

CRITICAL THINKING, RETENTION MEMORY SKILLS, AND ACADEMIC PERFORMANCE OF PUBLIC SENIOR HIGH SCHOOL STUDENTS IN THE FIFTH DISTRICT OF CAVITE

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ABSTRACT

A study was conducted to determine students' learning skills that are dominant over the other and its relationship to the academic performance of senior high school students in the 5th district of Cavite: Carmona, Silang and GMA. Correlational research design was used to determine the underlying relationships between and among the critical thinking skills, retention memory skills, and academic performance of the students. Results showed that the critical thinking skills of the students were not suited to their actual grade level. However, retention memory skills of the students were above average implying that the students perform better in this learning skill. These two learning skills also have positive correlation to the academic performance of the students. It implies that the two learning skills help the students to perform better academically. Development of activities and assessment that focus on and help the students to improve their level of critical thinking skills is suggested. Determining the interplay between the two learning skills is likewise recommended.

Keywords: *academic performance, critical thinking skills, retention memory skills, learning skills, 21st century skills*

INTRODUCTION

Updating of an educational system plays a vital role in all countries especially in the Philippines. The current educational system in the Philippines promotes 21st century skills among students to prepare them for life-long learning. It introduces the 4 Cs of 21st century learning skills – the critical thinking skills, creativity, collaboration, and communication (Applied System, 2019). It is the integration of 21st century learning skills to the learning outcomes of the students which may help the students to improve and hone their skills (Handajani, 2018). With this, the Department of Education in the Philippines decided to implement the K-12 curriculum to improve the basic educational system and better match school training with the skills in demand from

industry. Despite having Republic Act No. 10533 or the Enhanced Basic Education Act of 2013, still the quality of basic education in the Philippines remained low based on the recent National Achievement Test (NAT) average scores of Grades 6 and 10 students (BusinessWorld, 2016). With this problem, the Department of Education must ascertain where educational system falls short in order to address the issue of students' NAT average scores that are below average.

According to the study of Al-Shalabi (2015), critical thinking skills help the students to think reasonably, analytically, and objectively. These skills are prerequisite for learning, and the sole recipe for success in the 21st century. Without these skills, learners will not be able to function

well and actively participate in social and political spheres. Having these skills will better enable students to surmount future problems. Moreover, based on the study of Karbalaeei (2010), educators must develop instructional pedagogy with purposeful learning activities to improve the critical thinking skills and dispositions of the students. However, these critical thinking skills were not given attention because in the educational system, learning is usually thought to occur during episodes of studying, whereas retrieval of information on testing simply serves to assess what was learned (Roediger III & Butler, 2011). In addition, retrieval practice promotes the acquisition of knowledge that can be flexibly retrieved and transferred to different contexts. The power of retrieval practice in consolidating memories has important implications for both the study of memory and its application to educational practice. However, some students experience difficulties retrieving information stored in their memory because new knowledge is stored only in their short-term memory. The factor that might have caused this to occur is that students only learn in order to pass examination. Learning is undertaken in order to obtain high exam scores, but they do not continue learning afterwards (Neolaka & Corebina, 2018).

Working memory, or the capacity to temporarily retain and modify knowledge in a "mental workspace," may be a modifiable factor for poor academic performance, according to recent research (Gehan, et. al, 2011). Children who struggle with working memory are more likely to struggle in school. Recent research has shown that adaptive training tasks that promote improvements in working memory capacity can help working memory function better. We will test whether the intervention is both cost-efficient and effective as a targeted preventative strategy for early children at risk of academic issues.

Since the students' NAT scores are so low, educators need to identify methods to support the students in achieving academic excellence. With this, a study was done to ascertain which learning skills would enable students to achieve academic success. According to several studies, critical

thinking skills and retention memory skills are two learning skills that can support a student's academic success. The level of the students' critical thinking skills and retention memory skills was assessed in this study. Also, a positive correlation between students' academic performance and critical thinking skills and retention memory skills was found.

METHODOLOGY

Research Design

Descriptive-correlational design was used to describe the level of critical thinking skills and memory retention skills, and to determine the relationship between and among the academic performance, critical thinking skills and memory retention skills of the students.

Participants of the Study

Krejcie and Morgan's (2012) formula was used to determine the number of participants of the study.

Table 1 shows the senior high schools in CARSIGMA with their corresponding population and number of participants, AY 2018-2019.

Among the 5,180 senior high school students in the three main public schools in the 5th district of Cavite, specifically in Carmona, Silang and General Mariano Alvarez (CARSIGMA), 357 students were randomly selected from the different academic tracks both from Grades 11 and 12 of senior high school during the Academic Year 2018-2019.

Data Gathering Procedure

The researchers obtained permission from the Division Office of Cavite to conduct the survey to the three main public senior high schools at the 5th District of Cavite: Carmona, Silang and General Mariano Alvarez. Parental consent was also secured since the participants were minors. The principals and coordinators of the participating schools set the date of the survey. Before the researchers administered the

Table 1. Senior high schools in CARSIGMA with their corresponding population and number of participants, AY 2018-2019

SCHOOL	POPULATION	NUMBER OF SAMPLES
Angelo Levardo Senior High School, Carmona Cavite		
Grade 11		64
Grade 12	935	46
	664	
Bulihan National High School, Silang Cavite		
Grade 11	522	36
Grade 12	754	52
General Mariano Alvarez Technical High School, GMA Cavite		
Grade 11	1214	84
Grade 12	1091	75
TOTAL	5180	357

questionnaires, pilot-testing was done in other municipalities which were also public senior high schools. Cronbach alpha was used to test the acceptability and reliability of the questionnaires.

After that, the researchers administered the questionnaires to the three main public senior high schools of CARSIGMA based on the date approved by the principals and coordinators. The first set of questionnaires was administered to determine the critical thinking skills of the senior high school students in terms of their inference, assumptions, conclusion, interpretation, and evaluation of arguments. After they finished the first set of questionnaires, the students took 15 minutes break, then the second set of questionnaires was administered to determine the retention memory skills of the students includes recall, recognition, prose memory, and visual reproduction. The students answered

within one and a half hours.

To measure the level of students' critical thinking skills, Table 2 was patterned from the study of Indah and Kusuma (2016) based on the equivalent category level in the Philippines and to measure the level of memory retention skills, Table 3 was patterned from the study of Aspacio (2014).

Statistical Analysis

Pearson r was used as the statistical tool for the interpretation of the results. It was also used to determine the relationship between the academic performance of the students and their critical thinking skills and retention memory skills.

Table 2. Students' level of critical thinking skills

SCORE	CATEGORY	EQUIVALENT CATEGORY
25-30	Elementary	Grades 1-3
31-35	Pre-Intermediate	Grades 4-6
36-40	Intermediate	Junior High School
41-45	Post-Intermediate	Senior High School
46-50	Advanced	College

Table 3. Students' level of memory retention skills

SCORE	INTERPRETATION
Below 20	Very Low
20-29	Low
30-39	Below Average
40-59	Average
60-70	Above Average
71-80	High
Above 80	Very High

Pearson-r VALUE	INTERPRETATION
± 1	Perfect positive/negative correlation
± 0.80 to ± 0.99	Very Strong Positive/Negative Correlation
± 0.60 to ± 0.79	Strong Positive/Negative Correlation
± 0.40 to ± 0.59	Moderate Positive/Negative Correlation
± 0.30 to ± 0.39	Weak Positive/Negative Correlation
± 0.01 to ± 0.29	Very Weak Positive/Negative Correlation
0	No Correlation

Table 4. Students' level of critical thinking skills

SCORE	FREQUENCY	PERCENT-AGE	CATEGORY LEVEL	EQUIVALENT CATEGORY LEVEL
25-30	5	1	Elementary	Grades 1-3
31-35	50	14	Pre-Intermediate	Grades 4-6
36-40	208	58	Intermediate	Junior High School
41-45	70	20	Post-Intermediate	Senior High School
46-50	24	7	Advanced	College
TOTAL	357	100		

RESULTS AND DISCUSSION

Data in Table 4 shows that five (1%) of the students in the three public senior high schools were in the elementary level (Grades 1-3), 50 (14%) were in the pre-intermediate level (Grades 4-6), and 208 (58%) in the Intermediate level (Junior High School). It revealed that 263 (73%) of the students had lower-than-average critical thinking abilities compared to their actual year level. Only 70 (20%) of the students' critical thinking skills were at the post-Intermediate level (Senior High School), which corresponds to their year level, and 24 (7%) of the students had an Advanced Level (College) in terms of their critical thinking skills.

Since the study revealed that students' critical thinking skills were very low, it implies that there is a real issue with how to improve students' critical thinking skills. According to Budsankom (2015), the classroom environment, psychological, and intellectual traits of students have a direct impact on students' higher order thinking abilities. In order to help the students

hone their critical thinking skills, these factors may also need to be taken into consideration. But these are not the only factors that may affect the critical thinking skills of the students, (Andrade & Benedictor, 2022), the results indicated that pre-service instructors still fail with critical thinking, particularly when it comes to assessing arguments and drawing conclusions, therefore they may also be held responsible for the students' lack of critical thinking abilities. Furthermore, the failure of the pre-service teachers demonstrated that students' critical thinking abilities in analyzing arguments and making conclusions are insufficient.

Table 5 shows the data that was gathered based on the students' retention memory test results. Twenty-four (7%) students in the three public senior high schools had below average level and it revealed that only few of them had lower-than the level in terms of retention memory skills. This means that the majority of the students are good in memory retention skills.

Table 5. Students' level of memory retention skills

SCORE	FREQUENCY	PERCENTAGE	INTERPRETATION
Below 20	0	0	Very Low
20-29	0	0	Low
30-39	24	7	Below Average
40-59	124	35	Average
60-70	176	49	Above Average
71-80	15	4	High
Above 80	18	5	Very High
TOTAL	357	100	

According to Pillado et al. (2020), the extent of students' perception on factors contributory to memory retention is "high" in terms of motivational practices and experiences, goal setting and accomplishments, and personalized learning, while they perceive the use of teaching strategies and learning activities and the utilization of educational resources and learning devices to be "very high". In addition, in the study of Steffens et al. (2015), performed actions appear to be remembered particularly well, and better than observed actions because in recognition memory, an enactment effect has regularly been observed while in free recall it depends on the experimental design. But, when performed and observed actions were intermixed, an enactment effect was typically found.

Data in Table 6 shows that there was a weak positive correlation between the variables which means that there is a directly proportional effect to the academic performance of the students. This implies that while the level of critical thinking skills of the students improves, the academic performance of the students will also be improved (D'Allesio, et.al, 2019). Hence, there is a weak positive correlation between the variables which means that there is a directly proportional effect to the academic performance of the students. It further means that while the level of critical thinking skills of the students improves, the academic performance of the students will also be improved (D'Allesio, et al., 2019).

Since learning outcomes are a reflection of students' skills, including their cognitive capacities, critical thinking skills have an impact

on how well students learn (cognitive domain). The cognitive domain is associated to intellectual or logical aspects. It addresses the following topics: 1) knowledge, which includes experience and knowledge retained in memory; 2) comprehension; 3) application; 4) analysis; 5) synthesis; and 6) evaluation. The first and second elements were to be the main emphasis. Understanding, on the other hand, refers to conceptual understanding or a thought process (critical thinking), which includes analysis, synthesis, problem recognition and solving, conclusions, and assessments. The first (knowledge) includes memory, and the second (understanding) refers to the concepts, Nur'azizha et al. (2021).

Hence, students that possess critical thinking abilities can offer straightforward explanations, develop fundamental skills, draw conclusions, offer more explanations, think carefully and completely to make the right selections, and make proportionate assessments or decisions to deal with the issue. To choose or complete the answer correctly on a test, as an illustration, requires significant and in-depth thought. Furthermore, accuracy is required because students still frequently fail to check their responses after finishing a question. The necessity for critical thinking skills stems from the fact that when students possess these abilities, they can make thoughtful judgments and provide thoughtful solutions to challenging problems.

Data in Table 7 shows that there is a positive correlation between the variables which means that there is a directly proportional effect to the academic performance of the students. It means

Table 6. Relationship between academic performance and critical thinking skills of the participants

VARIABLE	AVERAGE SCORES	PEARSON-r VALUE	INTERPRETATION	P-VALUE	DECISION
Academic Performance	89.27	0.295	Weak Positive	0.000	Significant
Critical Thinking Skills	37.00				

that while the level of retention memory skills of the students improves, the academic performance of the students will also be improved (Hassevoort et.al, 2018). In addition, it affirms the findings of Valentina et al. (2020) which indicate that most students have high and medium memory properties, thus, having a positive correlation with the academic performance of the students. This implies that the high values of memory properties correspond to high values of academic performance of the students. Also, the result showed that there is a significant correlation between properties of memory and academic performance of the students. This supports the result that there is also a significant relationship between the students' academic performance and their level of retention memory skills.

Similarly, Al-Momani et al. (2022) concluded that students, in general, possess a high level of learning skills, recall and academic achievement, in addition to the existence of a direct relationship

between learning, recall and academic achievement. This was supported by their finding that there were significant differences in the skills of learning, memorization and academic achievement of the students.

CONCLUSIONS

Based on the findings, majority of the students have low level critical thinking skills compared to their retention memory skills which is above average.

Additionally, critical thinking skills and retention memory skills have a positive effect on their academic performance. Each learning skill may help the students to perform better in their academic performance.

Table 7. Relationship between academic performance and retention memory skills of the participants

VARIABLE	AVERAGE SCORES	PEARSON-r VALUE	INTERPRETATION	P-VALUE	DECISION
Academic Performance	89.27	0.491	Moderately Positive	0.000	Significant
Retention Memory Skills	68.00				

RECOMMENDATIONS

Teachers or educators may focus on the activities or assessment that may help students to improve their critical thinking skills. They may continue enhancing the retention memory skills of the students since this may help the students to perform better on their academics.

Future studies that determine the significant difference of the two learning skills and on how these two learning skills may interplay with each other

may be considered.

Determining if the students' demographic profile such as age, sex, and family status has effects on the learning skills of the students may also be pursued.

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