

Learners' Engagement Improvement Through the Utilization of Online Interactive and Manipulative Instructional Materials in Teaching English

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Abstract

Transitioning from a classroom to an online class is difficult for teachers and students, who must exert extra effort to stay engaged in the home environment, which is surrounded by potential distractions. The purpose of this study was to engage learners in online learning activities. It used experimental and control groups to investigate the effectiveness of online interactive and manipulative instructional materials for improving learners' engagement in teaching English. The static-group comparison, also known as the posttest-only experimental research design, was used in this study to identify differences in posttest scores between the experimental and control groups, as well as to investigate the relationship between learners' perceptions of engagement and interactions in an English online class and their posttest performance. The researcher used the Statistical Package for the Social Sciences (SPSS) software to analyze the collected data, employing the following statistical tools: weighted mean and descriptive rating, frequency distribution, independent sample t-test, and automatic linear modeling and regression. According to the findings of this study, using interactive and manipulative instructional materials can help online learners outperform traditional instructional materials in terms of academic performance and enable learners to become self-disciplined.

Keywords: *interactive, engagement, instructional materials, online class*

Introduction

Most countries have announced temporary school closures, affecting more than ninety-one (91) percent of learners worldwide – approximately 1.6 billion children and young people. In the Philippines, Department of Education (DepEd) Secretary Leonor Briones declared the opening of classes to 24.7 million enrolled learners and 866,512 teachers in primary education across the country on October 5, 2020. That was the first time in Philippine history that the entire basic education system would forego face-to-face classes and adopt various distance learning modalities as modes of instruction due to the COVID-19 pandemic. Alternative learning modalities (Asio & Jimenez, 2021) this school year include digital modular distance learning; printed modular

distance learning; synchronous online distance learning; asynchronous online distance learning; television-based instruction; radio-based instruction; and blended distance learning.

Shifting from a classroom to an online class is challenging for teachers, learners, and the school (Paguio et al., 2022), who must exert an extra effort to stay engaged amid the home environment being surrounded by potential distractions. Interaction between teachers and students improves learners' satisfaction and learning outcomes (Moore, 2002). The finding from Zhang et al. (2007) showed that learners also need teachers to facilitate online discussion forums to give direction, which makes learners more comfortable with their discussion.

To cope with this challenge, educators should seek ways to improve and incorporate better teaching and learning strategies in English. The use of interactive and manipulative instructional materials in teaching English increases the engagement and interest level of the learners. According to the Stanford University School of Medicine, interactive learning actively engages the students in wrestling with the material.

Integrating the utilization of interactive and manipulative instructional materials with an emphasis on the thought process of learners provides an opportunity for the teacher to assess and meet the needs of learners as they construct personal knowledge. Using manipulatives may make the instruction period longer initially, but learners retain the knowledge better and will require less review time later (Schweyer, 2000). Interactive and manipulative instructional materials comprise text, images, audio, video, animations, and other interactive online activities.

For many years, teachers have used manipulatives in the classroom. Teachers recognize that manipulatives provide a tangible foundation for learning abstract concepts. Many studies have shown that participation improves the participant's ability to learn. According to Bucholska (2019), for those committed to their learners' learning and engagement, the concept of interactive material should now extend far beyond having a place where learners can see some images and click next. When we talk about interactive learning materials, we mean that the learner must solve problems, make decisions, and search for information, test assumptions, and take risks rather than passively going through the material. The online teaching strategies in this study aimed to engage learners in learning activities in an online environment. This study investigated the effectiveness of online interactive and manipulative instructional materials for learners' engagement improvement in teaching English using experimental and control groups.

Methodology

Research Design

The proponent of this study used a static-group comparison, also called the posttest only experimental research design. The static-group comparison design is a quasi-experimental design in which the outcome of interest is measured only once, after exposing a non-random group of participants to a treatment, and compared to a control group (Choueiry, 2021). In this design, there is an experimental group that received a treatment, which is the interactive and manipulative instructional materials, and the control group that received a typical or standard treatment. The researcher attempted to identify and analyze the differences between the experimental group and the control group.

Additionally, descriptive survey design was used to collect original data to describe a population too large to observe directly. A survey obtains information from a sample of people by means of self-report, that is, the people respond to a series of questions posed by the investigator (Hungler, 1993). In this study, self-administered questionnaires were distributed to the respondents online. This type of survey has been selected because it provides an accurate description of the characteristics, for example, behavior, opinions, abilities, beliefs, and knowledge of a particular individual, situation, or group. This design was chosen to meet the study's objectives, which were to create an instrument to assess learners' engagement and interactions in online classes. Thus, the main purpose and reason of the study was to increase understanding of grade four learners' perceptions of their engagement and interactions in online classes and their posttest performance scores, and to determine the effectiveness of online interactive and manipulative instructional materials in teaching English online.

Participants of the Study

The respondents of this study were the grade four learners of Olongapo City Elementary School during the school year 2021-2022, who chose the online learning modality. This study utilized stratified sampling and simple random sampling. The researcher divided the grade 4- Quezon online learners into two groups using stratified sampling —the experimental and control groups. According to Thomas (2021), researchers rely on stratified sampling when a population's characteristics are diverse and want to ensure that every characteristic is properly represented in the sample. The proponent of this study utilized simple random sampling with the help of random group generators software to select samples from the population, which is the grade 4-Quezon for the experimental and control groups. Based on Business Research Methodology, many dissertation supervisors advocate using random sampling methods because they are more representative of the sample group and leave less room for researcher bias than non-random sampling techniques. However, because these methods require a complete list of relevant population members and a large sample size, they can be difficult to apply in practice. The control group consisted of ten (10) online learners from grade 4-Quezon whom the researcher did not treat, while the experimental group consisted of ten (10) online learners from the same class section who were treated in this study. The proponent obtained a total of twenty (20) sample sizes, which is the total of learners who chose online learning modalities in grade 4- Quezon.

Research Instrument

This study utilized an online survey questionnaire and a posttest worksheet as the research instrument. The online questionnaire comprises two sections. The first section is the demographic information questions for respondents, including their name, grade, and section. The second section is a Likert-type scale questionnaire. The researcher adapted the Student Course Engagement Questionnaire (SCEQ; Handlesman et al, 2005), so the instrument can be considered valid and reliable. The questionnaire consisted of five factors such as Applied Engagement, Goal-Oriented Engagement, Self-Disciplined Engagement, Interactive Engagement, and Instructional Materials Engagement, with three (3) questions each. This deals with learners' perceptions of their engagement and interactions in online classes. The posttest worksheet consisted of a 20-item evaluation questions, a standardized evaluation questionnaire by the Olongapo City Elementary School. It has three (3) parts that covers the topic on preposition of place in fourth quarter: (1) Identification; (2) Multiple Choice; and (3) Fill-in-the-blank tests.

Data Analysis

All data were collected online using Google Forms and downloaded into a Microsoft Excel file for organization, analysis, tabulation, and processing using the Statistical Package for the Social Sciences (SPSS) software. The following were the statistical treatments that were employed to answer the specific questions raised in this study: weighted mean and descriptive rating; frequency distribution; independent sample t-test; and automatic linear modeling and regression.

To describe the minimum and maximum length of the 5-point Likert type scale of perceptions on interactions and engagement in online class of the learners, weighted mean and descriptive rating was used by the researcher. A weighted mean is a kind of average. Instead of each data point contributing equally to the final mean, some data points contribute more weight than others (Abdale, 2014). In this statistical treatment, the final average number reflects the relative importance of each observation and is thus more descriptive than a simple average. The Table 1 shows an overview of interpretation for likert-scale questionnaires. Additionally, to describe the skill acquisition of online learners, the researcher utilized a Five (5) Stage Model of Acquisition of Dreyfus et al (1980).

The researcher used an independent sample t-test to see if there was a significant difference between the experimental and control groups' posttest performance scores. According to Patel in 2020, the independent sample t-test is a statistical method of hypothesis testing that determines whether there is a statistically significant difference in the means of two independent samples. Multiple Linear Regression was used to test the significant relationship between the perceptions of learners on their engagement and interactions in English online class and posttest performance scores. Hayes (2022) defined multiple linear regression as a statistical technique that predicts the outcome of a response variable using several explanatory variables. Multiple regression is essentially an extension of ordinary least-squares (OLS) regression in that it involves more than one explanatory variable. The researcher used a p-value of 0.05 to compare and to determine the difference and relationship between observed data and expected data due to chance. Through that, it helped the researcher to determine whether there is statistical evidence that the means are significantly different or have any significant relationships.

Results and Discussion

This part presents the findings, analysis, and interpretation given in relation to the problem being investigated. It includes online learners' perceptions of their engagement and interactions in English online class, posttest performance scores of the experimental and control groups, the significant difference between the experimental and control groups using their posttest performance scores, and the significant relationship between learners' perceptions of their engagement and interactions in English online class and their posttest performance scores.

Table 1
Weighted Mean of Respondents' Perception on Their Engagement and Interactions in English Online Class

Group		Factors					Average Weighted Mean	Descriptive Rating
		Applied Engagement	Goal-Oriented Engagement	Self-Disciplined Engagement	Interactive Engagement	Instructional Materials Engagement		
Experimental Group	Mean	4.37	4.27	4.54	4.57	4.4	4.43	Very characteristic of me
	N	10	10	10	10	10		
	Standard Deviation	0.36683	0.71665	0.32203	0.27442	0.64406		
Control Group	Mean	3.43	3.3	3	2.27	2.1	2.82	Moderately characteristic of me
	N	10	10	10	10	10		
	Standard Deviation	0.8756	0.67495	0.91625	1.07497	0.44583		

Table 1 presents the descriptive rating of the Grade 4-Quezon online learners' perceptions of their engagement and interactions in the English online class. The table below shows that the experimental group who received the treatment felt very engaged in the English online class thanks to interactive and manipulative instructional materials. They thought that they had the desire to learn the materials through finding ways to make them relevant to their lives. This group showed effort to do their tasks in order to get a good score. Additionally, they have self-discipline by looking over their notes for them to understand the discussion and making sure that they are listening attentively to the online course. The experimental group is always raising their hands whenever they have clarifications and answers to certain questions from the facilitator, and what matters most is that they had fun in the lesson. Lastly, it is very evident that the learning materials used by the teacher helped the learners to promote engaging and interactive online classes. The average weighted mean result of 4.43 for the experimental group implied that the factors in their engagement and interactions in English class were very much their characteristics. Those perceptions matched those of the control group regarding their engagement and interactions in the English online class. They did, however, have a lower average weighted mean score of 2.82 than the experimental group. According to the findings, the control group perceived that they moderately demonstrated the factors of their engagement and interactions during the English online class.

It is the material that students engage with to better themselves, meet their goals, and ultimately succeed in your course, according to Wiley University Services (2022). This can take many forms in the online environment, including written e-books, video lectures, interactive lessons, and more. When we talk about instruction, we mean any course element that students use to move from unfamiliarity to familiarity. In other words, instructional materials are the various modes and channels of communication that a classroom instructor may use. It is used to clarify and define an idea during the teaching and learning process. Every lesson that a teacher creates should include explicit learning objectives from the curriculum. A defined, unique learning sequence that the students will follow to achieve the specified objectives will also be included.

Table 2
Percentage Frequency Distribution of Posttest Performance Score

		Scores Range					Total
		17-20 (Expert)	13-16 (Proficient)	9-12 (Competent)	5-8 (Advanced Beginner)	0-4 (Novice)	
Experimental Group	Count	8	2	0	0	0	10
	Percentage (%)	80	20	0	0	0	100
Control Group	Count	1	3	4	2	0	10
	Percentage (%)	10	30	40	20	0	100

Table 2 shows the percentage distribution of posttest performance scores for grade 4- Quezon online learners when grouped by group. Most of the experimental group were experts, with eight (8) of them scoring 17–20 and the rest scoring proficient. Four (4) out of ten (10) online learners in the control group are competent, with scores ranging from 9-12. Only one (1) online learner received the highest score, three (3) received 13-16, and two (2) received 5-8. This indicates that, when compared to the other group, the group facilitated by the researcher using interactive and manipulative online instructional materials had the highest number of online learners who received high scores. Adubule et al (2015) found that learners taught using instructional materials performed significantly better than the control group in their study on the impact of instructional materials on the academic performance of learners. Students will perform better in general if they are given the opportunity to interact or participate effectively in the teaching and learning process using instructional materials.

Table 3
Significant Difference Between the Experimental Group and the Control Group Using Their Posttest Performance Scores

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2- tailed)	Mean Difference	Standard Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Score	Equal variances assumed	3.937	.063	4.634	18	.000	5.80000	1.25167	3.17035	8.42965
	Equal variances not assumed			4.634	13.02 0	.000	5.80000	1.25167	3.09637	8.50363

Table 4
Group Statistics in Independent Sample T-Test

	Group	N	Mean	Standard Deviation	Standard Error Mean
Score	Experimental	10	18.1000	1.72884	.54671
	Control	10	12.3000	3.56059	1.12596

The relevant result for the independent sample t-test is ringed in Table 3. The null level of significance is .063. Because this figure exceeded the p-value of .05, the researcher accepted the null hypothesis. That is, despite the big difference in mean values between the experimental and control groups, there is no significant difference in posttest performance scores between the two groups. According to Huitt (2011), instructional materials are not the primary reasons why students perform well. He proposed that motivations and desires give students a reason and direction to do well in school.

Table 5
Significant Relationship Between the Perceptions of Learners on Their Engagement and Interactions in English Online Class and Their Posttest Performance Scores

Factors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Standard Error	Beta		
(Constant)	1.754	3.917		.448	.661
Applied Engagement	-.549	.930	-.110	-.590	.565
Goal-Oriented Engagement	1.537	.854	.320	1.799	.094
Self-disciplined Engagement	2.648	.906	.678	2.923	.011
Interactive Engagement	.246	.784	.086	.313	.759
Instructional Materials Engagement	-.321	1.027	-.103	-.312	.760

Table 5 shows the significant relationship between grade 4-Quezon online learners' posttest performance scores and their perceptions of their engagement and interactions in an English online class.

The level of significance of .565 implies that there is no significant relationship between the learners' applied engagement and their posttest performance scores. This means their ways of finding ways to make the course materials relevant to their lives has nothing to do with their scores.

The level of significance of .094 indicates that no significant relationship exists between the learners' goal-oriented engagement and their posttest performance scores. This means that the effort they put into complete learning tasks in order to get a good grade has nothing to do with their scores.

The significance level of .011 indicates that a significant relationship exists between the learners' self-disciplined engagement and their posttest performance scores. This means that they were able to get a high score by reviewing the lesson content on their screen monitor, taking notes, and listening to their online class.

The significance level of .759 indicates that no significant relationship exists between the learners' interactive engagement and their posttest performance scores. This means that raising their hands whenever they have clarifications or responses to the facilitator's questions, actively participating in an online class, and having fun while learning is not factors in receiving a high score.

The significance level of .760 indicates that there is no significant relationship between the learners' engagement with instructional materials and their posttest performance scores. This means that the instructional materials have no bearing on obtaining a high score.

Figure 1

Regression Plot of Relationship Between the Perceptions of Learners on Their Engagement and Interactions in English Online Class and Their Posttest Performance Scores

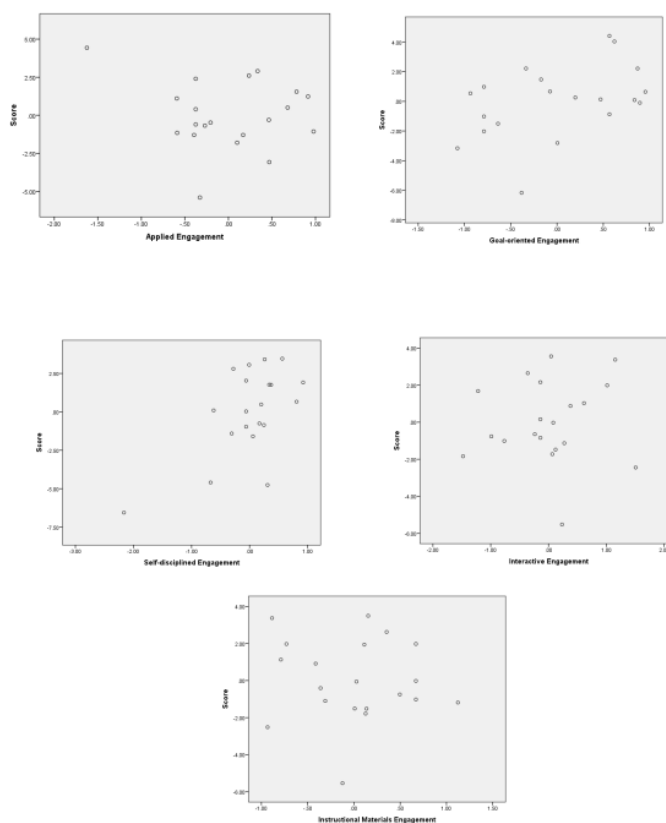


Figure 1 shows a graphical representation of the relationship between learners' perceptions of their engagement and interactions in an English online course and their posttest performance scores. Only self-disciplined engagement has a positive linear relationship to posttest performance score in this study, according to the regression plots below, while goal-oriented engagement is the least

important. The use of interactive and manipulative online instructional materials assisted online learners in developing self-discipline, which improved learning and performance. In fact, a 2022 study from the University of Pennsylvania shows that self-discipline is essential for academic success. Even if they have the same intellectual ability, students with high self-discipline outperform those with low self-discipline. Furthermore, researchers discovered that students who have strong self-control are more careful in their tasks, which improves their performance.

Conclusion

The primary goal of the study was to gain a better understanding of grade four students' perceptions of their engagement and interactions in online classes. Its goal was to get students involved in online learning activities. It also aimed to determine the effectiveness of online interactive and manipulative instructional materials in increasing learners' engagement in English teaching. Based on the aforementioned findings, the following were concluded:

1. When the instructional materials used in an online class are engaging and allow students to interact with and manipulate them, it improves how students perceive their levels of engagement and interactions when learning through an online platform.
2. Using interactive and manipulative instructional materials can help online learners outperform traditional instructional materials in terms of academic performance.
3. Enable the students to become self-disciplined by taking notes, listening, and actively interacting with the class virtually by using interactive and manipulative instructional materials in teaching English online classes. This is because such materials give them the impression that they are simply having fun while learning.

Recommendations

Based on the findings of this study, the researcher made the following recommendations based on the study and analysis of the respondents' posttest performance scores and perceptions of their engagement and interactions in an English online class:

1. Online teachers must improve their teaching effectiveness by using interactive and manipulative instructional materials, which improves students' academic performance and engagement in class.
2. All online teachers should use interactive and manipulative instructional materials not only in English but in all subject areas.
3. Education stakeholders will organize regular workshops, seminars, training, and conferences for English online teachers to update their teaching strategies.
4. As course content, the teacher training institution must use interactive and manipulative instructional materials.
5. Similar studies should be conducted in other areas of learning.
6. A longer trial period is recommended to assess the student's level of engagement and interactiveness before and after treatment.

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