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## RESEARCH ARTICLE

### METACOGNITIVE STRATEGIES INVENTORY AND STUDENT BASED FACTORS: BASELINE FOR AN INSTRUCTIONAL INTERVENTION A METACOGNITIVE APPROACH

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#### ABSTRACT

The study was pursued to come up with inventory metacognitive strategies of the First Year College of Education students at Eastern Samar State University Salcedo Campus. The study was conducted during the second semester school year 2013-2014 to 147 students. The descriptive-correlation survey method was utilized in the study using questionnaires to determine the student based profiles and the metacognitive strategies of the first year teacher education student of Eastern Samar State University Salcedo Campus school year 2013-2014. The data collected were summarized, tabulated, categorized and analysed using frequency counts, percentage and mean. The Cramer's V was computed to test the null hypotheses. The level of significance was set at 0.05 for rejecting and accepting the hypotheses. Based on findings of the study, first year teacher education students at ESSU Salcedo campus are generally females, within the appropriate age for first year and are mostly average learners. A greater percentage are fairly motivated and fairly engaged on their academic task. These students are generally practicing metacognitive strategies in all their academic undertakings although some of them still need to acquire their metacognitive skills for effective cognitive processing and successful learning. The metacognitive strategies indicate that students are capable of explicitly thinking about their ideas or conceptions held. There are metacognitive strategies that posted positive relationship to student based factors however there are specific student based factors that are not associated.

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## INTRODUCTION

The aim of teacher education institution is to develop teachers competent in the delivery of curriculum. It is deemed that teacher education students should benefit instructions by developing their thinking skills as effective learners. Expectedly, students devise their learning a strategy, which is an indispensable aspect of ones thought processes. Learning how to learn plays a significant role in accomplishing a learning goal. The process of knowing how to attend a particular stimulus in the environment, how it is perceived as important, how to decide it, how to transfer it first to the short-term memory, and how to retrieve such information when needed, and other manipulation activities accounts not only for cognitive but metacognitive tasks as well. This idea on how much knowledge one has about his own thought processes and how significant knowledge has for learning gives rise to what is metacognition. One of the competences that should be assumed by a teacher education graduate, based on (CMO 30, s. 2004, Sec 1, Art. 2).

Is the understanding of the learning processes so that they could facilitate students learning and will continue learning in order to better fulfil their mission. The Pre-service teachers should therefore undergo training that will maximize their cognitive structures. With, the fast pace in technology change, one's preparation can become obsolete in a matter of years. The implications of such rapid technological development are the heightening of the need for learning throughout life.

Metacognition in this context is cognition about cognition (Santrock *et al.*, citing Miller *et al.*, 2006). For instance, students will devise a strategy to learn the material better. They use mnemonic devices so that they can easily recall the information. At times, they will not only think in words but also in pictures and spatial relationship. They pause for a moment and think; they use their sensory images and mental imageries to form the information previously perceived. Using visual imagery, students are able to add complexity and richness of the material to their thought processes. Once they become aware of their own thinking and do something for regulation and monitoring, they are starting to recognize the role of metacognition in learning. The metacognition knowledge is higher-order cognition used to monitor and

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regular thought processes such as reasoning, problem solving, learning, and so on (Woolfolk citing Metcalfe & Shinamura, 2007). It is therefore clear that metacognition is a process of knowing how students think and their ability to control or regulate it.

Issues on the culture of the classrooms, lifelong learning concerns students' practices in attending academic activities. Students learn best when engrossed in the topic, motivated to seek out new knowledge and skills because they need them in order to solve the problems at hand. The goal is active exploration, construction and learning rather than passivity of lecture attendance and text book reading. The challenge for teachers is to integrate more activities that would build the students' capacity to reflect on their own characteristics as learners, the task they are to do and the strategies that they can use to learn.

Likewise, another important dimension in the classroom is individual differences in terms of intelligence, learning ability, or the ability to profit instruction. The average classroom will contain students with exceptionalities, varying learning styles and personalities. Other classrooms may have students with cognitive disabilities who require extra help and support to reach their full potential. Teachers provide this support through a warm academic climate, effective management and the use of time through defined instruction, or by ensuring high success rates and effective feedback. Additionally, technology, in the form of computers, can help teachers deliver instruction more effectively as well as monitor the progress of their students. Yet, teachers can promote the awareness, diversity by informing students about effective problem solving strategies and discussing cognitive and metacognitive practices.

For the last five years, the College of Education at Eastern Samar State University has been confronted with academic issues that affect how students appreciate and accomplish learning tasks. This condition eventually advances to drop outs if not poor academic performance. Other than economic reason, is the inability of the students to cope with the hassles of academic realities, especially in the performance tasks required in each courses. Interviews and other means of gathering information have shown that students' simple failure to present a learning output becomes the grand reason for the drop out.

Additionally, students' academic performance during the first year of their enrolment have shown the teacher education students could hardly accomplish learning tasks and present appropriate learning evidences. These are actual manifestations that they do not have the full awareness of who they are as learners and how they should work on tasks that need personal attention. It is on this premise that the researcher pursued this study, so that the inventory of their metacognitive strategies and some student based factors will serve as baseline for crafting an instructional intervention that utilizing the metacognitive approach.

### Statement of the Problem

The study was pursued to come up with an inventory metacognitive strategies of the First year Teacher Education

students in the College of Education at Eastern Samar State University Salcedo Campus, School Year, 2013-2014.

Specifically, answers to the following questions were sought;

1. What are the student based factors of the First year Teacher Education Students in terms of:
  - a. Age
  - b. Gender
  - c. High School Grade Point Average (GPA)
  - d. Learning Style
  - e. Level of Motivation and
  - f. Students' Academic Engagement?
2. What are the metacognitive strategies of First year teacher Education students in terms of;
  - a. Motivation
  - b. Organizing and Planning Work
  - c. Working with others, utilizing resources and feedbacks.
  - d. Managing school work stress
  - e. Note-taking and reading
  - f. Preparing an assignment/project?
3. Is there significant relationship between the student based factors of the First year and their metacognitive strategies in terms of;
  - a. Motivation
  - b. Organizing and Planning Work
  - c. Working with others; Utilizing resources and feedbacks.
  - d. Managing school work stress
  - e. Note-taking and reading
  - f. Preparing an assignment/project
4. What instructional intervention will be developed based on the findings of the study?

## METHODOLOGY

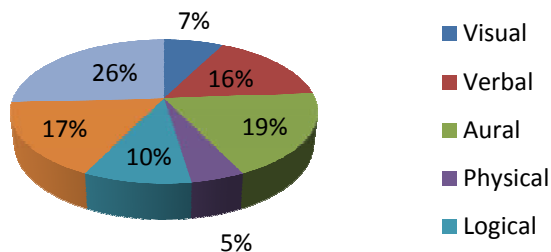
This study utilized descriptive-correlational method of research where survey questionnaire was used to gather the data needed such as the student based profile and the metacognitive strategies. This is a descriptive research since it described the characteristics of the respondents in terms of their metacognitive strategies and the characteristics of the respondents in terms of their student based factors. Correlation research was employed because the relationship existing between the different variables was determined. The study was conducted during the second semester school year 2013-2014 to 147 first year College of Education students of Eastern Samar State University, Salcedo Campus, who were selected using simple random sampling specifically using the lottery method. The data collected were summarized, tabulated, categorized and analysed using frequency counts, percentage and mean. The Cramer's V was computed to test the null hypotheses. The level of significance was set at 0.05 for rejecting and accepting the hypotheses

## RESULTS AND DISCUSSION

Data presented here clearly indicates that the first year teacher education is dominated by females with ages between 15 and 19 and with high school grade point average between 80-89. This very high representation of females actually prevails in schools today, in the paper presented by Savellano (2008) in terms of gender, tertiary education female enrolment exceeds that of the male. Accordingly, Ibe (2009) disclosed that 95 percent females who enroll teacher education program are fresh graduate from their secondary education. These students immediately proceed college. In addition, Savellano (2008) revealed that greater chance of passing the Licensure Examination for Teachers are average students whose grade point average is 85 to 90. Average students according could be trained and equipped with skills as future teachers.

**Table 1. Student Based Factors In terms Of Age, Gender and High School Grade Point Average of First Year Teacher Education Students of ESSU Salcedo, S.Y. 2013-2014**

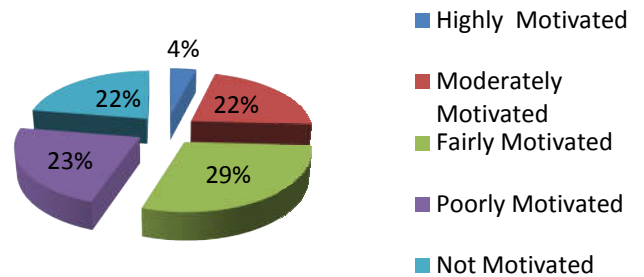
Age	Frequency	Percent
15-19 years old	121	82.3
20-24 years old	20	13.6
25-29 years old	4	7.7
30-34 years old	1	.7
35-40 years old	1	.7
Total	147	100
Gender		
Male	37	25.2
Female	110	74.8
Total	147	100
High School GPA		
70-79	3	2.0
80-89	128	87.1
90-99	16	10.9
Total	147	100



**Fig. 1. Student Based Factors In terms of Learning Style Inventory of First Year Teacher Education Students of ESSU Salcedo, S.Y. 2013-2014**

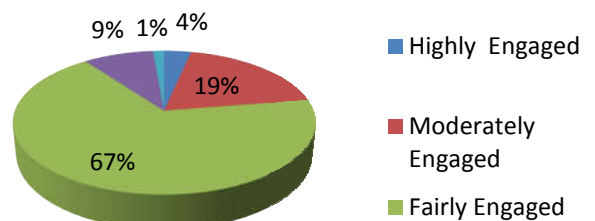
Result simply shows that in the first year teacher education students, 7 percent are visual learners, 16 percent first year students are verbal, 19 percent are aural learners, 5 percent are physical learners, 10 percent are logical learners, 17 percent are social and 26 percent are solitary learners. Kolb (1995) explains that individuals exhibit preferences for learning behaviors. Learning style of teacher education students vary. A greater portion represents verbal learners, others are aural learners still others are solitary learners. However, most of them effectively learns when working alone. Considering the number representing verbal learners for example result imply that these students get more out of words written and spoken

explanations. This condition presents huge implication to teaching and the way they learn. Lessons should be tailored to accommodate the varying styles of learning so that they can effectively respond and process learning events.



**Figure 2. Student Based Factors In terms of Level of Motivation of First Year Teacher Education Students of ESSU Salcedo, S.Y. 2013-2014**

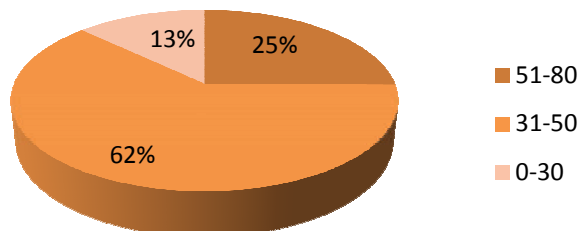
Considering the level of motivation as student based factor, presented in Figure 2 is the data generated. With the 147 teacher education students, there were only 4 percent who are highly motivated, 22 percent were moderately motivated, 29 percent were fairly motivated. Lastly, from the total respondent 23 percent are poorly motivated and 22 percent are not motivated. Most educational psychologists agree that effective learning requires students to self-regulate their cognition and motivation. The influence motivation affects the quantity and quality of their willingness to engage and persist in academic tasks (Wolters, 2006). Based the data teacher education students are fairly motivated. Hence, it could be deduced the exposing students to learning tasks of their interest is necessary. Their ability to control aspects of their motivation through the use of various metacognitive strategies have an impact on their academic learning and achievement. (Zimmerman 2007)



**Figure 3. Student Based Factors In terms of Level OF Student Engagement of First Year Teacher Education Students of ESSU Salcedo, S.Y. 2013-2014**

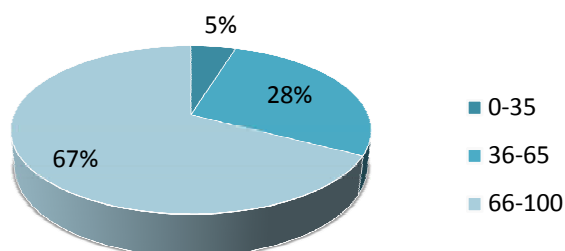
The level of students' engagement is illustrated in in Fig. 3. As revealed, there are 4 percent who are highly engaged in his/her studies, 19 percent are moderately engaged. Likewise, it could be seen that 67 percent are fairly engaged, 9 percent are poorly engaged and two or 1 percent are not engaged at all in his/her college education. This result pointed out that most of the students are fairly engaged. The scenario mostly happens on this year level especially because first year students are still on

the period of adjustment to college life, especially that they are on teacher training institution. Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimize the student experience and enhance the learning outcomes and development of students (Trowler 2010).



**Figure 4. Metacognitive Strategies Inventory In terms of Motivation of the First Year Teacher Education Student of ESSU Salcedo, S.Y. 2013-2014**

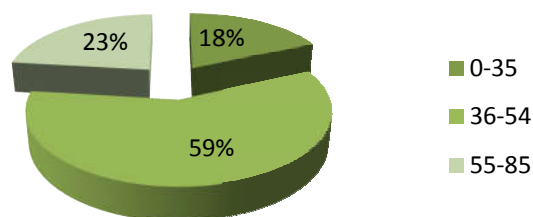
As one of the factors on metacognitive strategies, students' motivation was indicated. This was shown on the scores obtained on the questionnaire they have responded. Thus for students who obtained scores between 51-80, there were 252 percent of the total respondents. 62 percent of the respondents had scores between 31 and 50. On the other hand, those who scored 0- 30 were 13 percent. This means that a larger group of students had scores within 31 and 50. This means that these students sometimes get down to work but can be distracted, they are not always certain why they have to work. They need to learn more techniques to get them down to work more consistently and work it. Those who scored higher indicates that they do not appear to have many problems in getting down to work and keeping to it. Finally, those who obtained the lowest score signify that unless they develop the skill in this area, they are likely to have many unsatisfactory experiences throughout student life. Baker, (2003) as cited in the work of Zimmerman (2007) emphasized that these are the same group of students who are likely to drop from schooling.



**Figure 5. Metacognitive Strategies Inventory In terms of Organizing and Planning Work of the First Year Teacher Education Student of ESSU Salcedo, S.Y. 2013-2014**

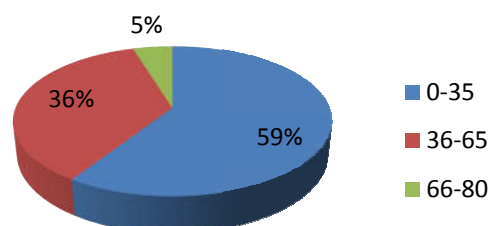
It has been shown in the result that a larger group of teacher education students attained score within 66 to 100. This connotes that these students are well organized and plan their

work ahead of time. Hence, the same students are likely to succeed in all their academic undertakings. Those who scored 36 to 65, show that they are not well organized and their time management should be studied and improved.



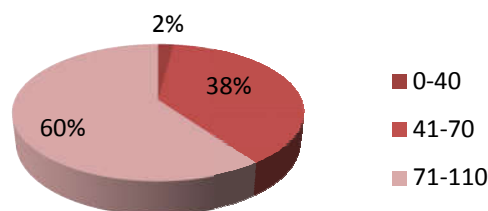
**Figure 6. Metacognitive Strategies Inventory In terms of Working with others and Utilizing Feedback of the First Year Teacher Education Student of ESSU Salcedo, S.Y. 2013-2014**

Most of the students here scored 36 to 54 which imply that they might have collected resources but still need to understand how will use it effectively. Also, those who obtained scores of 55 to 85 signifies that they made the full use of the resources available, listen well and take active part in the discussion.



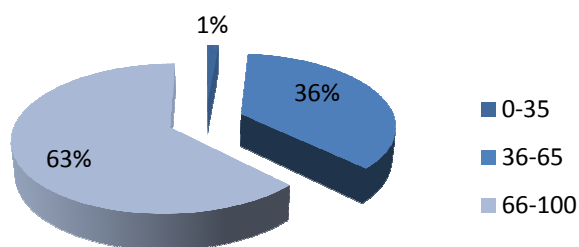
**Figure 7. Metacognitive Strategies Inventory In terms of Managing School Work Stress of the First Year Teacher Education Student of ESSU Salcedo, S.Y. 2013-2014**

Figure 7 presents students metacognitive inventory in terms of managing school work stress. It is shown that out of 147 students, 59 percent had scores between 0-35, 36 percent got scores between 36 to 65, and only 5 percent got scores between 66-80. With the result, majority of them are overwhelmed with problems which will make them less effective as students. Thus they need to acquire skills in stress management. Another set of students manifested that they can handle anxieties and concerns moderately well but could develop skills to manage them more effectively.



**Figure 8. Metacognitive Strategies Inventory In terms of Note Taking and Reading of the First Year Teacher Education Student of ESSU Salcedo, S.Y. 2013-2014**

As indicated by the scores made, 2 percent of them got 0 to 40. Another 38 percent of the students got scores between 41 to 70 while those who scored 71 to 100 were 60 percent of the first year teacher education students. Many students achieved the highest score on these strategies in fact, 60 percent of them. This group of students prepares well and read efficiently, learning as they go. They do not waste time reading irrelevant materials. Those with scores lower manifested that their note taking and reading are already adequate but could still be improved, while some need to take action to succeed in the teacher training.



**Figure 9. Metacognitive Strategies Inventory In terms of Preparing Assignment /Project of the First Year Teacher Education Student of ESSU Salcedo, S.Y. 2013-2014**

Preparing Assignment/Project. Students' responses on this specific tasks or metacognitive practices are shown by the following scores attained. Those whose scores were between 0 to 35 were 1 percent, 36 percent got scores within 36 to 65 ranges. Finally, 92 students made 66 to 100 scores, representing about 63 percent of the total respondents. Results got by 63 percent of the students are evidence that their assignments are well thought of, researched and clearly written. The other group demonstrates the skill in the preparation of assignments and projects but there is still room for improvement.

**Table 2. Relationship Between Age and Metacognitive Strategies Inventory of First Year Teacher Education Students, ESSU Salcedo Campus, S.Y. 2013-2014**

Metacognitive Strategies	Index of Correlation	p-value	Interpretation
Motivation	0.661	0.147	Significant
Organizing And Planning Work	0.903	0.108	Significant
Working with Other and Utilizing Resources and Feedback	0.513	0.157	Significant
Managing School Work Stress	0.296	0.001	Significant
Note Taking And Reading	0.651	0.142	Significant
Preparing Assignment/Project	0.903	0.108	Significant

On Table 2, it could be gleaned that all of the metacognitive practices was positively associated to the student based factor which is age. This is proven by the 0.661 index of correlation and p-value of 0.147 obtained for motivation, organizing and planning work obtained an index of correlation which is 0.903 with p-value of 0.108, working with other and utilizing resources and feedback get an index of correlation which is 0.513 with p-value of 0.157, 0.296 index of correlation and

p=0.001 obtained for managing school work stress, 0.651 index of correlation and p-value of 0.142 for note taking and reading while preparing an assignment/project obtained an index of correlation which is 0.903 and p-value of 0.108. On this regard the null hypothesis of no correlation is rejected. Findings illustrates that age affects how students manage school work stress. Hence the older is the age the higher is their skill in attending to school problems effectively. The result is similar to what Harper (2004) disclosed, in his study when he compared how high school students of different age groups attend to stressful situation. According to the study, younger students were less effective in coping stress that the older group, in fact more that 50% give up earlier as expected.

**Table 3. Relationship Between Gender and Metacognitive Strategies Inventory of First Year Teacher Education Students, ESSU Salcedo Campus, S.Y. 2013-2014**

Metacognitive Strategies	Index of Correlation	p-value	Interpretation
Motivation	0.901	0.023	Significant
Organizing and Planning Work	0.122	0.169	Not Significant
Working with others and Utilizing Resources and Feedback	0.557	0.089	Significant
Managing School Work Stress	0.934	0.030	Significant
Note Taking and Reading	0.332	0.000	Significant
Preparing Assignment/Project	0.274	0.133	Significant

These obtained results had proven that negative association exists on only one variable and with this the null hypothesis hereby accepted. Associations of the five variables to gender namely; motivation, working with others and utilizing resources and feedback, managing school work stress, and note taking and reading and preparing assignment/project could be construed that female students are more successful learners than that males. They have acquired adequate skills on the five strategies that provided them the insight about their cognitive processes. The condition is what differentiates successful learners and less successful learners. According to Flavell (1987) as cited by Zimmerman (2007) students with greater metacognitive abilities tend to be more successful in their cognitive endeavors and benefits much from instruction. His study further established that this is usually exhibited by female students.

**Table 4. Relationship Between HS Grade Point Average and Metacognitive Strategies Inventory of First Year Teacher Education Students, ESSU Salcedo Campus, S.Y. 2013-2014**

Metacognitive Strategies	Index of Correlation	p-value	Interpretation
Motivation	0.810	0.277	Significant
Organizing and Planning Work	0.205	0.142	Significant
Working with others and Utilizing Resources and Feedback	0.802	0.075	Significant
Managing School Work Stress	0.912	0.006	Significant
Note Taking and Reading	0.955	0.048	Significant
Preparing Assignment/Project	0.988	0.038	Significant

The preceding results indicated positive associations to HS grade point average and all of the metacognitive practices;

motivation, organizing and planning work and working with others and utilizing resources and feedback, managing school work stress, note taking and reading and preparing assignment/project. Thus on this regard the null hypothesis of no relationship is rejected. Several studies, (Ablay, 2011, Ofilan *et al.*, 2012; Logrosa, *et al.*, 2012) had shown how grade point average predicts student future academic undertakings. In the present study it was indicated that the high school grade point average were associated to metacognitive strategies like managing school work stress, note taking and reading and preparing assignment/ project. This is an indicator that the higher their high school grade point average the higher is their level of attending to these metacognitive strategies, in like manner the lower is their grade point average the lesser is the level of attention on these strategies. It is on this concern where students need to focus attention on how tasks are accomplished. These strategies need to be established and evaluated for them to discover that understanding and transferring thinking processes improves learning. Expectedly, teachers on the other hand, need to create metacognitive environment, monitor and apply their knowledge, deliberately model metacognitive behavior to assist students in becoming aware of their own thinking.

**Table 5. Relationships between Learning Style and Metacognitive Strategies Inventory of First Year Teacher Education Students, ESSU Salcedo Campus, S.Y. 2013-2014**

Metacognitive Strategies	Index of Correlation	p-value	Interpretation
Motivation	0.350	0.211	Significant
Organizing and Planning Work	0.194	0.233	Not Significant
Working with others and Utilizing	0.155	0.239	Not Significant
Resources and Feedback			
Managing School Work Stress	0.090	0.254	Not Significant
Note Taking and Reading	0.358	0.021	Significant
Preparing Assignment/Project	0.067	0.261	Not Significant

From these data, it was shown that no associations were indicated with learning style and, organizing and planning work, working with other and utilizing resources and feedback, managing school work stress, and preparing assignment and project. Therefore, on this line, the null hypothesis is accepted. But, based on the data an association was revealed between learning style motivation and note taking and reading, thus the null hypothesis here is rejected.

Most of the metacognitive strategies were found not significantly related to learning style. This connotes that learning style has nothing to do with the metacognitive strategies of the students. It is only on motivation and note taking and reading where association was established. Thus it could be concluded that verbal, aural and solitary learners are effective in their motivation and note taking and reading strategies. Literatures on metacognition and learning style underscore that these enable students to successfully cope with new situations. Hence, school library media specialists should capitalize on these talents as well as access a wealth of resources that will create metacognitive environment which fosters the development of good thinkers who are successful problem-solvers and lifelong learners (Davies, 2006).

**Table 6. Relationship Between Student's Motivation and Metacognitive Strategies Inventory of First Year Teacher Education Students, ESSU Salcedo Campus, S.Y. 2013-2014**

Metacognitive Strategies	Index of Correlation	p-value	Interpretation
Motivation	0.325	0.000	Significant
Organizing and Planning Work	0.313	0.000	Significant
Working with others and Utilizing	0.253	0.000	Significant
Resources and Feedback			
Managing School Work Stress	0.227	0.056	Significant
Note Taking and Reading	0.253	0.016	Significant
Preparing Assignment/Project	0.320	0.000	Significant

Table 6 presents the data generated after analysis of relationship between student's motivation and metacognitive strategies was conducted. Here it is displayed that positive associations between student's motivation and all metacognitive strategies was proven to be significant.

Established result proved all of the metacognitive strategies are positively associated. Meaning successful accomplishment of learning tasks is directly affected by these metacognitive strategies. Results conforms to researches (Son, 2004, Dunlosky & Hertzog, 2007) as included in the study of (Scruggs, 2009) which shows that increases in learning is parallel to the students positive attitude towards their metacognitive strategies. Results further suggest that direct teaching of these strategies may be useful and independent use develop gradually (Scruggs, 2009)

**Table 7. Relationship Between Student's Academic Engagement and Metacognitive Strategies Inventory of First Year Teacher Education Students, ESSU Salcedo Campus, S.Y. 2013-2014**

Metacognitive Strategies	Index of Correlation	p-value	Interpretation
Motivation	0.148	0.197	Not Significant
Organizing and Planning Work	0.290	0.002	Significant
Working with others and Utilizing	0.176	0.335	Not Significant
Resources and Feedback			
Managing School Work Stress	0.294	0.181	Significant
Note Taking and Reading	0.195	0.189	Significant
Preparing Assignment/Project	0.142	0.204	Not Significant

On Table 7 is the presentation of the statistical result on the relationship between student's academic engagement and metacognitive strategies. Based on the data the following were drawn no significant relationship is indicated on: student's academic engagement and motivation, index of correlation is 0.148 and 0.0197; academic engagement and working with others and utilizing resources and feedback, 0.176 index of correlation and 0.335 p=value; preparing assignment and project with 0.142 index of correlation and 0.204 p=value. Hence, the null hypothesis of no correlation is accepted. However, it is on the same table where existing correlation between student's academic engagement and metacognitive strategies is revealed. This was shown by the index of correlation of 0.290 and 0.002 p=value for student's academic engagement and organizing and planning work; managing



school work stress with 0.294 index of correlation and 0.181 p value; note taking and reading with 0.195 index of correlation and 0.189 p-value. Accordingly, the null hypothesis is rejected on this regard.

This implies that students' academic engagement is directly associated to metacognitive strategies. On this concern, student's interaction and investment on relevant school undertakings is positively related to how he/she plans and organize work. Hence, students optimize their experiences and enhance learning outcomes and performance through highly organized and carefully planned activities. Additionally, they act on the awareness of this metacognitive strategy, are persistent of their academic achievement and social engagement and tend to learn better. (Schneider & Pressley, 1997)

### Conclusion

Considering the findings of the study, the following conclusion was drawn;

1. First year teacher education students at ESSU Salcedo campus are generally females, within the appropriate age for first year students and are mostly average learners. A greater percentage of them are fairly motivated and fairly engaged on their academic task.
2. These teacher education students are generally practicing metacognitive strategies in all their academic undertakings although some of them still need to acquire their metacognitive skills for effective cognitive processing and successful learning. The metacognitive strategies indicate that students are capable of explicitly thinking about their ideas or conceptions held.
3. There are metacognitive strategies that posted positive relationship to student based factors however there are specific student based factors that are not associated. This resulted to either rejection or acceptance of null hypotheses on particular associations.

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