



# EFFECT OF INTERACTIVE GAME-BASED INSTRUCTION ON THE PERFORMANCE OF JUNIOR HIGH SCHOOL LEARNERS IN SOCIAL SCIENCE

**Madelyn Glecel B. ADA<sup>1</sup>, Donna Mae M. Lopido<sup>2</sup>, Helen C. Fuentes, PhD<sup>3</sup>**

<sup>1</sup>MAED Student, Graduate School, Eastern Samar State University-Borongan Main Campus

<sup>2</sup>MAED Student, Graduate School, Eastern Samar State University-Borongan Main Campus

MAED Professor, Graduate School, Eastern Samar State University-Borongan Main Campus

## ABSTRACT

This research focused on the effect of interactive game-based instruction on the performance of Junior High School learners in Social Science was conducted among Grade 10 learners in Nena National High School, Nena, San Julian, Eastern Samar, for school year 2024-2025, using quasi experimental research design. It can be noted that data were extracted from the participants using a researcher-made instrument after being validated. Furthermore, data were analyzed using mean and standard deviation to describe pretest and post-test results; while, Normalized Learning Gain by Hake (1999) was employed to categorize learning gains. In testing the significant difference between the pretest and post-test result, paired sample t-test was utilized; however, independent-sample t-test was employed to investigate the difference between the learning gains of both groups. The Findings revealed that the Grade 10 students had a very satisfactory pretest mean scores in Social Science. Meanwhile, the post-test mean score of the control group was very satisfactory, on the other hand, there was an outstanding post-test mean score of the experimental group. In addition, the learning gain of the control group was "effective enough", contrarily, the experimental group exhibited an "effective" learning gain. It can also be noted that there was a significant difference between the pretest and post-test mean score in Social Science of both control and experimental groups. Lastly, it was found out that the learning gains between the two groups was significantly difference, highlighting the evident effectiveness of interactive game-based instruction on improving the learning performance in Social Science.

**KEYWORDS:** Interactive Game-Based Instruction, Performance In Social Science, Grade 10 Students, Quasi-Experimental Research

## INTRODUCTION

One of the most typically utilized trends of teaching strategies in the 21st century is game-based learning approach (Ahmad & Iksan, 2021). There had been a significantly growing body of research on this topic (Zou, 2020), as a method of teaching that enhances efficiency in learning, that is implemented in a form of student-centered learning activities, causing a balance between traditional classroom instruction and educational games (Lasut & Bawengan, 2020). Since students have the natural instinct to have interest in playing games, they are indirectly inclined to pay attention to the teachers' most inventive and engaging teaching strategies. According to Liu (2021), games that are safe to use for educational context must have the ability to promote love of learning, a particular sense of convenience in hurdling a range of challenges, and the characteristic to solve the obstacles with patience, emphasis, and self-assurance, which are crucial towards higher education in developing lifelong learners. Many types of games, including the strategies and mechanics which are required in them, are used in interactive game-based instruction, which promotes a kind of environment that supports that child shall be the focus of the discussion of the lesson (Dadure et al., 2021). Results from the quantitative analysis of the data made in the study by Vargianitti & Karpouzis (2019) indicated that the students' performance improved substantially after the implementation of interactive game-based instruction. It can be noted from the findings of the study conducted by Cayang (2024), that the

implementation interactive game-based instruction is highly effective in improving the students' performance in Mathematics, which resulted to a noteworthy enhancement of learners' performance academically, compared to traditional teaching methods.

However, despite the positive impact of interactive game-based instruction on improving students' performance, a number of obstacles in its implementation cannot be denied as there are cases that students commonly experience negative effect especially when teachers encounter problems as they implement this type of strategy such as insufficiency of time and resources which are essential in searching studying, and instructing games that are educationally appropriate (Jaaska & Aaltonen, 2022). From the same perspective, students could have the tendency to be bombarded with more stress in terms of how their performance while in the game will be scored, considering the pressure from peers and uneasiness due to the competition, and comparison of game results. In addition, Hu and Sperling (2022) expounded teachers tend to stop using educational games if their teaching time is not only limited, but also when the content does meet educational requirements. Meanwhile Kaimara et al. (2021) asserted that both policy and curriculum constitute to the gap in the implementation of game-based learning, where there is discrepancy between the design of the curriculum and structure of educational policies and the nature of games which are used for educational purposes.



## Objectives

1. To determine the difference in the pretest and post-test performance of learners in Social Science when taught using interactive game-based instruction and conventional teaching methods.
2. To assess the extent of learning gains among learners exposed to interactive game-based instruction compared to those taught through traditional instruction.
3. To evaluate the effectiveness of interactive game-based instruction in improving the academic performance of Junior High School learners in Social Science.

## METHODOLOGY

The design that was used in the study was quasi-experimental design, which intended to investigate the effect of interactive game-based instruction on the performance of Grade 10 students in Social Science. Quasi experimental research design is a type of quantitative design that is commonly employed in social sciences, education, healthcare, and other fields, which primarily tests the effect of an intervention or treatment. Unlike experimental designs, quasi-experiments do not engage in random assignment, which fails to have control over external factors that could offer valuable insights into the cause-and-effect relationships between variables. In addition, this was deemed appropriate for the study as it purposively determined the effectiveness of the intervention by comparing the results of the treatment group and the control group who were not equal in number. There were phases which were meticulously undertaken in the study, which comprised planning, designing, implementation, interpretation, and reporting to ensure objective collection and analysis of data extracted from the participants.

### Sampling Design

Stratified purposive sampling was used in this study, a sample of 90 students, divided equally over two sections. 2 had 90-85 grade, 4 in the range 84-80, 12 between 79-75 and 12 between 74-70 grades. This stratification is carried out based on social science first quarter final grades.

### Statistical Design

The data were analyzed using inferential statistics to determine whether significant differences existed between the experimental group (students exposed to interactive game-based instruction) and the control group (students taught through conventional teaching methods). The analysis was conducted using a statistical software package such as JASP (Jeffreys's Amazing Statistics Program).

A pre-test was administered to both groups prior to the intervention to measure their initial knowledge in Social Science. After the instructional sessions, a post-test was administered to assess students' learning gains. To compare the mean scores of the two groups, the study employed the t-test, specifically:

Paired Samples t-test to determine if there was a significant difference between the pre-test and post-test scores within each group, and Independent Samples t-test to determine if there was a significant difference in the post-test performances between the experimental and control groups.

These statistical techniques allowed the researcher to evaluate the effectiveness of the interactive game-based instruction and to determine whether the improvement in student performance differed significantly from that of the traditional teaching method.

### Geographical Area

The study transpired among Grade 10 learners in Nena National High School, Nena, San Julian, Eastern Samar, for School Year, 2024-2025. The said school is one of the prime-movers in education of San Julian District, located at the northernmost part of the municipality, which has a unique curricular offering in TVL strand, which is Carpentry and Shielded Metal Arc Welding (SMAW), compared to the other two public secondary schools in the district. It has a curriculum which is Special Program in Technical-Vocational Education (SPTVE).

## RESULTS

### I. Pretest Mean Score of the Control and Experimental Groups

Table 1 highlights about the pretest mean score of both control and experimental groups in the study. It is emphasized that the control group made a very satisfactory mean score in the said learning area, which is specifically 31.28, with the standard deviation equal to 0.87. Meanwhile, the pretest mean score of the experimental group which is 32.49, coupled with the standard deviation, 0.68, is slightly higher than the mean score of the control group at 1.21, however still categorized as very satisfactory.

This denotes that even before the conduct of the intervention, the Grade 10 learners had already performed exemplarily in the subject, as results emphasized of their very satisfactory mean scores. However, it is worthy to note that the small values of the standard deviation were suggestive that both groups' scores were not significantly dispersed or variable, or their scores were generally close to the average.

Similarly, the study by Masicampo (2023), revealed similar performance in Araling Panlipunan of Grade 10 students of Baganian National High School in Zamboanga del Sur, which ranged from 86 to 96% interpreted as close approximating mastery, across all quizzes, performance tasks, and quarterly assessments.

### II. Post-test Mean Score of the Control and Experimental Groups

It can understand from the table that the post-test mean score in Social Science of the control group which is equal to 36.45, with a corresponding standard deviation which is 0.77, is apparently lower than the post-test mean score of the experimental group which is 48.94, having the standard deviation value that is 0.88.

This reveals that there is already an evident difference between the post-test mean scores of the two groups, for the reason that their scores at the second episode of the test after the conduct of interactive game-based instruction, did not fall under the same categories, where the control group's post-test results remained at "very satisfactory, while the experimental group's performance had soared to "outstanding" level.



The study by Rebato (2024), which considered Grade 11 learners of Oras National High School, Oras, Eastern Samar, had similar study outcome. It indicated that there had been an immensely significant increase of the students' creative writing skills when they were exposed to the intervention or treatment which was also the use of interactive game-based instruction, considering that before the experimental group were taught with the said strategy, they just had a 'good' creative skills, however, after they were taught with the aid of interactive game-based instruction, their skills in creative writing increased to 'very good' category.

### III. Learning Gains of the Control Group and Experimental Group

The data emphasizes the learning gains made by both control and experimental groups. It can be noted that the control group obtained 31.28 pretest mean score, however, during their post-test, they got 36.45 mean score, leading to 5.17 learning gain, which can be further understood through its normalized learning gain equivalent which is 67.73%. The aforementioned result is interpreted as "effective enough".

On the other hand, the pretest mean score of the experimental group (32.49%) is almost equal to the mean score of the control class. Contrarily, with their post-test mean score, which is 48.94, it was evident that the said result was significantly higher than what the other group had obtained, as they garnered an overall learning gain equal to 16.45 tantamount to 81.43% normalized learning gain, which is categorized as "effective" learning gain.

This kind of outcome based on the analysis of the learning gains made by both control and experimental groups is indicative that if the normalized learning gain is equal or lesser than 76%, it is under "effective enough" category (Hake, 1999), which denotes that the treatment implemented is not substantially effective as it did not cause a significant increase in the participants' performance in Social, which can be attributed to the fact that interactive game-based instruction was not utilized by the teacher in teaching them Social Science subject. On the other hand, since the experimental group was exposed to the said intervention, it can be deduced from their learning gains that the use of interactive game-based instruction was essentially effective in improving their Social Science performance.

### IV. Learning Difference Between the Pretest and Post-Test Mean Scores of Control and Experimental Groups

Paired t-test was employed to test the significant difference between the pretest mean score of both control and experimental groups, in accordance with the null hypothesis initially stated which declares that there was no significant difference between the pretest mean scores in Social Science of both groups. However, after the test was made, it was found out that there was indeed no significant difference between the pretest mean scores in Social Science of both control and experimental groups, considering the mean difference that is 1.21, coupled with the value of standard deviation equal to 0.78, and more importantly the result of the t-statistics which is .044, duly supported by .824 significance level. Thus, the investigation evidently failed to reject the null hypothesis.

In the same manner, the test was also run to prove the initially formulated hypothesis which stated that there was no significant difference between the post-test mean scores in Social Science of both control and experimental groups. It was eventually disclosed after the test, in consideration with the following results, where there was 11.4 mean difference, 0.83 standard deviation, 7.05 t-statistics value, and .001 significance level, that there was an obvious significant difference between the post-test mean score in Social Science of both control and experimental groups.

The study by Rebato (2024), can prove that interactive game-based instruction is an effective teaching pedagogy which had improved significantly the creative writing skills of the Grade 11 learners of Oras National High School, based on the findings relative to the post-test mean scores of the experimental group which was essentially higher than the post-test mean score of the control group.

It is suggestive that the writing skills of the students who were exposed to the aforementioned intervention had increased, while the writing skills of those who did not undergo the treatment process, did not necessarily improve.

This finding generally implies that in order for learners to achieve progress in their basic skills, teachers must consider incorporating interactive game-based instruction in their habitual teaching practices.

### V. Difference between the Learning Gains of Both Control Group and Experimental Groups

To test the significant difference between the learning gains in the students' performance in Social Science, the research employed independent-sample t test, specifically in testing the hypothesis which indicated that there was no significant difference between the said learning gains. However, it was worth-noting that the investigation emphatically rejected the predetermined speculation, for the reason that the results stated in table 5, which includes the following values: mean difference 11.28, standard deviation .06, t-statistics 6.83, and significance level .001, underscored that indeed there is significant difference between the learning gains in Social Science of both control and experimental groups, thereby purposefully rejecting the null hypothesis.

The result implies that the learning gain of the control group which is 67.73%) is substantially different from in comparison with the learning gain recorded for the experimental class (81.43), as the former is described as "effective enough", while the latter was interpreted as "effective, evidently belonging to different categories.

Similarly, there had been difference between the learning gains of both groups, particularly because one of the groups were exposed to the intervention, while the other was not, causing to an undeniably unequal results in terms of their performance in Social Science.

**Suggestions**

1. Improve performance in Social Science. Social Science teachers should incorporate effective pedagogical practices to still enhance the performance of some learners in Social Science, where interactive game-based instruction can be an effective strategy that can increase their achievement in the said learning area.
2. Expedite learners' performance in Social Science with the use of interactive game-based instruction. Performance in Social Science as a fundamental skill in the junior high school should be given importance to develop students' knowledge and skills relative to current events, history, economics, geography, etc.
3. Encourage all teachers to adapt the utilization of interactive game-based instruction in their daily classroom activities to support the strict implementation of projects and programs intended for development of Social Science performance.
4. Incorporate interactive game-based instruction in developing higher-order thinking skills.

5. For future study, researchers should consider or give attention to other learning areas where using interactive game-based instruction can be useful for.

**Conclusions**

1. The pretest mean scores in Social Science of both control and experimental groups is very satisfactory.
2. The post-test mean score in Social Science of the control group is very satisfactory, while the pretest mean score in Social Science of the experimental group is outstanding.
3. The learning gain in Social Science of the control group is effective enough. On the other hand, the learning gain in Social Science of the experimental group is effective.
4. There is no significant difference between the pretest mean scores in Social Science of both control and experimental groups. Whereas, there is a significant difference between the post-test mean scores in Social Science of both control and experimental groups.
5. There is a significant difference between the learning gains of both control and experimental groups.

**FIGURE AND TABLES**

Figure 1

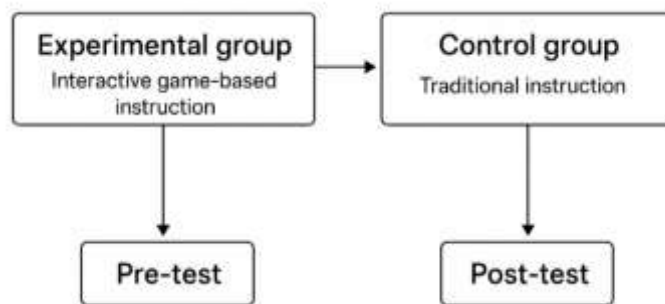


Figure 1. Quasi-experimental research design showing the pre-test and post-test structure for the experimental group exposed to interactive game-based instruction and the control group taught through traditional methods.

**Table 1. Pretest Mean Score of the Control and Experimental Groups**

Groups	Mean Score	SD	Interpretation
Control	31.28	0.87	Very Satisfactory
Experimental	32.49	0.68	Very Satisfactory

**Table 2. Post-test Mean Score of the Control and Experimental Groups**

Groups	Mean Score	SD	Interpretation
Control	36.45	0.77	Very Satisfactory
Experimental	42.94	0.88	Outstanding

**Table 3. Learning Gains of the Control Group and Experimental Group**

Groups	Pretest Mean Score	Post-test Mean Score	Learning Gain	Normalized Learning Gains	Interpretation
Control	31.28	36.45	5.17	67.73	Effective Enough
Experimental	32.49	48.94	16.45	81.43	Effective



**Table 4. Difference Between the Pretest and Post-Test Mean Scores of Control and Experimental Groups**

Groups	Mean Difference	SD	t	p-value	Interpretation
Pretest Mean Score of both Control and Experimental Groups	1.21	0.78	.044	.824	Not Significant
Post-test Mean Score of both Control and Experimental Groups	11.4	0.83	7.05	.001	Significant

**Table 5. Difference between the Learning Gains of Both Control Group and Experimental Groups**

Groups	Mean Difference	SD	T	p-value	Interpretation
Learning Gains of both Control And Experimental Groups	11.28	.06	6.83	.001	Significant

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