
| RESEARCH ARTICLE

Mathematics Learning in the New Normal Through Teacher-Created Videos: The Freshmen University Students' Experience

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| ABSTRACT

This qualitative study aimed to describe the experiences of freshmen university non-mathematics, major students on the use of teacher-created videos uploaded on YouTube in learning mathematics in the new normal. The researcher utilized an open-ended interview questionnaire through google form to gather qualitative data, which were analyzed through thematic analysis. Twenty randomly selected students from a State University in the Philippines participated in the study. The study revealed that the students' experiences on the use of teacher-created videos in learning mathematics online exemplified that the videos were comprehensive, versatile and student-friendly, have implied the virtual presence of the teacher, and fitted to new normal learning. Hence, teacher-created videos are indeed helpful for the students to reflect on their learning progress through self-assessment as one of the features of the videos, making mathematics learning flexible in terms of time and place, and personalizing mathematics learning through the social and virtual presence of the teacher despite the pandemic.

| KEYWORDS

Teacher-created videos, online learning, YouTube videos, new normal learning, mathematics education

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1. Introduction

Teachers used to conduct lectures, interactive activities, and other classroom engagements in a face to face mode prior to the COVID-19 pandemic. However, this global health catastrophe opened doors of opportunities to modify the way we teach mathematics in schools. Because of the pandemic, education had to migrate to the online environment (Crawford et al., 2020; Syauqi et al., 2020). The Commission on Higher Education (CHED) advised institutions of higher education in the Philippines to implement distance education methods of learning for its classes, such as the use of educational technology, to maximize the academic term despite the suspensions (Hallare, 2020). Online learning is education that takes place over the Internet. Online learning is just one type of distance learning for any learning that takes place across distance and not in a traditional classroom (Ariyanti & Santoso, 2021), where content is delivered online, and students can participate in courses from anywhere (Florence & Anthony, 2019; Ferreira et al., 2018).

Based on the study of Tyaningsih et al. (2020), the online surveys and interviews with students about online learning depicted that some of the advantages of online learning were practical, versatile (can be done anywhere and anytime), and student-friendly. In addition, challenges have been evident in the use of online learning in the Philippines, especially in Mathematics courses (Cortez, 2020). The study of Ariyanti and Santoso (2021) found out that the average student's positive response towards mathematics before online learning is greater than after online learning. Challenges faced by students when participating in online learning include the issue of the lack of instructional materials on how to solve the problems given by teachers. The study of Guansi et al. (2020) in the Philippines found out that college students still prefer the learning process where the teacher discusses the lessons followed by evaluation. Hence, educational institutions need to train teachers on online learning, instructional materials, and interactive learning media (Syauqi et al., 2020).

With these limitations in pedagogy and learning resources in universities in the Philippines and other countries considering the new normal mode of learning, numerous studies suggested the use of educational videos in mathematics education and other fields. Ariyanti and Santoso (2021) found out that the students prefer online mathematics learning through videos where the teacher discusses the lesson in a step-by-step manner. It was also concurred by what Tanujaya et al. (2021) had advanced on the use of video in an effort to increase engagements between teachers and students in learning. Teachers need to make more creative and innovative strategies to achieve the learning outcomes of mathematics instruction. Wang (2021), in his study in an online undergraduate math course, revealed that students improve much more in test performance when using fewer technologies and tools like videos and forums. The Covid-19 pandemic exacerbated the need to integrate appropriate technologies like videos in education to make online aided learning (Pal & Patra, 2020).

To answer the need for the new normal learning in crafting instructional materials suited for online learning, the researcher has been using teacher-created videos to make mathematics learning flexible, effective, and efficient even during the pandemic. Hence, this study was conducted to describe the experiences of the freshmen university students in learning mathematics in the new normal through the use of teacher-created videos.

2. Methodology

This study employed the basic qualitative study. Basic qualitative studies, also called basic interpretative studies by some, provide rich descriptive accounts targeted to understanding a phenomenon, a process, or a particular point of view from the perspective of those involved. The central purpose of these studies is to understand the world or the experience of another (Ary et al., 2010). Since the purpose of the study involves describing the experiences of the students in learning mathematics in the new normal through teacher-created videos, a basic interpretive-qualitative study is suited.

The participants of the study were twenty randomly selected freshmen non-mathematics major university students from a State University in Western Visayas, Philippines. These students were taking Mathematics in the Modern World (MMW), a general education subject in the Higher Education curriculum, during the conduct of the study. Students' pseudonyms were used in the discussion of the qualitative data to ensure anonymity and confidentiality of identities. The open-ended questionnaire used in the study through google form was validated by experts. A total of eight (8) teacher-created videos ranging from 30-40 minutes per topic/video were uploaded on YouTube as instructional material in teaching mathematics during the new normal class days. Afterwards, students' experiences on the use of the teacher-created videos in learning mathematics online were documented. The students were allowed to answer in their mother tongue or native language so that they could express their thoughts better. English translations were provided in the discussion for those answers of the students based on their native languages. In addition, thematic analysis was used to analyze the data gathered in the study.

3. Results and Discussion

3.1 Students' Experiences in Learning Mathematics Online Through Teacher-created Videos

Comprehensive. The responses of the students boil down to the idea that the videos utilized in class are comprehensive learning materials. Since the videos were created by the teacher, a detailed, guided, and informative discussion was presented in the videos to make learning mathematics meaningful. The clarity of the discussion was also considered by the students as a significant part of why the videos were easy to understand. Student A stated,

"Videos gave us a better view and understanding about our lesson on math; it became our guide in easy learning the topic and finding some sort of ideas in solving the activity. And it made me/us more knowledgeable about the concept of this subject. The video became our guide and way to correct our output/ activity."

It was also validated by Student B and Student C, who cited that:

"My experience about watching videos helped me to easily understand the lesson. It's really a big help for me to analyze the problem because when the teacher is explaining through video, it gives me a clear explanation and knowledge on how the problem will be solved."

Student C:

"As I've watched the videos, my experience about it was memorable because the videos gave me a sense of excitement in answering the activities you've given. It helps me easily understand the ways on how to solve the problem."

Furthermore, the students find the videos in the material simple, comprehensive, effective, and easy to understand, as agreed by Student D and Student E. Student D further added,

"Easy and interesting sir, kasi ano sir... mahambae ko nga easy kasi kung tutuusin abi sir hay mas madali akong makaeubot kato sa video kaysa sa ginadiscuss it teacher sir..." (It was easy and interesting because actually, I can comprehend easily the video compared to the actual discussion of the teacher...).

Student E said,

"Video is very beneficial and effective educational material for me because it is comprehensible, understandable, and composed of various examples. It is good for those students who cannot easily understand and catch up on a certain topic fully like me because it gives me a chance to study it again. The efforts of putting some pictures, voice-over, and the smooth transitions of effects are also helpful in learning the discussion very well."

This resonates with the study of Ariyanti & Santoso (2021) in an online mathematics learning in which students suggested that teachers should make videos or explain material through videos for the students to better understand the lesson. Students, based on their learning experiences with the video-based e-modules in mathematics, found it to be flexible, efficient, effective, and easy to understand/use (Nabayra, 2020; Pal & Patra, 2020). Moreover, students are interested in learning that provides various formats such as the use of video, audio, or other technologies which allow students to respond efficiently (Sun & Chen, 2016). These teacher-created videos indeed embody the multimedia and modality principles of Mayer et al. (2015), which state that using any two out of the combination of audio, visuals, and text promote deeper learning than using just one or all three. Learning is more effective when visuals are accompanied by audio narration versus onscreen text.

Versatile and student-friendly. The versatility of the videos played a big part in its effectiveness as a learning material because students have control whenever they want to play and pause the videos depending on their most convenient time. It was further validated by what Student G, Student H, Student I, and Student J have said. Student G:

"I am grateful that there's a video explainer in each module. It helps me to understand the lessons well. With the advantage that we can re-watch the explainer to fully get the totality of mathematical ideas."

Student H:

"...Moreover, the videos aren't just a way to help us learn but also to boost our independence in learning. In my own stand, I have learned so many things by just simply watching the videos provided. Other than it being reliable, it also allowed each of us to learn from your discussion in our most comfortable time. The video also lessened my problem with regards to my internet connection because after I downloaded it, I can watch it until I deeply understand without spending a lot of data connection."

Student I:

"...With the help of these videos, hindi po mahirap ang umintindi sa mga lessons, masaya nga po kasi pwede naming ma pause yung may mga questions at answeran upang ma check kung nauunawaan namin yung diniscuss." (With the help of the videos, understanding the lessons seems to be easier because we can pause and answer the questions posted in some part of the videos, then play it again to check our understanding of the topic discussed).

Student J:

"Learning with videos help me understand more the lesson. It is very flexible even compared to face to face class because whenever my brain is not ready for the information, I am free to rewind and play it again."

It corroborates with the study of Kahrman (2016), who found out that other factors that students' thought enabled the videos to be effective included the videos being available on their phones so they could watch them anywhere, anytime. It is indeed suited to online learning, where flexibility is a must (Syauqi et al., 2020). With the increased use of video lessons, students might get the optimum benefits from these resources and eventually might become self-directed learners (Ozkan & Budak, 2021). It also affirms the Learner control principle of Mayer et al. (2015), which states that effective learning means learners have control of the rate at which they learn.

Virtual Presence of the Teacher. Most of the participants also shared the same idea that the videos used during their online mathematics class highlighted the virtual presence of the teacher. Some even argued that their experience is comparable to the usual face to face classroom set-up because they are still listening to the voice of the teacher while discussing the lesson. The

combination of visual and audio elements of the video through the teacher's discussion played a vital role in making this experience meaningful for the students. This is depicted in the answers of Student L, Student M, and Student N. Student L:

"Medyo malayo ang agwat ng face-to-face class sa online at modular learning. Itong videos po na ito ay magandang way for the students to learn and understand the lessons well. It's just like a normal set-up of class kung saan mayroong teacher na nag di-discuss." (There is a huge gap between face-to-face instruction and online learning. These videos are good strategies for the students to learn and understand the lessons well. It is similar to the normal face-to-face instruction wherein a teacher discusses the topic.)

Student M:

"Some courses and subjects, like Math and Science, truly need face-to-face interactions and hands-on performances that an online or modular means cannot carry out. However, when the videos were introduced to me, somehow, I felt the typical classroom vibe. I can clearly hear the voices of my instructors and vividly grasp the whole idea of the topic being discussed. The mathematical stuff is bearable to understand and feasible for us to manage our time learning."

Student N:

"Honestly speaking, videos have been great platforms that were provided in this class. Through these, it was easy for me to understand clearly the topic. My experience in watching videos felt like I was in face to face to class because there's a discussion clearly stated in the video, same as in modules. Hence I can tell that this was a big help in learning and catching up on a lesson. That's why I am grateful enough that there are videos provided in this class."

It agrees with what Kahrman (2016) have found out that the teacher's voice has been found to be an effective design feature of the tutorials for both the students and the parents. All positive comments centred on how the tutorials sounded like the teacher was talking directly to the student in a conversational style which could result in an increase in student-teacher interaction (Bergmann & Sams, 2014). Moreover, learners learn best when teachers use as varied instructional interventions as possible to provide opportunities to grasp the lesson in the most interactive and engaging multimedia instruction, like the use of videos (Eren & Ergulec, 2020). Hence, teacher-created videos make learning personalized, as reflected in the personalization principle of Mayer et al. (2015).

Fitted to New Normal Learning. Generally, the students also agreed that the videos used in online mathematics learning are fitted in the new normal way of learning because of the clear and detailed explanations, flexibility, accessibility, and built-in reflective assessment for independent learning. They also expressed the idea that this might be a good solution to the problem of how to maximize learning despite the current pressing situation. Student H narrated that :

"During this pandemic, we aren't able to attend school and be guided personally, but the educational videos you've created has become an effective solution for us who are struggling with the new normal education. Moreover, the videos aren't just a way to help us learn but also to boost our independence in learning. In my own stand, I have learned so many things by just simply watching the videos provided. Other than it being reliable, it also allowed each of us to learn from your discussion in our most comfortable time."

Student O also shared the same point,

"Learning through watching videos helps me to further understand the lesson. It gives me a clear explanation of how to solve problems. It expands the knowledge that the teacher is trying to discuss. For me, it is necessary to have videos with this new way of learning."

Student P also cited that,

"Based on my experience in learning with the videos, it helped me to understand the lesson, and it was easy to learn or gain knowledge. Even if there's a crisis that we are facing today which affected our studies, there's a solution like what we are doing today, online learning and by watching videos."

It is in consonance with the claims of Hermita et al. (2021), in which video-based learning makes teaching and learning activities more effective and efficient and creates a different ambience than the conventional classroom methods. That's why online learning can provide more control and economical in accomplishing learning activities beneficial to students (Joosten & Cusatis, 2020;

Cidral et al., 2018). This is in line with the research of Wijaya (2021) in China, which showed students use video learning during the pandemic aside from online classes. In addition, mathematics teachers have to integrate different strategies in teaching mathematics, like the use of technology-based resources (e.g. videos, math software, etc.), especially during the challenging times of the pandemic as an indicator of excellence (Nabayra & Nabayra, 2021).

4. Conclusion

In this challenging education arena spawned by the Covid-19 pandemic, the teaching and learning process was greatly affected, which does not exclude mathematics education. Educators from primary to higher education were forced to abruptly shift to online and remote learning, which exacerbated the challenges. Hence, to ensure the continuity of learning, mathematics teachers have to innovate instruction, espouse creative strategies, and design learning opportunities through technology-enabled materials like videos.

Teacher-created videos are indeed helpful for the students to reflect on their learning progress through self-assessment as one of the features of the videos, making mathematics learning flexible in terms of time and place, personalizing mathematics learning through the social presence of the teacher, simplifying mathematical concepts through comprehensive discussions, and instigating students' interests that mathematics can be fun.

Thus, education institutions, specifically the universities and colleges, should consider short term courses and professional development engagements for teachers to hone their skills in adapting to the new normal education system and in designing appropriate instructional technologies (e.g. videos, podcasts, lectures, etc.) to aid mathematics instruction in the new normal. This would empower the teachers to become effective developers of technology-based resources, which would ultimately benefit the students in enriching their experiences through meaningful online mathematics learning despite the pandemic.

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