties and struggles that may confront them, to continue their effort and enthusiasm over years in spite of disappointment, misfortune and plateaus in progress (Duckworth et al., 2007).

4.3 Preservice Teachers' Dominant Approach to Learning

The dominant approach to learning of the preservice teachers were identified through their individual mean scores and corresponding standard deviations across the three subscales, namely deep, surface and strategic approaches to learning. The most dominant approach was identified as the subscale with the highest mean and the lowest standard deviation. The classification is shown in Table 4.

Table 4: Frequency on Dominant Approaches to Learning of Preservice Teachers

Approaches to Learning	f n=100	%
Surface Learning Approach	40	40
Deep Learning Approach	26	26
Strategic Learning Approach	34	34

It can be observed that most of the respondents were surface learners (40%). There are 26% and 34% who were deep and strategic learners, respectively. This result suggests that most of the preservice teachers see learning tasks as enforced work. They were being motivated by their aspiration to meet minimum requirements with minimum effort and involvement. This result is consistent with the findings shown in Table 1 that students' have higher extrinsic motivation.

According to Cohen, Manion and Morrison (2007), surface learning, unlike deep learning, is extrinsically motivated. This learning is highly encouraged by assessment strategies that focus on recall, rehearsal, or application of trivial types of knowledge, or those evaluation techniques that develop anxiety among learners. Also, this learning approach is stimulated by the excessive number of materials demanded by the curriculum, absence of progress feedbacks from the teachers, lack of studying independence and low level of, interest in, and prior knowledge of the topic (Cohen, Manion and Morrison, 2007). Students with such approach, according to Entwistle and Ramsden (2015), tend to reproduce content rather than seek meaning. They used to study without reflecting on the purpose or value of study and commonly feel anxiety about their work (Enwistle & Peterson, 2004). Also, these students treat their subjects as unrelated bits of knowledge.

4.4 Preservice Teachers' Level of Cognitive, Metacognitive and Resource Management Strategies of Learning

The levels of cognitive, metacognitive and resource management learning strategies of the preservice teachers were determined using the means and standard deviations and interpreting through their corresponding qualitative descriptions. It can be observed in Table 5 that across the three types of strategies of learning, the preservice teachers recorded high levels of cognitive, metacognitive and resource management learning strategies.

Table 5: Level of Cognitive, Metacognitive and Resource Management Learning Strategies of the Preservice Teachers

Learning Strategy	Mean	SD	Qualitative Description
Cognitive Learning	3.006	.367	High
Metacognitive Learning	2.818	.495	High
Resource Management	2.687	.359	High

QD: 1.00 to 1.74 = very low; 1.75 to 2.49 = low; 2.50 to 3.24 = high; 3.25 to 4.00= very high

The results imply that the respondents use the three learning strategies adequately for their studies. These results suggest that the preservice teachers interact well with the material to be learned by manipulating it mentally, such as making mental images or relating new information to previously acquired concepts or skills, or physically, such as grouping items to be learned in meaningful categories or taking notes or making summaries of important information to be remembered.

Similarly, the students tend to do better in trying to understand the way they learn and in monitoring the effectiveness of any specific technique they use, both by self-regulation and critical thinking techniques. Likewise, these results imply that the preservice teachers were good at managing their time and resources, study environment, and they have efficient ways of effort management, and help seeking strategies.

4.5 Performance of the Preservice Teachers in the Leaving Examination

The number of passers and non-passers in the leaving examination were determined in the analysis. In this study, those who got 50% and above are considered passers, according to the Leaving Examination guidelines of the College of Teacher Education.

Table 6 shows the result of the general education component of the leaving examination. It can be gleaned in the table that most of the preservice teachers passed the leaving examination. In general education, 73% passed while only 27% failed the examination.

Table 6: Number of Passers and Nonpassers of the General Education Leaving examination

Examination	Result	f n=100	%
General Education	Failed	27	27
	Passed	73	73
Professional Education	Failed	69	69
	Passed	31	31

The table also shows the frequency and percentage of preservice teachers who passed the professional education component of the leaving examination. It can be observed that, unlike the general education

exam, most of the respondents failed (69%) the exam. This suggests that the respondents find the examination hard.

4.6 Significant Difference Between the Preservice Teachers' Approaches and Strategies in Learning

To determine whether a significant difference exists among the respondents' three approaches to learning, Repeated-Measures Analysis of Variance was used. The following assumptions of the test were met: a) normality of data, and b) the independence of observations. Assumption on non-multicollinearity was also met. Mauchly's test indicated that the assumption of sphericity had been violated, χ^2 (2) = 10.803, p=.005, therefore, degrees of freedom were corrected using the estimates of Huynh-Feldt sphericity (ε = .896) since the epsilon is greater than 0.75.

Table 7: Summary of a One-Way Repeated-Measures ANOVA for Approaches to Learning

Source	SS	df	MS	F	p	Partial η^2
Approaches	.497	1.793	.277	1.478	.233	.020
Error	24.197	129.084	.187			

The results in Table 7 show that there is no significant difference among the three approaches of learning at F (1.793, 129.084) = 1.478, p=0.233, partial η^2 = .020. These results suggest that the respondents use the different learning approaches correspondingly and the use of the various approaches across the respondents is not significantly different. Furthermore, the result shows that the interaction among the three approaches to learning is not significant. The partial eta squared value 0.020 indicates that there are only 2% of variance in each of the interactions and associated error which can be accounted for by that interaction among the different learning approaches.

Similarly, to determine whether a significant difference exists among respondents' strategies of learning, repeated-measures analysis of variance was used. The conditions of independence of observations and normality were also assumed. Mauchly's test, however, indicated that the assumption of sphericity had been violated, χ^2 (2) = 35.610, p<.005, therefore, degrees of freedom were corrected using the estimates of Greenhouse-Geisser sphericity (ε = .717), since the epsilon is less than 0.75.

Table 8: Summary of a One-Way Repeated-Measures ANOVA for Strategies in Learning

Source	SS	df	MS	F	p	Partial η^2
Strategies	3.771	1.434	2.629	17.831	.000	.198
Error	15.226	103.269	.147			

Means Least Significant Difference (LSD) Test: Cognitive > Metacognitive > Resource Management

The results in Table 8 show that there is a significant difference between the three strategies in learning at F (1.434, 103.269) = 17.831, p < .005, partial η^2 =. 198. These results suggest that the respondents' use of the different learning strategies differs significantly. The partial squared eta shows that 19.8% of variance in each of the interactions and associated errors of the different learning strategies can be

accounted for by that interaction among the different learning strategies. Furthermore, the LSD post-hoc comparison also shows that Cognitive > Metacognitive > Resource Management. This result suggests that the preservice teachers use cognitive strategies more frequently than metacognitive and resource management learning strategies. They use rehearsal, elaboration and organization, cognitive strategies more frequently than critical thinking and self-regulation learning strategies.

4.7 Amount of Variation in the Preservice Teachers' Performance in (a) General Education and (b) Professional Education Leaving Examination Explained by the Predictor Variables

Stepwise multiple regression was conducted to determine the best linear combination of preservice teachers' course choice influence, approaches and strategies of learning, grit and academic drive that could explain the variations on the general and professional education scores of the respondents. The assumption of nonmulticollinearity of the predictors was assumed at collinearity tolerance values near 1.0 and VIF values lower than 5 (Ringle, Wende, & Becker., 2015) except for strategic learning which failed the assumption. Hence, the variable was excluded from the analysis.

Table 9: Stepwise Multiple Regression Analyses for Variables Predicting General Education Leaving Examination Scores

Variable	B	SEB	β	t	p
Constant	23.103	8.066	-	2.864	.006
Grit	11.232	2.677	.390	4.196	.000
Resource Management	10.375	2.474	.389	4.194	.000
Course was Parents' choice	-4.456	1.758	-.222	-2.534	.014

Note: Adj. R^2= .448, F(3,97)= 20.522, p<.005

It can be seen in Table 9 that there were 3 variables which have been identified as significant predictors of the preservice teachers' performance in the leaving examination in general education. This combination of variable significantly predicted performance F (3,97) = 20.522, p<. 005, with all three variables significantly contributing to the prediction. The adjusted r squared value is 0.448 corresponds to 44.8% of the variation on the scores in general education leaving examination.

The regression equation model for General Education (GenEd) Examination scores was:

GenEd Score = 23.103 + 11.232(grit) + 10.375(resource management) - 4.456(parent chosen course)

The result implies that the model can predict almost half of the total variance on their scores. The remaining half of the variations can be explained by other variables not included in the study. The beta weights suggest that gritty persons, with resource management learning approach and whose course was not chosen by their parents, are more likely to get high scores in the leaving exam.

Table 10: Stepwise Multiple Regression Analyses for Variables Predicting Professional Education Leaving Examination Scores

Variable	B	SEB	β	t	p
Constant	13.316	8.069	-	1.650	.104
Metacognitive Learning	11.173	2.300	.517	4.857	.000
Resource Management	9.066	3.260	.304	2.781	.007
Grit	6.157	2.262	.191	2.722	.008
Cognitive Learning	-4.647	1.966	–.159	-2.363	.021

Note: Adj. R2 = .687, F (4,96) = 40.550, p<.005

On the other hand, Table 10 shows there are four variables that could predict the performance of the preservice teachers in the professional education leaving examination. The combination of metacognitive learning, resource management strategy, grit and cognitive learning strategy could predict significantly, the preservice teachers' performance at F (4,96) = 40.550, p<.0005. The adjusted squared r value of 0.687 suggests that 68.7% of the variation in the scores can be predicted by the model, and the remaining can be explained by other variables. The beta weights in the model suggests that gritty students who use metacognitive and resource management learning strategies tend to score higher in the professional education leaving exam, while those who used cognitive strategies such as rehearsal and practice got lower scores.

The regression equation model for preservice teachers' scores for Professional Education (Prof Ed) was:

Prof Ed Score = 13.316+ 11.173(metacognitive strategy) + 9.066(resource management)

+6.157(grit) - 4.647(cognitive learning)

The significance of cognitive and metacognitive strategies in learning has already been discussed in various researches. Swanson (1990) whose study focused on problem-solving abilities of students have shown that cognitive and metacognitive strategies can compensate for intelligence quotient and lack of prior knowledge. Rosen, et al. (2010) found that students who utilize higher cognitive and metacognitive skills are more likely to be resilient against outside factors that affect their learning. Likewise, Camahalan (2006) found that students who practice metacognitive strategies, and are allowed to self-regulate are more likely to succeed academically. Furthermore, Montague, Enders and Diez (2011) revealed that metacognitive strategies paired with cognitive strategies provide a synergistic effect towards students' understanding and problem-solving abilities. A local study conducted by Gurat and Medula (2016) revealed that metacognitive strategies help students to arrive at a sophisticated mathematical solution. Moreover, these strategies, combined with other factors, determine their success or failure in accomplishing mathematical tasks. Furthermore, utilization of metacognitive strategies in the problem-solving process helps students to gain greater success rate in arriving at the right solutions. On the other hand, failure to use the metacognitive strategy correctly may also lead to confusion or frustration. Ceril (2010) and Cadoy (2001) likewise recommended that students with different learning types need to improve their cognitive and metacognitive learning strategies to enhance learning and performance.

The critical role of an individual's grit has also been discussed in many studies. Recent contributions in the field of research confirm that grit is a significant factor that would affect an individual's persistence and performance, both in personal and academic context. Wolters and Hussain (2014), for instance, have found that grit is stronger and more significant predictor of college students' academic success, more than their high school grades and entrance examinations. Nelson (2016) also highlighted the significance of grit in explaining students' achievement and persistence.

Aside from these factors, some researchers found that some personal and psychological factors do affect preservice teachers' success in their academic endeavor and in licensure examinations. Pascua and Navalta (2011), for example, have found that students' level of motivation, gender and career preferences were found to be personal factors that serve as the strong determinants of Board Examination Performance. Quiambao et al. (2015), on the other hand, revealed that preservice teachers' high-level motivation, perseverance and motivation are strong factors of students' success in the licensure examination.

5. Conclusion

Most of the preservice teachers who took the leaving examination were extrinsically motivated in taking teacher education as their course. Most of them were surface approach learners who see the tasks as enforced work and were motivated by their aspiration to meet minimum requirements with minimum effort and involvement. They have high level of grit which was found to significantly predict performance in both general education and professional education leaving examinations. Among the 11 selected regressors and discriminants, only course choice influence, grit, and learning strategy were found to be the significant factors that can be used in the analysis and improvement of preservice teachers' performance in the leaving examination. The model predicting preservice teachers' performance in General Education examination suggests that gritty persons, with resource management learning approach and whose course was not chosen by their parents, are more likely to get high scores. On the other hand, the model predicting their performance in Professional Education examination suggests that gritty students who use metacognitive and resource management learning strategies tend to score higher in the professional education leaving exam, while those who use cognitive strategies (such as rehearsal and practice) get lower scores. Hence, focus on these factors found to be significant predictors and how they can be improved may help with the problem with the low passing rate of the students in the institutionalized leaving examination.

6. Recommendations

Based on the findings of this study, the following are recommended:

1) That teachers, mentors, guidance counselors, and administrators work hand-in-hand in letting students realize the importance of grit and perseverance in achieving success. Grit was found to be an important predictor of learning, hence, enhancing grit among students may help elevate the performance of the students for the benefit of the students, as well as the institution;
2) That the administrators help students with their informational resource management strategies through the improvement of school facilities, such as communication facilities, computers, and internet connections;

3) That teacher encourages students to share resources through varied means and communications to improve resource management strategies among learners;
4) That students be encouraged to use metacognitive learning strategies in their classroom activities. Teachers may provide learning opportunities that could indulge students to self-regulation and critical thinking strategies;
5) That parents be oriented that parent-choice courses do not help in the improvement of student learning; and
6) That the identified variables – grit, cognitive and metacognitive and resource management learning strategies, course choice influence – be used by the administration and guidance office in the early-stage screening, shepherding and interventions to reduce the number of failures in the leaving examination.

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