

NEARPOD FOR MATHEMATICS: REALIZING FUNCTIONS AND RELATIONS BETWEEN SETS

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ABSTRACT

This study tries to evaluate the teaching and learning process of Teaching Functions and Relations of Sets using Nearpod. The purpose of the study is to determine whether Nearpod can be used as a Learning Platform in interactively teaching Functions and Relations between Sets in a Blended Learning Environment. This is a phenomenological study conducted in a Mathematics Class at Marikina Polytechnic College. A lesson was presented and delivered to MAT Mathematics Major students of the Marikina Polytechnic College who also assess and evaluate the lesson based on the implementation of Nearpod in teaching Functions and Relations between Sets. Reflections and Feedback given by teachers were analyzed through a thematic approach. Results show that Nearpod provides ease of access to using different devices and promotes teaching both in online and face-to-face settings. Ease of access of creating diagrams through the Draw-it feature makes teaching and learning g functions and the relation between sets interactively engaging. There are, however, the teacher must be mindful of the risk in teaching relations and function of sets. To avoid it, the teacher must specify the objective of teaching Functions and relations between sets and delivering the lesson efficiently to maximize the potential of the feature of Nearpod. Thus, it is suggested to implement Interactive Teaching using Nearpod not only in teaching Mathematics but in other subjects.

Keywords: Nearpod, Functions and Relation, Mathematics Education, Interactive Teaching

INTRODUCTION

Mathematics is abstract learning and requires in-depth understanding. It is one of the subjects where students need additional help or

personalized attention sometimes. Reys, Lindquist, Lambdin, & Smith (2009) proposed that the mathematics learning process should be made entertaining and captivating, stimulating children's thinking and enabling them to build upon their prior knowledge and acquire new skills. Teaching mathematics needs an innovative and efficient

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educational technology where it can be incorporated into technological, pedagogical, and content knowledge (TPACK) as it is essential to provide quality education for students (Diokno et al., 2022). Using educational apps to teach this subject helps the teacher to teach well and the students understand the lesson. Nearpod is an educational app for delivering interactive presentations straightway to students on individual devices.

Burton (2019) claims that Nearpod is a learning platform or cloud-based program that allows students and audience members to attend classes via smart devices or any computer with an internet connection. Through the Nearpod application, teachers can prepare presentation slides by adding interactive features in it. In a critical review, Moore (2016) states that Nearpod, launched by Panarea Digital, has a Silver Edition offered for free. The Silver Edition has its perks which include the ability to reply to questions, with options for anonymity, and polls which are shared through the entire class. Additionally, administrators can incorporate online content from websites, movies, and photos to engage with students individually or in groups. "Nearpod can be accessed by students and teachers using a range of devices such as smartphones and personal computers. It also offers drawing tools and quizzes for more interactivity during an online session.

Nearpod can be a great tool for encouraging and motivating students during lectures. (Beranek and Vacek, 2014). The use of Nearpod as an interactive presentation software leads to meaningful outcomes and improved comprehension among students. This is achieved by a sustained and comprehensive engagement facilitated by a wide range of student-to-academic interactions. (Simpson and Welsh, 2014). The utilization of the Nearpod software has been demonstrated to be highly effective by both students and instructors, with particular regard to the attention-grabbing features it offers. (Beranek and Vacek, 2014). The teachers can use the Nearpod to teach the relation and functions in mathematics and you can create different activities where the students can participate. Before using this app in teaching relations and functions, it is

better if the students have a schema of how to use it to achieve a good flow of the lesson. In teaching relations and functions, the students must define the relation and function and determine if the given is an example of relations and functions. You can represent the relationships and functions using a table, mapping, or graph that you can make in a Nearpod, because it is built to work well with a lot of pre-existing tools, such as Microsoft PowerPoint, Google Slides and YouTube. It is useful as a formative assessment tool for the relations and functions that can easily output students' efforts and analyze the graphs and charts to determine if it is relations and functions.

Lesson study is a paradigm of fostering profession, which involves collaborative lesson planning strategized by a group of teachers. (Hobri, 2016). This concept was developed by Japanese educators as a form of interaction between the teachers' pedagogical and content knowledge. (Ebaguin, 2016). The lesson study will address the issues and expectations of teachers both online and in Face- Face Blended Teaching Environment instructions. This will open opportunities for mathematics teachers for their professional growth (Ebaguin, 2016)

OBJECTIVES OF THE STUDY

The purpose of this study is to determine if Nearpod will help mathematics teachers in teaching Relations and functions between sets. This study also aims to see if Nearpod can be used as a learning platform in a Blended Learning Environment.

METHODOLOGY

This is a phenomenological study conducted in a Mathematics Class at Marikina Polytechnic College. A lesson was presented and delivered to MAT Mathematics Major students of the Marikina Polytechnic College. They also assess and evaluate the lesson based on the implementation of Nearpod in teaching Functions and Relations between Sets.

A Lesson study by Jouberson, Callaghan, and Engelbrecht (2020), done in a blended



approach, was utilized in this research that focused on teachers collaborating to design lessons. The Procedure in this Lesson Study can be summarized as (1) Planning of the research lesson, (2) Implementation of the Lesson Study, (3) Observation of the lesson; and (4) Reflection and Refinement.

The researchers compiled all the information, reviewed the curriculum manual, and examined the content standards and fundamental learning competencies. The study's intended goal is to teach how to explain functions and relations and their features. Following that, a lesson on Functions and Relations, specifically about Relations and Functions between Sets, was chosen. Planning is an important first step in any process, including education. It helps us find the best way to reach goals and achieve what we want.. Success requires careful planning; it doesn't just happen. You must decide what you want to do and, more importantly, how you want to achieve it. To assure the lesson plan's effectiveness, the researchers carefully examined it and effectively designed the activities of the lesson.

Using interactive teaching methods has been consistently shown to lead to more positive student outcomes, such as improved attention, heightened interest in the subject, and increased enjoyment. (Bligh, 2000; Burrowes, 2003; Sivan et al., 2000). By adopting interactive teaching styles using the Nearpod, the teachers can make sure that how well students are responding towards a given subject material. By using interactive teaching methods, the learning process can be improved, resulting in benefits for both students and teachers, who can assess student progress. With this, the researchers adopted the teaching style to increase the student's interest in the learning process and make them active participants in the course.

A focus group discussion was conducted after the delivery of the lesson. The discussion was done to narrate, examine, and evaluate the lesson. Video and audio recordings were made and transcription and translation were carried out to the best of the researcher's ability. The interviews presented were used as data for this lesson study and precautionary measures were taken to

address certain ethical considerations, including, but not limited to, the following (1) there has been no identified harm through any means for research participants throughout the research process, and (2) the anonymity and confidentiality of study participants is of utmost importance. (Bell, E. & Bryman, A. 2007).

RESULTS AND DISCUSSION

The information gathered from the evaluators of the Lesson Study is summed up based on the use of Nearpod for Mathematics Teaching and the strategies that can be incorporated when using it.

1. Nearpod Use

Below are the observations of the evaluators on the use and features of Nearpod during the delivery of the topic.

The platform, Nearpod, was new and yet induced learners to convey their answers"-
Evaluators A

"A new app (Nearpod) is somewhat exciting for the learners to try." -Evaluators B

The evaluators piqued their interest on the presented learning platform. Nearpod provides different tools, such as live polls and games, that help the students to actively interact during the lesson discourse. (Burton, 2019)

"I think Nearpod is easy to use because I can use my mobile phone to participate in a class in Nearpod." -Evaluators C

"Even though I use tablet, I can still access a Nearpod class which I find it engaging because most of us are only using tablet or mobile phone during an online class" -Evaluators D

"For a student, It has the ability to access your learning materials during class through either a web browser or the free Nearpod

app on your personal electronic device.”
Evaluator E

The researchers are delighted that Nearpod can be accessed on different devices. Studies suggest that using Nearpod provides no restriction in what device to be used promotes active learning

“I discovered new innovative ways to teach Mathematics that can be applied to both face-to-face and online settings” -
Evaluator F

“I thought we can use Nearpod both in face-to-face and online classes because of the collaborative board” -Evaluator G

The evaluators show their interest in using Nearpod in both face-to-face and online settings. Nearpod uses an interactive whiteboard that promotes learning both face-to-face and in online settings.

“I appreciate the fact that as the teacher, I can share my presentation slides with the students through a unique code at the start of the session. This allows me to maintain control over the pace of the presentation and ensures that students can only view the current slide until I advance to the next one.”
-Evaluator H

“But what if the student wants to learn about the topic in their own pace?”
Evaluator E

“Nearpod also features a student-paced session with a separate pin so they can look at the lesson after the class”- Presenter A

One of the observed aspects in teaching at Nearpod is the pacing of the lesson. Nearpod gives benefits to teachers to control the pace of the presentation. It also offers student-paced sessions in a separate pin but it is sometimes disadvantageous for them because it could make them skip some topics. (Sanmugan,2019).

“I appreciate the ability to view the number of active students during the teaching session, which enables me to monitor student engagement and assess their learning progress through the online activities I've prepared using the app. This is a valuable tool for me as a teacher.”
Evaluator I

“Nearpod indeed gives good monitoring of active students, but what if the students have lost their connection or they have some technical issues in their devices during the class? I think we should take into consideration these” Evaluators J’s reply to.”
Evaluators I

Evaluators observed the ease of monitoring when using Nearpod. But one of the obstacles to teaching in a virtual setting is the technical issues (which include internet connections).(Hakami, 2017) Because of this, The teacher must be mindful of the availability of devices the students to ensure the monitoring will be secure and accurate.

2. Nearpod for Mathematics Teaching

The researchers used Nearpod to teach the Relations and Functions of Sets. Below are the observations of how Nearpod helped the teachers engage in teaching Relations and Functions of Sets.

In teaching relations and functions of sets using Nearpod, you can represent them by tabular, mapping, or equation form-method that Nearpod has.” -Evaluators K

“The teacher may present his/her lesson by showing schematic diagrams and graphs for the students to easily identify and recognize functions” -Evaluators L

One of the observations when teaching relations and functions of sets using Nearpod is its ease of access in creating different diagrams. This will not only help teachers but also students for

real-time interaction when teaching relations and functions of sets. (Abdullah,2022)

“The drawing tool is a helpful feature that allows students to participate by submitting their drawings. They can also use it to show their understanding of various subjects. And, if needed, they can also find an image or draw and upload a picture. Thanks for bringing this to our attention.” -Evaluator M

The draw-it feature of Nearpod was observed by the evaluators as one of the catalysts of teaching not only in teaching Functions and the relation between sets but also in topics that use diagrams and graphs. These features help the students to enhance their active learning in the classroom. (Riddick and Cooper,2018).

The app's quiz feature is a useful tool for evaluating student comprehension. The immediate generation of class data makes it a very efficient app”- Evaluator N

“As a teacher, I noticed that the app includes the option to ask open-ended questions during the session. The app makes it easy for me to review the answers given by students and incorporate their responses into the further class discussion” Evaluator O

Real-time Assessment of students' responses was observed as a feature of Nearpod during the delivery of the topic. Real-time assessment is important in mathematics teaching as it gives slight modification of teaching objectives and content that will help students reduce any misconception surrounding the topic. (Moreno and Pineda,2020)

3. Nearpod for Interactive Teaching

The researchers used interactive teaching as this is the preferential approach when using Nearpod as a Learning Platform. Below are the reflections that show how Nearpod incorporates several interactive teaching strategies.

The drag and drop are an example of gamification in Nearpod that I can ask the students to categorize or label the images that give an idea to students about the relations and functions after doing the activity.” -Evaluator P

“I can make gamified activities in teaching relations and functions in Nearpod apps for the students to become active and always participate.” -Evaluator Q

One of the observed interactive techniques that can be used in Nearpod is gamification. The Nearpod's gamification features motivate students to compete and improve their performance (Abdullah,2022).

“Now, with collaborations, I can create a direct to an open question. This exercise stands out because it gives me the option to approve which student responses should be displayed to the entire class on a screen in the style of a bulletin board. Like on social media, students' comments can contain both text and images, and other students can “like” them” -Evaluator R

“With the Nearpod app, students can engage in real-time discussions through collaborative activities. The anonymity of a collaborative board helps the students to give their answers and feedback without the pressure of speaking in front of others. This will promote their interaction” Evaluator F

“With the Nearpod app, students can see and engage with their classmates' posts on the slide wall, promoting further discussion and collaboration. They can add images and links to enhance their contributions to the conversation.”-Evaluator S

It was observed that the Nearpod promotes Interactive Collaboration through its Interactive Whiteboard. Nearpod provides immediate student feedback that will help you adapt to meeting the needs of students (Wood, 2021)

4. Aftermath

The primary concerns are relevant to the delivery of the topic and Nearpod use were discussed in the post-lesson debriefing.

“In the beginning of the discussion, the objective of the lesson or the specific lesson to impart is not explicit and to find out only after so many exercises” -Evaluator T

One of the first steps in delivering instruction is to specify the goals and objectives of the lesson. In this matter, the teacher must specify the objectives to give direction of what are the intended learning outcomes of the students.

“Give more time to learners to accomplish their work.” -Evaluator U

Despite the benefits of Interactive Teaching, it demands a large amount of time. Some studies have identified that time constraints became a barrier for teachers to implement student-centered approaches. (Powell-Moman and Brown-Schild, 2011; Chichekian and Shore, 2016). In this matter, the teacher must consider how to deliver the topic efficiently to maximize the potential of Interactive Teaching by using Nearpod.

CONCLUSIONS

Teaching Relations and Functions using Nearpod shows different features that promote engagement and interaction between teachers and students. Nearpod features ease of access to different devices and the opportunity for implementation for face-to-face and line instructions that shows its interactivity. Nearpod offers ease of access in creating diagrams and student's ability to provide information in diagrams through the draw-it feature makes teaching relations and functions of sets collaborative and engaging. Nearpod provides different interactive strategies, such as gamification and collaboration, to motivate students for real time interaction and improvement of performance.

RECOMMENDATIONS

Thus, it is suggested to implement Interactive Teaching using Nearpod not only in teaching Mathematics but in other subjects. There are, however, the teacher must be mindful of the risk in teaching relations and function of sets. To avoid it, the teacher must specify the objective of teaching Functions and relations between sets and delivering the lesson efficiently to maximize the potential of the feature of Nearpod.

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