

Synchronous Learning Approach in Enhancing the Academic Performance of Grade Three Pupils in Science

Vernalie L.Prudente
Malanday Elementary School

Abstract:- The primary purpose of this study is to enhance the academic performance of Grade 3 pupils in Science using a synchronous learning approach. The design of the study was a quasi-experimental one-group pretest-posttest design. The study subjects were the 28 grade 3 learners of Malanday Elementary School during 2020-2021. A 25-item validated teacher-created test was administered as a pre-and post-test. The findings of the pre-and post-tests were evaluated using mean, standard deviation, and t-test. Based on the study's findings, most learners performed within and beyond the standards set when they were taught using the synchronous learning approach. Therefore, it can be safely inferred that the synchronous learning approach is an effective strategy for improving learners' academic performance.

Keywords:- Synchronous Learning Modality, Quasi-Experimental One-Group Pretest-Posttest Design, Academic Performance, Learners, Science Subject.

I. INTRODUCTION

Teachers, lecturers, and resource speakers have modified their practices in response to the impact of the health crisis on classrooms. The researcher, a third-grade Science teacher at Malanday Elementary School, expressed this opinion during the school year 2020-2021. While implementing the limited face-to-face teaching and learning mode, the researcher had to maximize the time and resources available to ensure that the learners acquired the essential competency.

This is why the researcher conceived this study: to analyze formally the effectiveness of synchronous learning in enhancing the academic performance of students enrolled in Science 3 during the school year 2020-2021. As part of her research, she supplied learners with more valuable modules by incorporating synchronous learning. The researcher then surveyed to see how frequently students used video conferencing software. The researcher knew a new class would be online but hoped it would adhere to the same structure as traditional face-to-face instruction. She planned to meet with them at least twice weekly to discuss confusing lessons. Each student in the synchronous class has an Internet connection and a device to use during class time.

In this age of widespread COVID-19 infection, it is best to utilize online synchronous and asynchronous learning

platforms to maximize your education. The instructor may utilize Google Meet, Google Classroom, or a YouTube video course inside this framework. Students can feel like part of a thriving learning community using the numerous resources available. Learners can share their opinions and ask each other questions in a second. Although the current Covid-19 pandemic has endured, by regional government restrictions, education is delivered in some regions. This is particularly true with brave education (on the network). During a pandemic, it is permitted to engage in daring learning because such activities cannot occur in a specific classroom context. These academic objectives can be attained with the aid of brave research. To develop a state-of-the-art educational system, you must provide your teachers and students with the same Internet-based ICT instruction.

Via technology, both real-time and self-paced online classes are accessible. These two types of cyberspace communication are known as synchronous and asynchronous. Teachers and students interact in real-time (face-to-face) online training through synchronous learning using Zoom or Google Classroom (Google Meet). In contrast, online asynchronous learning occurs when a teacher utilizes an app to offer information to students without requiring them to interact in real-time. The students can read and comprehend the textbook independently. Teachers and students engage in real-time (face-to-face) communication and collaboration in synchronous online learning (Johnson, 2006).

The learning occurs during synchronous, real-time interactions. Various forms of digital media facilitate interaction among you, your students, and your instructor (Finkelstein, 2006). Due to the necessity of physical presence, the conversation can only occur at a convenient time or location for the participants. This methodology most closely resembles a traditional classroom environment. There are several ways to facilitate synchronous learning. Zoom is merely one instance of a helpful program you may utilize (Fitch et al., 2016). Depending on your preference, you can split the screen or take turns controlling the screen.

When students and instructors use the same online platform for instruction and discussion, synchronous learning happens. The term for this type of software is "synchronous learning environment." Access to the Internet is required for a synchronous system to function, as all learners' devices must be synchronized across multiple geographic regions.

II. RELATED LITERATURE

As noted by Shahabadi and Uplane (2015), in synchronous instruction, both the instructor and the student are online concurrently. Learners must attend at the designated start time, and the course length is likewise fixed. Once a month or once a year, sessions could be held. Participants in a synchronous e-Learning session can view the same whiteboard, electronically raise their hands, and converse. This method of distance education most closely resembles conventional classroom training. The use of audiovisual conferencing, online platforms, and telephones for collaborative training sessions is widespread.

In recent years, synchronous language learning has gained favor as a more conversational approach to teaching and learning a language. It employs whiteboards, video chats, and voice conversations to provide immediate feedback on language learners' progress. Thus, it can work like a classroom filled with students (Keegan, 2013). In a synchronous language classroom, the instructor and the students can provide and receive feedback in real-time, and the students can rapidly develop new content. Both instructors and students can use timely feedback to assess their performance and learn from their mistakes. Participating in synchronous internet-based discourses enhances students' understanding of complex issues in person (Pfister, 2005; Pfister & Oehl, 2009). Learners may encounter difficulties if they attempt to use technology at specified times or rely on its availability during the entire session.

Recent tendencies indicate that synchronous online education is more prevalent than asynchronous alternatives. Students feel more linked to their lecturers in synchronous online learning environments which employ innovative technologies (Watts, 2016). Since synchronous online interactions enabled quick reactions and active conversation between teachers and students, students warmly accepted them. Hence, participation in online courses increased (Falloon, 2011; Hrastinski, 2008; Strang, 2013; Watts, 2016).

Some students perform better in synchronous online classes because they prefer one-on-one instruction. Some enjoy the slower pace of asynchronous online learning settings before submitting their self-directed tests, and some prefer the instantaneous feedback of a live online class. Learners' engagement in a synchronous online learning environment must occur in real-time. Active learning occurs in synchronous and asynchronous e-learning environments when learning activities and expectations mirror traditional classrooms (Liaw & Huang, 2013).

Students utilizing a synchronous e-learning platform can engage in real-time, two-way dialogues with their instructors and classmates (Monahan et al., 2008). Internet research also requires the utilization of different chat groups. This type of information is not available anyplace else than the Internet. According to Skylar (2009), one of the benefits of a synchronous learning environment is the ability for students to communicate with one another and the instructor in real-time, as well as receive fast feedback on any questions

they may have, in contrast to the "anytime, anywhere" promise typically associated with online classes. However, this setup necessitates scheduled meeting hours.

Tabatabaei and Sharifi (2011) also stated that "discussion forums and online chat rooms have greater potential for enhancing language teaching and learning since they enable synchronous, real-time dialogue between users." Before making a quick answer, participants are given a small amount of time to process the on-screen data. "Synchronous media can present significant scheduling challenges, especially if the teacher wishes to address the entire class and engage in one-on-one interactions," write Mick and Middlebrook (2015). This is highly challenging to achieve when synchronous media are utilized, and the teacher simultaneously addresses the entire class.

Several scholars have examined the efficacy of online classrooms and reached contradictory conclusions regarding the benefits and drawbacks of these educational settings. Most studies of remote learning compared student performance in a regular classroom with that of an online course taught by the same instructor. Due to the diversity of activities involved in online education, asynchronous rather than synchronous learning may have unexpected outcomes. Consequently, research testing the efficacy of several instructors presenting the same course in synchronous online learning environments is necessary. This study seeks to determine whether the use of synchronous learning improves the academic performance of Grade 3 pupils.

III. METHODOLOGY

This study employed a quasi-experimental, one-group, pretest-posttest design to determine if the synchronous learning technique enhanced second graders' reading skills. According to Choueiry (n.d.), the one-group pretest-posttest design is a quasi-experimental approach in which the outcome of interest is examined twice: before and after exposing a non-random group of participants to a specific intervention therapy. Participants are not randomly assigned to receive the intervention treatment in this setup. On the other hand, a quasi-experimental technique is similar to an experimental study in that it treats some changes to variables as an independent. In contrast to experimental studies, there is no active manipulation or random assignment and no use of a control group (Iowa State University: University Library, n.d.).

This action research met the criteria for a quasi-experimental study since it investigated whether or not learners' academic performance improved through synchronous learning. This was determined by comparing results from pre- and post-intervention surveys.

Twenty-eight Grade 3 learners from Malanday Elementary School in the 2020-2021 academic year were included in the research. Purposive sampling was used to choose the potential participants. Respondents are chosen through purposive sampling if they are easily accessible or readily available. The main drawback of this strategy is that

the researchers have to figure out how representative the sample data is of the whole population. Nonetheless, the data may provide beneficial insights and serve as a solid foundation for future exploratory studies (Ary, Jacobs & Razavieh 2015).

The research questions were answered using a pair of questionnaires. The first survey was a 25-item pre-test that the teacher designed to gauge the learner's familiarity with the material presented here. The focus of the test was on the learning competencies in Science 3. The second survey was an evaluation of the class discussion, consisting of 25 teacher-made questions.

The pre-and post-tests were analyzed by five (2) school curriculum coordinators. Having determined the reliability of the assessments, a pre-test was given to the learners. The pre-test survey was collected after the exam, and the results were tabulated. The instrument's validity was evaluated using a five-point Likert scale system, as shown in Table 1.

Table 1. Scaling Method for the validity of the instrument

Score	Descriptive Rating	Interpretation
5	Very Highly Valid	No flaws observed; nothing more to be desired to make it better.
4	Highly Valid	Very little flaws are observed; minor rewording of a few items needed.
3	Moderately Valid	Some flaws are observed; the overall usefulness is diminished only slightly.
2	Fairly Valid	Several flaws are observed; overall usefulness is diminished greatly.
1	Not Valid	Major revision is needed to make it useful.

All data collection operations were conducted in accordance with established health regulations. The researcher had the approval of the school's administration and the school's teacher in charge for the school year 2020-2021 before beginning the study and collecting data from learners in the treatment group.

To address the first problem, the researcher calculated the average and standard deviation of the learner's performance to get a sense of their proficiency with the synchronous learning approach. The knowledge was gained by contrasting the learners' pre-and post-test scores. The researcher combined the learners' pre- and post-intervention scores before determining the mean. She then proportioned this sum to the total number of learners who had successfully finished the test. The average was calculated by multiplying that number by 100, which she did.

The effectiveness of synchronous instruction was measured by comparing learners' proficiency levels before and after the intervention. Using the T-test, the researcher can see a sizable difference in learners' progress between their pre-and post-test scores. The statistical analysis revealed the degree of dissimilarity between the two examinations. In order to do this, we compared the two tests' mean scores and their variability using t-tests.

According to Hayes and Westfall (2020), the t-test is used to determine if there is a statistically significant difference in the means of the treatment groups. This test, as described by Bevans (2020), is commonly used in hypothesis testing to determine whether or not a given strategy or treatment affects the population of interest or whether or not two groups can be distinguished. The t-test is used to test the hypothesis that the results are not different before and after the intervention, which is the null hypothesis in this experiment. The outcomes are equivalent to the null hypothesis. The null hypothesis is based on the idea that pre-and post-intervention results will not be noticeably different. This study's results involve comparing the baseline scores with those obtained after the intervention

IV. RESULTS AND DISCUSSIONS

➤ The Level of Academic Performance of Grade 3 Learners in Science Before and After Utilizing Synchronous Learning Approach

Table 2 presents the level of academic performance of Grade 3 learners in Science before and after using Synchronous Learning Approach.

	Mean	Standard Deviation
Pretest	6	2.49
Posttest	23.41	1.11

The average score before and after the intervention was 6 and 23.41, respectively. Further, the standard deviation was 2.49 on the initial exam and 1.11 on the final test. There was also a significant increase in test performance from pre- to post-test results. Rising averages indicate improved learner knowledge across the board. Since the standard deviation has decreased from 2.49 to 1.11, this is a sign of increased competency on the part of the learner.

Hussain, Saeed, and Syed (2020) concluded that synchronous learning was an effective and efficient technique for meeting the educational goals of distance learners. Therefore the results of this study are consistent with theirs. Synchronous learning was proven to be an efficient and successful method of meeting the educational needs of distant learners. To a similar extent, Caroro, Jomuad, and Lumsag (2013) found that learners benefited greatly from using an online learning system due to its simplicity and portability. According to Lambda Solutions (n.d.), these findings are consistent with their claims about synchronous learning's efficacy. The benefits of synchronous learning are argued to stem from the fact that 1) different learning styles and skill levels can coexist in the same classroom setting, 2) offline activities can be supplemented with visual, aural, and interactive content, and 3) distance and time are not barriers to participation. When learners had a positive impression of synchronous online interactions, they were more likely to take advantage of online learning opportunities. They could talk to their teachers and get responses from their classmates immediately (Falloon, 2011; Hrastinski, 2008; Strang, 2013; Watts, 2016).

➤ *Significant Difference Between the Level of Academic Performance of Grade 3 Learners in Science Before and After Utilizing Synchronous Learning Approach*

Table 3 shows the significant difference between the level of Academic Performance of Grade 3 learners in Science before and after utilizing Synchronous Learning Approach.

	Me an	df	t-score	t- critical	p- value	Decis ion
Pre- test	6	72	-+34.32	2.00	0.0	reject
Post- test	23.4 1					

The T-score of -+34.32 is higher than the t-critical value of 2.00, as seen in Table 3. The null hypothesis that second graders' pre- and post-Synchronous Learning Approach reading levels are not different can be rejected with a standard error of 0.05. Furthermore, the significance level is 0.000. For the null hypothesis to be rejected, the p-value must be lower than 0.05. This indicates that the second-grade learners' reading skills have improved thanks to the synchronous learning technique.

Hrastinski (2008) found that when time is not an issue, asynchronous online learning is the best option for reevaluating previously completed complex assignments. On the other hand, the users of a synchronous online learning platform can interact with one another and work on group projects in real-time. Strang (2013) analyzed the pros and cons of synchronous and asynchronous team meetings in her project management classes. She found that synchronous communication significantly boosted teamwork compared to asynchronous communication. In order to foster collaborative learning, online training, like face-to-face training, has to incorporate course-related communications, task planning, and social support (Haythornthwaite, 2002; Hrastinski, 2008).

Thirty learners in a program for teacher education conducted a comparison study and concluded that synchronous communication tactics are more effective than their asynchronous counterparts. Falloon (2011) argues synchronous systems are better for education and communication.

Blending synchronous and asynchronous online learning environments, as proposed by Giesbers et al. (2013), has the potential to improve the quality of the learning process. The researchers used web videoconferencing and online forums to show how both types of the communication might be beneficial. Duncan, Kenworthy, and McNamara looked into real-time and delayed online forums (2012). The results of two final exams and overall course grades were analyzed, and researchers found synchronous involvement improved learner performance. In total, 262 learners participated in the research. When using synchronous online learning, teachers and learners can interact in real-time

V. SUMMARY, CONCLUSION, RECOMMENDATION

➤ Summary

The main purpose of this study is to improve the academic performance of the Grade 3 learners in Science enrolled at Malanday Elementary School during the school year 2020-2021 using synchronous learning approach. Specifically, the study determined the level of academic performance of Grade 3 learners before and after utilizing synchronous learning approach; and the significant difference between the level of academic performance of Grade 3 learners before and after utilizing synchronous learning approach.

The research design of the study was a quasi-experimental one-group pretest-posttest design. The study subjects were the twenty-eight Grade 3 learners enrolled at Malanday Elementary School during the school year 2020-2021. A 25-item validated teacher-created test was administered as a pre-and posttest. The findings of the pre-and posttests were evaluated using the mean, standard deviation, and t-test.

Findings showed that the mean posttest score was considerably more significant than the mean pretest score. The rise in the mean value indicates an overall improvement in the competency level of the learners. The T-score is -+34.32, more than the t-critical value of 2.0. With a standard error of 0.05, the hypothesis that there is no significant difference between the level of academic performance of Grade 4 learners before and after using the synchronous learning approach was rejected.

➤ Conclusion

Based on the study's findings, it is possible to conclude that most learners who utilized the synchronous learning modality performed either up to or above the established standards. Therefore, it is safe to deduce that the synchronous learning modality is an excellent technique for boosting the level of academic performance of Grade 3 learners.

➤ Recommendation

The researcher strongly suggests the following in light of the study's findings and conclusions.

- In classes that are particularly difficult for learners to understand, school administrators may push teachers to use modular distance learning as a pedagogical tool and combine it with other online resources.
- Teachers might make extra efforts to provide engaging resources for English instruction, such as presentations and video clips.
- Teachers and principals may also ask parents to monitor their children while they go through online modules.
- A fourth possibility is to pursue research along these lines in some other academic field

AKCNOWLEDGEMENT

The researcher is filled with gratitude to the following people who have been a part towards the completion of this study

To the **Grade 3 pupils of** Malanday Elementary School, for being the researcher's participants in the study;

To her family who has extended so much inspiration and help in all aspects.

Above all, to Almighty God for His love and mercy.

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