



Transformative mathematics learning vlogs: A participatory action research in partaking in mathematical knowledge

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Abstract

The COVID-19 pandemic prompted a shift toward alternative instructional strategies, with vlogging emerging as a promising medium for enhancing educational engagement. This study investigates how vlogging can transform traditional mathematics learning by fostering interactive and learner-centered approaches. Addressing the gap in integrating vlogging as a structured pedagogical tool, the research aimed to develop and evaluate Transformative Mathematics Learning Vlogs (TMLV) for distance education. Using Participatory Action Research with six primary and sixteen secondary participants selected through purposive sampling, the study progressed through iterative phases of data collection, analysis, and interpretation. Findings revealed that TMLV supported mastery of mathematics concepts, particularly probability, fostered creativity, collaboration, technological competence, and critical thinking, and encouraged broader stakeholder engagement. The results underscore that vlogging can serve as an effective medium for transformative learning in mathematics and other disciplines, offering inclusive access to quality education. Sustained stakeholder involvement is vital for the long-term integration of such tools in educational practice.

Keywords: Collaboration; creativity; mathematics education; transformative learning; vlogging

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1. INTRODUCTION

The history of Vlogs has existed since Adam Kontras released his first video of his voyage to Los Angeles on his blog last January 2, 2000, allowing his friends and family to follow along with his quest. Digital competence is necessary in any form of education nowadays (Blanc et al., 2025). Vlogging has come a long way from Kontras' original 15-second video, which has undergone several significant development periods due to new technologies (Sanchez, 2020). In recent years, vlogs have grown in popularity, and it is obvious that during the COVID-19 pandemic, this was the most popular platform for communication, entertainment, and a source of income across the globe (Nkoala & Matsilele, 2023). This claim was supported by Chakravarty et al., (2021) and Delgado et al., (2022), who said that Vlogs were common among millennials and that they engaged in this activity for both work and leisure. In the field of education, Vlogs have been used for pedagogy by teachers, and they are prevalent in the English discipline. Likewise, literature revealed that Vlogs were used to increase students' listening, pronunciation, and conversation skills, according to qualitative research, while blogs enable users to read and produce content (Pervaiz et al., 2020; Aldukhayel, 2021).

The application of vlogs in the field of mathematics has been met with considerable skepticism, and existing scholarly work on their integration into mathematics education remains notably limited. Nevertheless, Batilantes (2021) and Mason et al. (2022) implemented vlogs to address learning competencies that were either underdeveloped or had not been explicitly taught. Their initiative, referred to as Project VLOGI (Video Lectures on Giving Instructions), was executed within a quantitative research framework. In order to achieve a more comprehensive understanding of Project VLOGI, the present researcher employed a qualitative methodology to investigate its pedagogical benefits, subsequently adapting the intervention into what is termed Transformative Mathematics Learning Vlogs (TMLV). This adaptation sought to reconceptualize the predominant learning modality in the country, namely the printed student learning module (SLM). The researcher, therefore, considered it both timely and necessary to undertake and disseminate this study on a global scale, thereby contributing to the body of literature concerning the use of vlogs as instructional tools in mathematics. In this context, TMLV was employed to facilitate a more nuanced and critical understanding of educational video content within the vlogging paradigm (Delgado et al., 2022; Noetel et al., 2021; Chan et al., 2021).

1.1. Purpose of study

This study aims to explore the potential of vlogging as a structured pedagogical tool for enhancing mathematics learning in distance education. Specifically, it seeks to develop and evaluate Transformative Mathematics Learning Vlogs (TMLV) to promote interactive, learner-centered approaches that improve mastery of concepts, foster creativity, collaboration, technological competence, and critical thinking, and engage diverse stakeholders in the educational process. Specifically, the researcher sought to answer the following research questions.

1. What are the least learned and untaught competencies in mathematics eighth that transformative mathematics learning vlogs may apply to?
2. How does a transformative mathematics learning vlog change the learning behaviour of eighth-grade learners?
3. What transformational plan of action is implemented to promote the long-term sustainability of these transformative mathematics learning vlogs?

2. METHODS AND MATERIALS

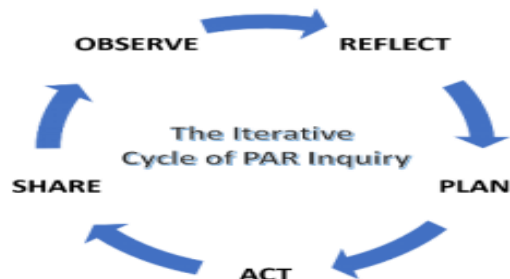
2.1. Research design

The study was grounded in Mezirow's (2015) transformative learning theory, which emphasizes meaningful, practical, and constructive learning that goes beyond the mere acquisition of information. This framework advocates for intentional meaning-making in ways that are both critical and constructive.

The research employed Participatory Action Research (PAR) as its overarching methodological framework, guided by the five elements of the PAR cycle (figure 1): observe, reflect, plan, act, and share (Crane & O'Regan, 2010; Loewenson et al., 2014). The central intervention was the implementation of Transformative Mathematics Learning Vlogs (TMLV) to address identified least-acquired competencies in Mathematics 8. This approach was also situated within the pedagogical context of vlogging as an instructional medium and aligned with the Department of Science and Technology – Science Education Institute's (DOST-SEI) STAR program, the Department of Education's Basic Education Research Agenda (BESRA), and the MATATAG program.

Figure 1

Five elements of the par cycle



The study proceeded through three iterative PAR cycles:

Cycle 1: Identify the least-learned competencies in Mathematics 8 where the TMLV could be applied.

Cycle 2: Explore the process of transforming mathematics learning behaviors among Grade 8 learners through TMLV.

Cycle 3: Develop an action plan to promote the sustainable integration of TMLV into mathematics instruction.

2.2. Participants

This Participatory Action Research (PAR) study involved two groups of participants. The primary research participants (also referred to as co-researchers) consisted of six individuals who actively engaged in all phases of the PAR cycle. They were selected through purposive sampling based on predefined inclusion criteria. The secondary research participants comprised 16 individuals who served as sources of supplementary data, participating only when their presence was necessary to address specific aspects of the study.

2.3. Data collection tools

Multiple instruments were used for data gathering, including:

- Researchers' guide questionnaire – used for live interviews and focus group discussions (FGDs).
- Observation checklists – used for systematic documentation during participant observation.

Both instruments underwent validity and reliability testing to ensure accuracy, consistency, and freedom from bias in data collection.

2.4. Data analysis technique

Data were collected through live interviews, FGDs, and participant observation across three PAR cycles. Qualitative data were analyzed iteratively within each cycle, guided by the five elements of PAR. Observations and participant reflections were coded and thematically analyzed to identify emerging patterns, inform subsequent actions, and refine the TMLV implementation. The cyclical structure ensured continuous reflection, adaptation, and co-construction of knowledge with participants..

The data-gathering procedure was composed of three (3) iterative cycles of inquiry utilizing the five (5) elements of PAR (Crane & O'Regan, 2010; Loewenson et al., 2014) as seen in Figure 1.

3. RESULTS

After the sources of data were collected, collated, analyzed, and interpreted from transcription and coding, the generated themes evolved based on the collaborative contributions among primary participants. The following results are shown in Tables 1 to 3. Table 1 is the answer to research question no. 1.

Table 1

The mathematics least learned competencies that TMLV should apply

Significant Statements	Minor Themes	Major Themes
"As a subject teacher teaching in mathematics 8, I was unable to achieve the learning skills in the last section of the curriculum guide." [T1]	Untaught Learning Competencies	Fostering Probability Topics in Grade 8 Mathematics
"Probability was not taught to us in grade 7. However, there were topics on the Grade 7 module." [S1]	Inconsistency of Learning Competency	
"Probability was in the learning competencies before grade 7. However, it was lifted now in grade 8." [T3]	Bewildered Information	
"I had a hard time studying problem solving that involves probability." [S2]	Probability Word Problem Solving Difficulty	

Note: [S1 & S2] – Student Participants; [T1 & T3] – Teacher Participants.

According to the responses of the study participants, the majority of the learning competencies that were not completely mastered by grade 8 learners were found near the end of the mathematics 8 curriculum guide.

"Actually, in my more than ten years of service, I have not yet completed teaching all of the learning competencies in Mathematics to my students. These were due to unavoidable circumstances such as typhoons, fires, floods, and even the COVID-19 pandemic. Local holidays and various ancillary services at school and in the community also hindered the attainment of this objective". [T1]

Table 2 is the answer to the research question. 2.

Table 2

The essence of TMLV in transforming student traditional learning

Significant Statements	Minor Themes	Major Themes
" Vlogs enable students to acquire knowledge at their own pace and in their own time." [T2]	Distance Learning	The Soul of Transformative Mathematics Learning Vlogs
"Creating Vlogs was fun and enjoyable, but we are also learning." [S4]	Interactive Educational Vlogs	
"I think I improved not only my mathematical skills but also the other aspects that I had, like speaking and communicating through acting on camera." [S7]	Multidisciplinary Engagement for Learning	
"It was evident that TMLV demonstrated knowledge and expertise since students were engaged in developing such TMLV. Moreover, TMLV fosters the 21st-century skills of the learners." [T5]	Learning by Doing	

Note: [S4 & S7] – Student Participants; [T2 & T5] – Teacher Participants.

The aforementioned statements and themes created in phase 2 of the research had a positive impact not only on the students but also on the teachers. One student participant shared her statement.

"TMLV was an avenue for me to show my hidden talents in acting. As I watched myself on screen discussing the topics about probability, I could say that I am also comparable to some vloggers that I could see online. I had so much fun with it and at the same time learning about the subjects and making more friends, making such vlogs". [S5]

Table 3 is the answer to research question no. 3.

Table 3

The Plans of Action to Promote Sustainability of the TMLV

Significant Statements	Minor Themes	Major Themes
"I would prefer to include this as one of the topics in our LAC session so that all teachers are aware of it and may consider using it for a student project." [P1]	School-Based LAC Session	
"I believe it would be great if you could present this in our District INSET so that the scope of dissemination is not limited to the school level." [T3]	District In-Service for Teachers (INSET) Training and Seminars	
"If given the opportunity, I could present and discuss this to our Local Government Unit (LGU) for funding so that we could produce TMLVs that were quality assured by some experts to be utilized here by Malaynon learners." [T1]	Local Government Unit Support	Encouraging Stakeholders Support
"Yes, you may publish it in our Division LRMDs or other reputable national and international journals." [T4]	Journal Article Publication	

Legend: [P1] – School Principal; [T3, T1 & T4] – Teacher Participants.

Based on the aforementioned views and the FGD in this study, one of the participants shared.

"As I listened to the dialogues, I could affirm that the benefits of TMLV may improve our learners and at the same time teachers in improving the mathematical skills in probability. I am referring here not just to the concepts that they had acquired in using TMLV, but they will apply these concepts in actions or in real situations for them to understand them better. So, I would suggest that this TMLV be disseminated across the district, with Malaynon students and teachers serving as the pioneers in implementing this initiative. Kudos to this project". [P1]

4. DISCUSSION

Vlogs are widely utilized across all social media platforms, both in the Philippines and internationally. The majority of users employ this medium for leisure and income generation (Torhonen et al., 2020). In contrast, Batilantes (2021) integrated vlogs into mathematics instruction. The Transformative Mathematics Learning through Vlogging (TMLV) approach served as the qualitative counterpart of Project VLOGI (Batilantes, 2021), which was grounded in Transformative Learning Theory (TLT) to interpret the learning vlogs produced and to transform learners' behavior toward the mathematics teaching and learning process.

The findings indicated that TMLV, within the context of vlogging, can foster positive learning behaviors in mathematics instruction while simultaneously developing twenty-first-century skills such as creativity, collaboration, technological competence, and critical thinking. Similar to the observations of Campbell et al. (2022), student-created videos provided active learning experiences that enhanced perceived STEM content knowledge, strengthened self-efficacy, and demonstrated behavioral, emotional, and cognitive indicators of student engagement.

TMLV was considered a distinctive approach to mathematics learning because students who appeared in the videos acted as facilitators of learning while simultaneously acquiring learning experiences through vlog creation. This approach was characterized as transformational learning, as the traditional instructional process was restructured into an innovative and beneficial method aligned with technological trends and learners' interest in incorporating technology into lessons. This perspective is supported by Nicolaou et al. (2019), who noted that video is a medium that effectively captures audience attention and increases engagement, making it suitable for a wide range of educational levels and disciplines with diverse needs.

The final major theme identified, stakeholder support, was recognized as essential for ensuring the sustainable development of TMLV in the future. In October 2022, the project was launched, implemented, and mobilized at the district level to disseminate significant findings to other teacher-researchers and

prospective student vloggers who could serve as facilitators of learning through vlogs. Efforts are underway to publish this study in a refereed international journal to ensure accessibility to the wider research community, both within and beyond the Philippines..

5. CONCLUSION

This study provides conclusions and outlines the implications of Transformative Mathematics Learning Vlogs (TMLV) in reshaping conventional mathematics learning and promoting its sustainable application in education. The implications are as follows:

- Transformative Mathematics Learning Vlogs (TMLV), grounded in Transformative Learning Theory (TLT), demonstrated the capacity to convert traditional mathematics instructional methods into more engaging approaches aligned with the interests and preferences of millennial learners.
- Although limited to mathematics instruction, the approach is considered adaptable for other subject areas through the integration of vlogs as a medium for delivering learning content to target audiences.
- Future research is planned within the framework of a grounded theory approach to develop the Transformative Mathematics Learning Vlogs Theory (TMLVT) by incorporating TLT alongside other relevant theoretical perspectives.
- Support from diverse stakeholders, including students, parents, teachers, and school leaders (internal stakeholders), as well as public school district supervisors, division offices, and local government units (external stakeholders), is deemed critical for ensuring broader accessibility of TMLV beyond Malaynon learners to other learning communities.

The findings strongly recommend the integration of TMLV into mathematics instruction. Teachers in other disciplines are encouraged to adopt this approach, as contemporary learners exhibit a preference for educational experiences enriched with information and communication technology rather than conventional modes of instruction. Researchers seeking to expand the scope of inquiry are advised to retain the vlog-based instructional context.

The combination of Project VLOGI, employing a quantitative inquiry approach, and TMLV, employing a qualitative inquiry approach, produced a significant pedagogical impact on mathematics instruction in the context of vlogging. While each approach utilized distinct methodologies, both shared the objective of transforming conventional mathematics teaching in varied learning environments. Traditional settings, such as lectures using chalk and blackboards, as well as pandemic-era modalities like printed self-learning modules (SLMs), can incorporate vlog videos as supplementary instructional resources. These resources hold potential not only in mathematics but also in other academic disciplines.

The approach, in which students assume the role of primary presenters and facilitators of mathematical concepts, offers potential benefits for learners. This instructional strategy is expected to enhance mathematics proficiency while simultaneously fostering comprehensive twenty-first-century skills. Given the demographic composition of the current student population, characterized predominantly by millennial learners, the intervention is considered both timely and valuable.

Ethical Approval: After the school principal gave the researcher permission to conduct a study among students and teachers at Malay National High School in Motag, Malay, Aklan, the researcher used the study's consent form for the research participants. The consent form included the participants' ethical approval, the research's terms and conditions, the anonymity of the participants' names, the secrecy of the findings, the dangers, and the advantages they would get from the study. All of these were considered in order to preserve study participants' rights, improve research validity, and maintain scientific integrity.

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