

# Student Performance in Social Studies with Computer-Assisted Instruction During Pandemic in Secondary School of Zambales, Philippines

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**Abstract**— This study aimed to assess the performance in Social Studies with computer-assisted instruction during the pandemic among secondary students of Zambales, Philippines. This study used the quasi-experimental research design, which utilized both qualitative and quantitative techniques and used of a non-randomized pre-test, post-test and questionnaire that identified the students' perception about CAI supplement used by the researcher as the tools in gathering data from 180 students from Grade 9 classes in a selected school in San Marcelino, Zambales, Philippines. The study indicates that most student respondents are female, young teens. The students performed very satisfactory during the 2nd Quarter. The students were rated very satisfactory in their academic performance with the use of CAI during 3rd Quarter. There was a notable increase from did not meet expectations to very satisfactory academic performance of students in Social Studies in Pre-test and Post-test. There is significant difference on the academic performance of students with and without Computer Assisted Instruction (CAI). The students agreed on the usage of CAI in Social Studies. Based on the summary of the study conducted and the conclusions arrived at, the researcher offers the use of CAI in teaching Social Studies, education stakeholders may provide computers and other digital infrastructures in schools to better implementation, curriculum planners may consider curriculum review of Social Studies in secondary schools to incorporate the CAI in teaching, contextualization of CAI, teachers may consider CAI in the classroom thru blended learning and conduct of similar study during an educational disruption may be considered.

**Keywords**— Performance in Social Studies with computer-assisted instruction, contextualization of CAI, post-test, pre-test, and digital infrastructures.

## 1. INTRODUCTION

Even before the Pandemic, the Department of Education encouraged the use of ICT, or information and communication technology. Appropriate use of ICT has been shown to contribute to the agency's thrust and direction in carrying out its vision, mission, and goals in an effective and efficient manner. The Department of Education stated in DepEd Order No. 76 series 2010, Policy Guidelines on the Implementation of the 2010 Secondary Education Curriculum (SEC), that the use of ICT as an integral part of the curriculum will be pursued in schools where technologies are already available. Technology aids the Department of Education in the strengthening of information systems, the improvement of technology infrastructure, the improvement of teaching and learning, and the improvement of communication and engagement.

As a learning institution, technology was critical in helping students reach their full potential. Teachers can now supplement their lessons with PowerPoint and video presentations. This allows students to visualize the subject matter, which helps them understand it better.

Technology has taken into account the variety of learners, particularly those who are visual and auditory. The effective use of digital learning tools in the classroom can boost student engagement, assist teachers in improving lesson plans, and enable personalized learning. It also assists students in developing critical 21st-century skills (Home, O., S., Teaching, O., Leadership, O., Leadership, O., & Aid, T. et al). (2022). Teachers must address the individuality of each student. Educators must maximize the benefits that ICT integration can provide.

Technology is now used in education to present knowledge to students as well as to assess their academic progress. Various computer-assisted instruction programs have been developed to provide students with meaningful and enjoyable activities that can influence their performance. We can provide instructions in various formats, such as a PowerPoint presentation, and allow them to visualize the lesson by providing videos. In our current situation, where face-to-face education has been suspended to limit the spread of the COVID-19 virus, different learning modalities

have been used to continue education. When the paper and pencil test and face-to-face assessment are discontinued, computer-assisted education (CAI) will be of great assistance in assessing students' learning outcomes. Closure of educational institutions across the country to

In the study that compared academic performance of college students who were exposed to traditional methodology with those of college students who received traditional methodology supplemented with computer-assisted instruction (CAI). From the 26 conclusions, an overall mean effect size of 0.127 was calculated, indicating that, on the average, college-level students receiving traditional instruction supplemented with CAI attained higher academic achievement than did 55% of those receiving only traditional instruction. Based on the study of Marlex M. Estrella Impact of Using Computer-aided Instruction (CAI) in the Performance of Grade 8 Students in Social Studies teaching using computer aided-instruction resulted with favorable impact in the students' performance in Social Studies.

Using CAI, lesson delivery can take many forms that will motivate students to learn; motivating students using computer technology is one strategy that is frequently used in education. CAI transforms learning into a pleasurable experience. CAI requires a very encouraging response from the children through its computer-aided lessons. They enjoy clicking on the course and seeing pictorial representations, and they value this type of fun learning method. Accessories such as a pressure pad, which records commands when gently pressed, and voice - sensitive and light - sensitive devices provide them with joy and fantasy. CAI makes classroom learning engaging and effective, self-learning simple and effective, and lifelong learning accessible to all. CAI has enormous potential for improving the teaching and learning processes.

This study focused on collecting data based on pre-test and post-test of the student performance in Social Studies both from conventional teaching technique and with Computer Assisted Instruction from Grade 9 secondary students. The study also assessed their perceptions on the utilization of the computer-assisted instruction in learning Social Studies in their grade level and school based on Functionality. The student-respondents strongly agreed on the functionality usage of the Computer Assisted Instruction (CAI) in Araling

Panlipunan based on functionality, accessibility, technical, and social and cognitive presence.

### **Objectives of the Study**

The study aimed to assess the student performance in Social Studies with Computer Assisted Instruction at selected school in San Marcelino, Zambales, Philippines.

Specifically, this study seeks to find answer to the following questions:

1. What is the student profile be described in terms of:
  - 1.1 Age;
  - 1.2 Sex;
2. What is the academic performance of Grade 9 students during 2nd Quarter?
3. What is the academic performance of Grade 9 students with Computer Assisted Instruction (CAI)?
4. What is the academic performance of Grade 9 students in Social Studies in Pre-Test and Post Test?
5. Is there a significant difference between academic performance of students with and without CAI?
6. How do students describe CAI in terms of functionality, accessibility, technical and social and cognitive presence?

## **2. METHODOLOGY**

The researcher used a quasi-experimental research design, which is both qualitative and quantitative in nature, to collect data that best compare and analyze the results before and after the application of intervention or treatment among respondents during the experiment, as well as their perceptions of the use of computer-assisted instruction in Social Studies.

The participants of the study were the one hundred eighty (180) student-respondents from a particular secondary school in San Marcelino, Division of Zambales, Region 3, Philippines.

### **Locale of the Study:**

This research was carried out at a selected secondary school in San Marcelino, Zambales. Zambales is a province in the central Philippine island of Luzon. It is one of seven (7) provinces in Central Luzon, or Region III, and has a total land area of 3,830.8 km<sup>2</sup>. Zambal, Tagalog, and Ilocano are the most widely spoken dialects. Iba is the capital city. It is located in the eastern part of the island of Luzon. The province of Zambales is



divided into 13 municipalities. Botolan, Cabangan, Candelaria, Castillejos, Iba, Masinloc, Olongapo City, Palauig, San Antonio, San Felipe, San Marcelino, San Narciso, and Sta. Cruz, as well as Subic. These municipalities or towns have schools that are a mix of rural, suburban, and urban institutions.

The pre-test and post-test, as well as the interventions used (computer-assisted instruction in Social Studies) and the assessment, were given to students in a selected secondary school in San Marcelino, Zambales, during the second and third quarters of the pandemic school year 2021-2022.

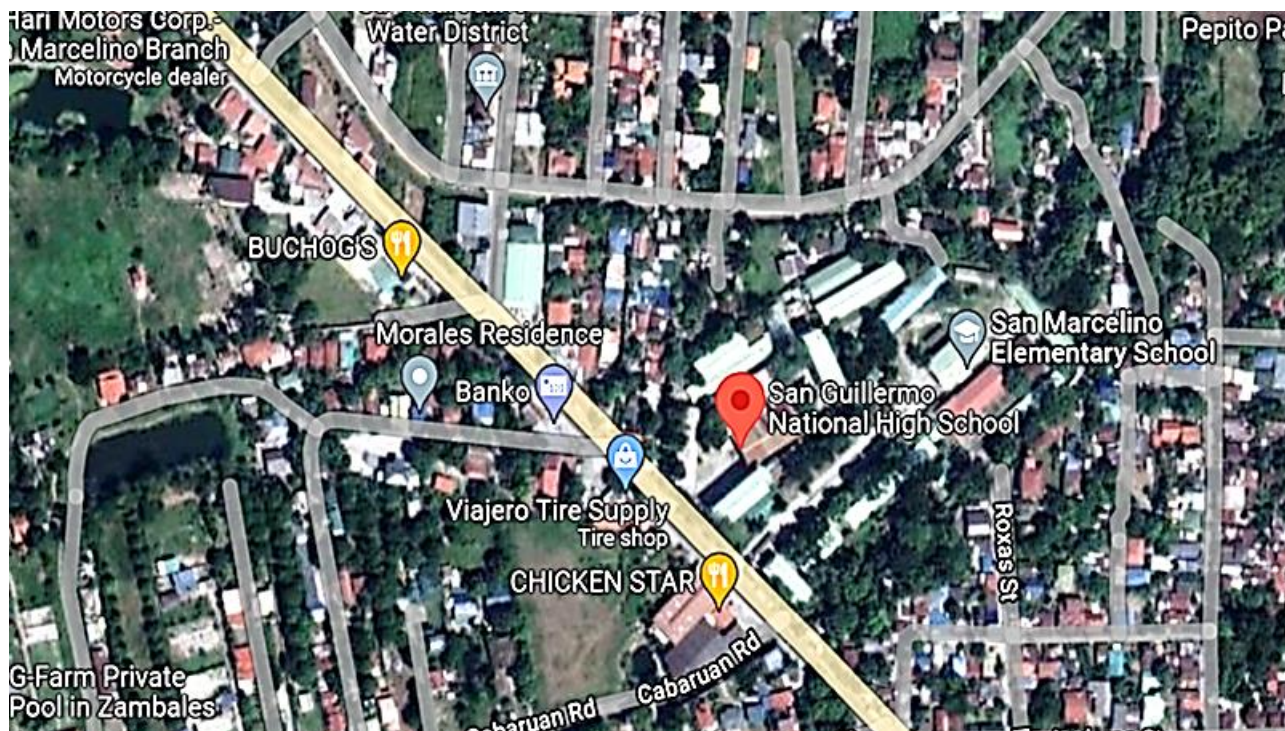


Figure 1: Map of Zambales

The pre-test and post-test, as well as the interventions used (computer-assisted instruction in Social Studies) and the assessment, were given to students in a selected secondary school in San Marcelino, Zambales, during the second and third quarters of the pandemic school year 2021-2022. This selections of respondents are according to the total number of enrolled students in six sections in Grade 9 level.

The study was conducted at selected secondary school in San Marcelino, Zambales.

### 3. RESULTS AND DISCUSSIONS

#### *Academic Performance of Grade 9 Students during 2nd Quarter:*

Table 1 presents the frequency and percentage distribution on the academic performance of Grade 9 students during the 2nd quarter. During the second quarter, the majority of student-respondents (156/106) received a "Satisfactory" score range of 80-84. During

the second quarter, the average academic performance of grade 9 students was 85 percent, which falls within the 85-89 range interpreted as "Very Satisfactory." Very satisfactory academic performance indicates a good grasp of the subject matter in one area balanced by a satisfactory grasp of the subject matter in the other.

For so long, academic performance evaluation has been a part of traditional teaching practices that many people, both educators and students, do not question its usefulness or validity. Academic performance is commonly used and expected in the educational system to assess teachers' and schools' success or failure, to mark proficiency, progress, and effort, to compare pedagogies and teaching methods, and to assess the success or failure of teachers and schools (Brilleslyper, Ghrist, Holcomb, Schaubroeck, Warner, & Williams, 2012). Academic performance is used to assess the success or failure of pedagogies and teaching methods, as well as to measure proficiency, progress, and effort.

**Table 1: Frequency and Percentage Distribution on the Academic Performance of Grade 9 Students during 2nd Quarter**

Descriptive Equivalent	Score Range	2nd Quarter Academic Performance	
		Frequency (f)	Percentage (%)
Outstanding	90-100	23	12.80
Very Satisfactory	85-89	46	25.60
Satisfactory	80-84	106	58.90
Fairly Satisfactory	75-79	5	2.80
Did Not Meet Expectations	Below 75	0	0.00
Total		180	100.00
Mean		84.80 or 85	
Interpretation		Very Satisfactory	

### **Academic Performance of Grade 9 Students with Computer Assisted Instruction (CAI) during 3rd Quarter**

The frequency and percentage distribution on the academic performance of Grade 9 students with CAI during the 3rd quarter is shown in Table 2.

**Table 2: Frequency and Percentage Distribution on the Academic Performance of Grade 9 Students with CAI during 3rd Quarter**

Descriptive Equivalent	Score Range	3rd Quarter Academic Performance	
		Frequency (f)	Percentage (%)
Outstanding	90-100	42	23.30
Very Satisfactory	85-89	86	47.80
Satisfactory	80-84	47	26.10
Fairly Satisfactory	75-79	2	1.10
Did Not Meet Expectations	Below 75	3	1.70
Total		180	100.00
Mean		87.20 or 87	
Interpretation		Very Satisfactory	

It should be noted that the greatest number of student-respondents (86), or 47.80 percent, recorded a score range of 85-89 with the qualitative equivalent of "Very Satisfactory."

During the third quarter, the mean academic performance of grade 9 students receiving Computer Assisted Instruction (CAI) was 87.20, or 87 percent described as "Very Satisfactory."

The very satisfactory assessment of learning with the use of CAI during the third quarter is based on the salient feature of CAI in improving students' knowledge by providing simulated real-life problems, which is mirrored in their very satisfactory third-grade academic performance.

CAI is a pedagogical strategy for delivering content to an individual or group of learners that makes use of computers and other digital infrastructures.

CAI provides students with a personalized, engaging, flexible, and adaptive learning experience. CAI can help students improve their motivation and academic performance.

CAI is also a combination of self-learning principles and computer technology that students can use at their own pace (Kaleli, 2020).

### **Academic Performance of Grade 9 Students in Social Studies in Pre-test and Post-test**

The frequency and percentage distribution on the academic performance of Grade 9 students in Social Studies in Pre-test and Post-test is presented in Table 3.

**Table 3: Frequency and Percentage Distribution on the Academic Performance of Grade 9 Students in Social Studies in Pre-test and Post-test**

Descriptive Equivalent	Score Range	Pre-test		Post-test	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Outstanding	19-20	1	0.60	51	28.30
Very Satisfactory	17-18	0	0.00	36	20.00
Satisfactory	15-16	16	8.90	70	38.90
Fairly Satisfactory	13-14	8	4.40	5	2.80
Did Not Meet Expectations	12 & Below	155	86.10	18	10.00
Total		180	100.00	180	100.00
Mean		11.99 or 12		16.58 or 17	
Interpretation		Did Not Meet Expectations		Very Satisfactory	

During the Pre-test, the majority of students (155 out of 180) or 86.10 percent had a score range of 12 and below, which was interpreted as "Did Not Meet Expectations." The mean academic performance of Grade 9 students in Social Studies in Pre-test was 11.99 or 12, which falls within the score range of 12 and below, interpreted as "Did Not Meet Expectations."

During the post-test, the majority of students (70 out of 180) or 38.90 percent scored 15-16 with a qualitative interpretation of "Satisfactory." The mean academic performance of Grade 9 students in Social Studies in the post-test was 16.58 or 17, which falls within the 17-18 score range, which is interpreted as "Very Satisfactory." The academic performance of Grade 9 students improved by 4.59 percent (38.28 percent) when the

Post-test results were compared to the Pre-test results. The increase in post-test scores indicates a good understanding of the subject matter, with a balanced very satisfactory understanding of other subjects. The significant increase in post-test academic performance is attributed to the effectiveness of CAI in acquiring learning among students, as evidenced by the increase in post-test academic performance.

In general, the use of the teaching strategy increased students' motivation toward SS. It implies that CAI had a significant impact on increasing students' motivation for SS. This is consistent with previous research on the effectiveness of CAI in increasing student motivation (Adara & Haqiyah, 2021)

## Test of Difference on the Academic Performance of Students with and without Computer Assisted Instruction (CAI)

**Table 4: Shows the t-test in testing the difference on the academic performance of student with and without CAI.**

	Group	N	Mean	Std. Deviation	Std. Error Mean
Academic Performance	With CAI	90	3.98	0.82077	0.08652
	Without CAI	90	3.44	0.67226	0.07086

t-test for Equality of Means						
t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
<b>4.769</b>	178	0.000	0.53333	0.11183	0.31264	0.75402
<b>Decision: Reject Ho (Significant)</b>						

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The results are similar to the findings of previous studies that CAI has a significant impact on the students' academic achievement (Kaye & Ehren, 2021).

### **Summary: Assessment on the Use of Computer Assisted Instruction (CAI) in Social Studies**

The summary assessment on the use of CAI in Social Studies is presented in Table 5.

It can be noted that students strongly agreed on the use of Computer Assisted Instruction (CAI) in terms of its "Technicality", as manifested with the highest overall weighted mean of 3.37. The grand mean of responses of students on CAI usage was 3.22, with qualitative interpretation of "Agree". The result manifests that the availability and accessibility of computer application for the implementation of CAI is evident.

**Table 5: Summary Assessment on the Use of Computer Assisted Instruction (CAI) in Araling Panlipunan**

Dimensions		Overall Weighted Mean	Descriptive Equivalent
1	Functionality	3.34	Strongly Agree
2	Accessibility	3.02	Agree
3	Technical	3.37	Strongly Agree
4	Social and Cognitive	3.15	Agree
Grand Mean		3.22	Agree

Many studies show that using CAI as a teaching tool greatly aids students in acquiring knowledge. With its intuitive, interactive, and appealing features, CAI becomes an excellent tool for students to learn while having fun. A good CAI software must be error-free and have a quick response time. CAI developers must pay close attention to the software's response time and graphical user interface. Also, portability must be considered in order for students to be flexible in their study routine, reducing the impatience and boredom these students experience when studying for longer periods of time (Maturan, 2019).

### **4. CONCLUSIONS**

The majority of student-respondents are female young teens. The students performed very satisfactorily during the 2nd Quarter. The students were rated very satisfactory in their academic performance with the use of CAI during 3rd Quarter. There was a notable increase from did not meet expectations to very satisfactory academic performance of students in Social Studies in Pre-test and Post-test. There was significant difference on the academic performance of students with and without Computer Assisted Instruction (CAI).

The students agreed on the usage of CAI in Social Studies.

### **5. RECOMMENDATIONS**

In view of the conclusions of the study, the following are recommended.

1. It is encouraged to apply CAI in Social Studies.

2. Leaders of the local government, corporate organizations, and other education stakeholders may fund computers and other digital infrastructures in schools to more effectively implement the approach because CAI improved students' academic achievement.
3. Curriculum planners may consider incorporating CAI in the curriculum review of Social Studies in secondary schools.
4. In this disruptive technological and disruptive educational environment, contextualization of CAI is also advised.
5. Teachers may also think about converting their traditional use of CAI to the modern blended learning modalities, which include both online synchronous and asynchronous learning, given the present new normal.
6. The proposed intervention strategy may be adopted by DepEd for review and execution.

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