

Metacognitive Awareness and General Average Grade of 2nd Year BEED and BSE Students of NEUST-SIC

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Abstract— This study focused on the relationship between metacognitive awareness and General Average Grade of the students of Nueva Ecija University of Science and Technology (NEUST-SIC) San Isidro Campus, College of Education. The sample consist of (65)2nd Year Bachelor of Elementary Education students and (102) 2nd Year Bachelor of Secondary Education students. The questionnaire (Metacognitive Awareness Inventory) developed by Schraw and Dennison in 1994 was used to determine the correlation of students' Metacognitive Awareness and Final General Average Grade as well as to identify significant difference on the scores of 2nd year BEED students and 2nd year BSE students respectively. Findings shows that Metacognitive Awareness and Final Average Grade are correlated. It also revealed that the 2nd Year BSE students registered higher in terms of regulation in metacognition compared to the 2nd year BEED students. Thus, it is recommended that more studies in metacognition must be done in all the areas and levels of specialization in the College of Education to determine the necessary skills needed by the students taking up Education as their course that requires metacognitive skills in learning and in teaching.

Keywords— Metacognitive Awareness, General Average Grade, Bachelor of Elementary Education, Bachelor of Secondary Education, Correlation.

I. INTRODUCTION

Metacognition was introduced as a concept and as a field of investigation by John Flavell. He refers to it as "thinking about thinking." It is the capacity to control the way they think by applying strategies such as organization, adaptation, and monitor. It is also the ability to analyze how one process thinking and emotions. With this ability, students will be encouraged to examine how they will learn best, which in turn helps them develop an awareness skill (self-awareness) that is a significant part of learning. Individuals with developing metacognition can fully assess their thought processes and redesign the way they think to adapt to different situations. With the use of metacognition, a learner can easily understand and assess any situation and apply approaches and methods that work best for them. They may be able to compare and discover that a method of learning a particular subject needs more time than another. Or perhaps, a particular technique may be effective in one class but doesn't work for another.

Even though metacognition is important, it is, most of the time, being taken for granted as a component of learning.

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Effective learning involves planning a strategy and setting a goal, progress monitoring, and implement change as required. All of the above-mentioned activities are metacognitive in nature. By acquiring these skills by our students and in all cases can be learned - we can upgrade students' learning.

The present study focused to investigate the relationship between metacognitive awareness and students' general average grade. Since learning is most of the time applied at schools, academic performance reflected in their Grade is one way to assess the students' learning. In this study, students' final general average grade of the 2nd-semester academic year 2018 – 2019 will be used to correlate with their metacognition. Specifically, the research focuses on the following key points:

- 1) Determine the number of affirmative responses of the 2nd year BEED and BSE students on the Knowledge of Cognition and Regulation of Cognition as well as to identify the skills on metacognition that needs improvement.

- 2) Compare the means on the Knowledge of Cognition, Regulation of Cognition, and overall score for MAI of the 2nd Year BSE students and 2nd Year BEED students'.
- 3) Identify the relationship between the metacognitive awareness and general average grades of the 2nd Year BSE students and 2nd Year BEED students.
- 4) Identify the relationship between 2nd Year BSE students and 2nd Year BEED students' regulation of cognition and their final general average grade.
- 5) Identify the relationship between 2nd Year BSE students and 2nd Year BEED students' knowledge of cognition and their' final general average grade.
- 6) Identify the relationship between the knowledge of cognition and regulation of cognition of the 2nd Year BSE students and 2nd Year BEED students.
- 7) Determine the significant difference in metacognition awareness scores between the 2nd Year BEED students and 2nd Year BSE students.

II. METHODOLOGY

A. Participants

Second Year College of Education students of Nueva Ecija University of Science and Technology San Isidro Campus participated in the study. Each one voluntarily answered the Metacognitive Awareness Inventory (MAI) for the duration of the 1st Semester of S.Y. 19-20.

A total of 5 classes completed the MAI that is composed of One hundred and sixty-nine students. One Hundred and Four or 61.54 % were enrolled in Bachelor of Secondary Education (BSE General Science, BSE Mathematics, and BSE Physical Education Majors) while sixty-five or 38.46 % in Bachelor of Elementary Education (BEED).

B. Materials

Metacognitive Awareness Inventory

Developed by Schraw and Dennison in 1994, the Metacognitive Awareness Inventory (MAI) was adapted to measure the student metacognitive awareness. It is made up of fifty-two items wherein students will rate as either true or false. Every "True" answer corresponds to One point while a "False" answer corresponds to Zero points. The MAI has 17 questions related to the knowledge of cognition factor for a maximum score of 17 and 35 questions related to the regulation of cognition factor for a maximum score of 35. Knowledge of cognition factor is further divided into three (3) categories; Declarative Knowledge for item # 5, item #10,

item #12, item #16, item #17, item #20, item #32, item #46; Procedural Knowledge for item #3, item #14, item #27, item #33; and Conditional Knowledge for item #15, item #18, item #26, item #29, item #35. Regulation of cognition is also divided into five (5) categories; Planning for item #4, Item #6, item #8, item #22, item #22, item #23, item #42, item #45; Information management strategies for item #9, item #13, item #30, item #31, item #37, item #39, item #41, item #43, item #47, item #48; Comprehension monitoring for item #1, item #2, item #11, item #21, item #28, item #34, item #49; Debugging strategies for item #25, item #40, item #44, item #51, item #52; And evaluation for item #7, item #19, item #24, item #36, item #38, and item #50.

Overall, the total score is 52. A higher score corresponds to higher metacognitive knowledge (knowledge of cognition) and higher metacognitive regulation (regulation of cognition). In addition to the knowledge of cognition score and the regulation of cognition score, the total score is assessed by getting the sum of all the responses to the questions.

General Average Grade

The General Average Grade for BEED students was provided by computing the average of their subjects for the 2nd semester of school year 18-19. The subjects include the following: Filipino sa Iba't Ibang Disiplina (Fil 2), National Service Training Program 2 (NSTP 2), Rhythmic Activities (PE 2), Facilitating Learner (Prof. Ed 3), Good Manners and Right Conduct (EED 1), Content and Pedagogy for the Mother Tongue (EED 2), and Teaching English in the Elementary Grades (EED 3).

For BSE major in P.E. students the following subjects were computed; Philosophical and Socio Anthropological Foundation (MPE 1), Individual and Dual Sports (MPE3), Filipino sa Iba't Ibang Disiplina (FIL 2), National Service Training Program (NSTP 2), Personal Community and Environmental Health (MPE 4), Anatomy and Physiology of Human Movement (MPE 2), Facilitating Learner (Prof Ed 3). As for BSE major in General Science students, the following subjects were considered; Filipino sa Iba't Ibang Disiplina (FIL 2), National Service Training Program 2 (NSTP 2), Rhythmic Activities (PE 2), Facilitating Learner (Prof. Ed 3), Earth Science (SES 1), Inorganic Chemistry (SES 2), Anatomy and Physiology (SES 3), and Fluid Mechanics (SES 4). Lastly, for the BSE major in Mathematics students, the following subjects were computed; Filipino sa Iba't Ibang Disiplina (FIL 2 BSE), National Service Training Program 2 (NSTP 2), Rhythmic Activities (PE 2), Facilitating Learner (Prof Ed 3), History of Mathematics (SEM 1), College and

Advance Algebra (SEM 2), Elementary Statistics and Probability (SEM 3). All subjects have a unit of 3 except for Rhythmic Activities (2 units) and the National Service Training Program (0 units).

The descriptions follow a descending order wherein an average grade of "1.00" is the highest, and an average grade of "3.00" is the lowest passing general average grade.

C. Procedure

Students general average grade is associated with their score on the MAI. Total sampling was employed, but not all data were retrieved.

III. RESULTS

Table 1. Number of Responses (Affirmative) on MAI by BEED and BSE Students.

	BEED (n=65)	BSE (n=102)	Total (n=167)
Knowledge of Cognition Factor (KCF)			
Declarative Knowledge	242	433	675
Procedural Knowledge	168	292	460
Conditional Knowledge	216	316	532
Regulation of Cognition Factor (RCF) Total	1309	2278	3587
Planning	278	442	720
Information Management	348	621	969
Strategies Comprehension	226	481	707
Monitoring			
Debugging Strategies	237	424	661
Evaluation	220	310	530
TOTAL (KCF + RCF)	1935	3319	5254

Note: The maximum number of responses for KCF and RCF for BEED are 1105 and 2275. While 1734 and 3570 for BSE.

The number of responses of the BEED in the knowledge of cognition is 626 or 56.65 %, while only 1309 or 57.54 % responses for the Regulation of Cognition Factor. Only 1935 or 57.25 % responded true out of expected 3380 responses. For the BSE, there were 1041(60.03 %) and 2278 (63.81 %) responses obtained out of expected 1734 and 3570 for Knowledge of Cognition Factor and Regulation of Cognition Factor respectively. Only 3319 (62.58 %) responses obtained from the maximum number of 5304 expected responses for the combined responses.

Table 2. Means and Standard Deviations of 2nd Year BEED and BSE Students for MAI.

X & SD	MAI	BEED (n=65)	BSE (n=102)	BEED & BSE (n=167)
MEAN	Metacognitive Awareness Inventory (TOTAL)	29.77	30.18	30.95
	Knowledge of Cognition Factor	9.63	9.65	9.74
	Regulation of Cognition Factor	20.14	20.55	21.14
STANDARD	Metacognitive Awareness Inventory (TOTAL)	5.41	6.08	6.16
	Knowledge of Cognition	2.57	2.58	2.52
	Regulation of Cognition	3.96	4.53	6.16

For the 65 2nd Year BEED student respondents, the mean score for the MAI is 29.77 while the mean score for the knowledge of cognition factor is 9.63 and the mean score for regulation of cognition factor is 20.14, respectively. The 102 2nd Year BSE student respondents for the MAI score has a mean of 30.18, and the mean score for the knowledge of cognition factor and regulation of cognition factor was 9.65 and 20.55.

For the 167 combined students from 2nd Year BSE and 2nd Year BEED, the mean MAI score was 30.95. The mean score for the knowledge of cognition factor and regulation of cognition factor was 9.74 and 21.44, respectively.

Table 3. Correlations between General Average Grade and Metacognitive Awareness Inventory Scores of 2nd Year BEED students.

	General Average Grade	MAI	KCF	RCF
General Average	1	-0.27*	-0.36**	-0.29*
MAI	-0.27*	1	0.73**	0.89**
KCF	-0.36**	0.73**	1	0.34**
RCF	-0.29*	0.89**	0.34**	1

N=65 ** Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

There was a negative correlation between the total score of the MAI, regulation of cognition factor, and general average grade at 0.01 level. Negative correlation at 0.05 level was also observed between the general average grade and knowledge of cognition factor. Correlations also exists between total scores of MAI, knowledge of cognition factor, and regulation of cognition factor at 0.01 level. See table 3

Table 4: Correlation between General Average Grade and Metacognitive Awareness Inventory Scores of 2nd year BSE students.

	General Average	MAI	KCF	RCF
General Average	1	-0.42**	-0.20*	-0.38**
MAI	-0.42**	1	0.47**	0.92**
KCF	-0.20*	0.47**	1	0.38**
RCF	-0.38**	0.92**	0.38**	1

N=104 **Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

There was a negative correlation between the total score of the MAI, regulation of cognition factor, and general average grade at 0.01 level and 0.05 level. In the knowledge of cognition factor and regulation of cognition factor, a negative correlation was found at 0.01 level. Correlation also exists between the general average grade and knowledge of cognition factor and regulation of cognition factor at 0.05 level. Negative correlation also exists between total scores of MAI, knowledge of cognition factor, and regulation of cognition factor at 0.01 level. See table 4.

Table 5: Correlations between Metacognitive Awareness Inventory Scores and General Average Grade for 2nd Year BEED.

	General Average Grade	MAI	KCF	RCF
General Average Grade	1	-0.39**	-0.21**	-0.36**
MAI	-0.39**	1	-0.59**	-0.91**
KCF	-0.21**	-0.59**	1	-0.22**
RCF	-0.36**	-0.91**	-0.22**	1

N=169 ** Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

There was a negative correlation between the total score of the MAI, regulation of cognition factor, and knowledge of cognition factor at 0.01 level. In the knowledge of cognition factor and regulation of cognition factor, a correlation was also found between each of these factors at 0.01 level. Negative correlation also exists between the final general average grade and knowledge of cognition factor and regulation of cognition factor at 0.01 level. The same also exists between the total scores of MAI, knowledge of cognition factor, and regulation of cognition factor at 0.01 level. See table 5.

Table 6. T-test for the 2nd BEED students and 2nd year BSE Students on the Metacognitive Awareness Inventory.

	t-value	p-value	Verbal Interpretation
Knowledge of Cognition Factor	0.96661	0.335138	Not Significant
Regulation of Cognition Factor	2.28401	0.02363	Significant
Metacognitive Awareness Total Score	2.32539	0.021254	Significant

Significant Level at $p < 0.05$

To determine if there were differences in scores on the MAI between 2nd Year Bachelor of Elementary Students and 2nd Year Bachelor of Secondary Students, an analysis of variance (ANOVA) was done. There was no significant

difference between the scores of 2nd year BEED students and 2nd year BSE students with regard to their scores on the knowledge of cognition factor. However, a significant difference was found between the scores of 2nd year BEED students and 2nd year BSE students with regards to the regulation of cognition factors $t\text{-value}=2.28, p<0.05$. The mean score on the regulation of cognition factors for 2nd year BSE students was 21.90 and 20.14 for 2nd year BEED students. There was also a significant difference between BEED students and BSE students with regard to the scores on the MAI $t\text{-value} = 2.33, p<0.05$. The mean on the Metacognitive Awareness Inventory for 2nd year BSE students was 31.91 and 29.77 for 2nd year BEED students.

IV. DISCUSSIONS

The study aimed to explore the Metacognitive Awareness Inventory of Schraw and Dennison and its relationship to the General Average Grade (Academic Achievement) of the 2nd Year BEED students and 2nd year BSE students. It revealed a significant negative correlation between the student's General Average Grade and their scores in metacognitive awareness inventory. In this study, since the highest general average grade is 1.00 and the lowest possible general average grade is 5.00, negative correlation implies that the higher the general average grade of students, the higher the metacognitive awareness of students.

Statistical analysis revealed that there is a significant correlation between the final general average grades of 2nd year BEED students to their scores on the metacognitive awareness inventory. There was also a significant correlation between the factors involved in the metacognitive awareness inventory (Knowledge of Cognition and Regulation of Cognition) and the students' general average grades.

Also, for the 2nd year students of BSE; there is a correlation between their general average grades to their scores on the metacognitive awareness inventory. In terms on the knowledge of cognition factor and the regulation of cognition factor, there exists a correlation. The study indicated that an increase in metacognition leads to better performance academically (Nongtodu et al., 2017).

It also revealed that there is a significant difference in the scores on the regulation of cognition factor between the 2nd year BEED students and 2nd year BSE students. This supports the authors contention that the 2nd year BSE students are better in planning, goal setting, and allocating resources prior to learning (Planning), have more skills and strategies used to process information

efficiently (Information Management Strategies), inclined in assessing one's learning or strategy (Comprehension Monitoring), more adept in correcting comprehension and performance errors (Debugging Strategies), and better in analyzing the performance and strategy effectiveness after a learning episode (Evaluation). However, no significant difference was found in terms of the knowledge of cognition factors. This implies that both 2nd-year students of BEED and BSE are able to use critical thinking related to the topic and obtain knowledge through presentations, demonstrations, discussions (Declarative Knowledge), apply knowledge for the purpose of completing a procedure or processor through discovery, cooperative learning, and problem-solving (Procedural Knowledge), and determine specific processes or skills should transfer and apply declarative and procedural knowledge with certain conditions presented (Conditional Knowledge). (Schraw et al., 1994)

The results of this study is important for the entire college of education in NEUST-SIC, given a correlation between the Metacognitive Awareness and Final General Average Grades of 2nd year BSE and BEED students, it can be a basis for college instructor to determine the necessary metacognition skills needed by low performing students. Moreover, universities like NEUST can conduct training relative to the metacognitive skills needed by their students to perform well academically.

V. CONCLUSIONS

1. The level of metacognitive awareness of the 2nd year BEED and BSE students, which is measured by (MAI) is a good indicator of the good level of education in NEUST-SIC.
2. The results of this study emphasize the correlation between the metacognitive awareness and general average grade, it can be an instrument for educators to assess their students in need of instructions on metacognition.
3. The faculty members of NEUST and other universities may use the results of this study to encourage their students to employ metacognitive skills to improve their grades.
4. This study may encourage schools to hold training programs for students on how to use strategies and skills in metacognition. More so, for college students who will be a future educator someday and may be responsible for another generation of learners to come.

VI. RECOMMENDATION

Finally, taking into considerations of the limitations in the present study, the possible suggestions for research on metacognitive awareness of college of education students are proposed:

1. Further studies of metacognition are conducted in different levels of higher studies as well as in different colleges of NEUST.
2. A separate study may also be made to the members of LGBTQ+ and how metacognitive awareness differs from one another.
3. A metacognitive awareness inventory is also recommended to different grade levels, gender and development, as well as age groups. This may involve assessing the relationship of metacognition with other factors like leadership style for students' growth.
4. Research may also be conducted on its relationship to leadership qualities of a person given that most of the students are being trained to become a leader in their own respective fields.
5. Finally, this study shows that metacognition has a direct correlation with academic achievement (Average Final Grade). One may opt to study its correlation with the result to Licensure Examination for Teachers.

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