IMPROVING STUDENTS' CONCEPTUAL UNDERSTANDING IN MATHEMATICS THROUGH VLOGGING

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ABSTRACT: *This quasi-experimental study sheds light on one of the new normal strategies to teach mathematics in high school during the pandemic. It investigated the effect of vlogging as a learning method. A 7-item teacher-made test was used to quantify students' conceptual understanding. Thirty (30) respondents who were subjected to self-learning printed modules were in the control group, and another thirty (30) respondents who were subjected to vlogging comprised the experimental group. Results showed that vlogging produce higher conceptual understanding among students than the printed modular approach. It is recommended that in teaching Statistics and Probability, teachers may consider vlogging to develop profound understanding in mathematical concepts among students as alternative to printed modular learning.*

Keywords: vlogging, conceptual understanding, new normal, pandemic, printed modular learning

1. INTRODUCTION

Education initiative in the new normal setting is catalyzing the advent of technology through the use of computer-generated modalities like vlogging. Vlogging is characterized as creating an online broadcast with content for a particular subject that serves as a vehicle of communication [1]. This modality brought the impact in learning where the learners are challenged, particularly on the effect of teaching strategies in distance learning.

Additionally, when an unprecedented incident happened due to coronavirus disease, the hasty modification in teaching and learning is being materialized. The Covid-19 pandemic poses a greater challenge in teaching and learning. More so, the Department of Education (DepEd) in the Philippines has set forth the implementation of the new normal set-up of education through its learning continuity plan including technology integration. Magsambol[2] noted the importance of continuing education to measure the learning outcomes and performance tasks of the students.

Moreover, DepEd has provided several alternatives to tailor the needs of the students amid these extraordinary times. Accordingly, learning modalities include modular, television-based, radio-based instruction, blended, and bichronous approaches [3]. On the other hand, challenges are still perceptible in the implementation of the said modalities, particularly to those demotivated to learn in mathematics subject.

Similarly, Magayon and Tan's [4] study, suggested to consider activities based on students' preference, modified learning activities, variety of assistance provided to students during activities, and variety of relating real-life situations. Conceptual ideas are not built one day or even two. They are developed after repeated exposure to a particular mathematical idea in various contexts [5].

In the context of conceptual understanding in distance learning, it is believed that there are still a lot of students who lack understanding of variables and equality [6]. This means that there should be a deliberate effort on the part of the teacher to connect concepts learned in their previous study to the current study of the subject matter.

Over the last two international assessments that the Philippines took part in, the Programme for International Student Assessment 2018 (PISA) and Trends in International Mathematics and Science Study 2019 (TIMMS), Philippines consistently ranked low, if not the lowest, in Mathematics. Both international assessments measured student's proficiency in math through applying conceptual understanding to solve problems.

Dabbagh and Kitsantas's[7]study opined that the desired learning outcomes are met when students are given a self-oriented system by their teacher. Students retained concepts and knowledge when they utilized vlogs [8].

More so, this adjustment sheds light the opportunities in venturing a task-based learning like vlogging as one of the strategies in distance teaching and learning. By supporting vlog with a sophisticated vlogging stages and a proper scoring reflection as feedback, Maulidah[1] added that it is expected to improve students' ability. Through vlogging, students will be enticed to learn with image or video. Videos are bridging the gap for informing, educating, engaging, entertaining and socializing [9]. In the field test, vlogging was successful in improving students' learning enthusiasm [10]. With capabilities of digital videos, students should no longer be expected to learn mathematical concepts and process only by sitting and listening to long explanations [11].

This study was conducted to look into the effectiveness of vlogging for students' conceptual understanding in mathematics in the new-normal set-up of Angeles Sisters National High School (ASNHS). It specifically tried to assess the performance of students in conceptual understanding through vlogging.

Given the premises stated above, the present study utilized vlogging as a modality of learning under digital modular learning as contrary to self-learning printed modules, which was practiced by ASNHS to quantify its effect to the students' conceptual understanding in Statistics and Probability. Additionally, since there is a shortage of strong study on the relationship of vlog in mathematics, the present study would like to fill in the gap.

2. Literature Review

The Digital 2019: Global Digital Overview showed 99% of Filipino internet users watch videos and the top google search for queries in 2018 uses YouTube as platform. In today's classroom, teachers have more tools to help students understand mathematical concepts and a balanced of traditional and modern methods of teaching can help students of all abilities [12].

In general, schools have been utilizing technology-based learning activities[13].Social media has a positive role towards

improved understanding of multiple representations and creativity of learners[14]. On one hand, the use of technology as a creative assessment tool (vlog creation)used reflective cycle (feedbacking) to evaluate vlog's relationship to a student's deep learning, affective learning and the development of digital literacy [15].Video blogging serves as an avenue for the students to express their understanding of the content[16].Project vidu math summarizes that learners are more likely to retain concepts and knowledge discovered on their own [17].

Vlog helps students to understand the materials, improve students' learning achievement, motivation, creativity, and engagement, provide interesting learning activities, efficient learning, effective learning, and lead students to be confident, independent and critical[18].To help the Filipino teachers cope with the herculean demands of this digital shift, several initiatives have surfaced with education channels on YouTube, complete with recorded lesson and other tips[19]. Additionally, the effective use of video as an educational tool is enhanced when teachers consider three elements: how to manage cognitive load of the video; how to maximize student engagement with the video; and how to promote active learning from the video [20]. Here, the vlog intended for the students would run only at least five (5) minutes.

Based on the aforementioned related studies on vlogging, it can be inferred that educational vlogging are becoming increasingly interesting. This claim has direct bearing to the present study as it involves on the concepts in teaching and learning in the new normal set-up. In the field of mathematics, it is deemed to be functional to engage the learners in addressing the challenges brought by the unprecedented phenomenon.

3. Material and Methods

This study used quasi-experimental research design in determining the effectiveness of vlogging to student's conceptual understanding. This study was conducted at Angeles Sisters National High School, Consolacion, Cagayan de Oro City, formerly known as Consolacion National High School under the supervision of Department of Education, Division of Cagayan de Oro City.

The participants involved in the study were the students enrolled in Statistics and Probability in the first quarter of the second semester of the school year 2020-2021. A total of 60 students served as the participants of the study.

Due to the potentially invasive nature of vlogging, student-participants are ensured confidentiality by having all data in codes. The code E indicates a student-participant from the experimental group while code C indicates a student-participant from the control group. All videos submitted can be viewed by the teacher-researcher only. A Consent and Waiver form was also filled out by the parents of the participants in the experimental group.

The researcher used survey questionnaires and a teacher-made test to collect data. To measure students' conceptual understanding, the researcher made a questionnaire about Statistics and Probability composed of 7 open-ended questions which were validated by mathematics teachers and advisers. Each question is worth ten points, and rated using a rubric.

The control group utilized modular learning, specifically self-learning printed modules, as practiced by the school. On the other hand, the experimental group used vlogging. The teacher provided the outline of the topics in relation to DepEd's Most Essential Learning Competencies (MELCs) for the subject Statistics and Probability. The researcher also provided the rubric for grading the vlog.

The course Statistics and Probability is composed of two (2) modules. Each module is composed of 10 weekly activities, meaning each module is to be done within 10 weeks. This study was implemented for the first module of the course, which translates to 10-week duration.

For the experimental group, they created a vlog for every MELC (Most Essential Learning Competency). There are 10 MELCs for the subject thus, one video per week were submitted for the same 10-week duration.

After the first module, the teacher conducted an assessment to students' conceptual understanding using the researcher-made test. The test was composed of seven questions. After gathering the data, these were subjected to t-test to see if there is a significant difference on the students' conceptual understanding between the two groups.

4. Results and Discussion

Table 1 illustrates the mean and standard deviation between the group's conceptual understanding scores in Statistics and Probability.

Table 1.Level of Learner's Conceptual Understanding

Variable	N	Mean	SD	Interpretation
Control Group (C)	30	34.9	1.85	Fairly Satisfactory
Experimental Group (E)	30	47.3	2.09	Satisfactory

This result indicates that the students from both groups had similar variability with the experimental group higher by only 0.24. A 'fairly satisfactory' level understanding of facts and ideas in Statistics and Probability was seen with the control group with the mean of 34.9. On the other hand, those in the experimental group has a 'satisfactory' level;thus, a new challenge is to look for the teaching ways that can address their needs to respond to such diverse needs of the students, different innovative teaching and differentiated strategies and methods should be used by the teachers in their classes [21]. Scores from the experimental group has a higher mean of 47.3 compared to the control group that has a mean 34.9 hence, effective innovative teaching strategy is deemed essential to establish.

Table 2 tests the difference between conceptual understanding scores and teaching methods as to self-learning modules and vlogging. The result in this present study implied that the learning modality in terms of self-learning modules and vlogging shows **Significant Difference** to the result of conceptual understanding of students with the computed t-value (t= -2.63) as indicated by the probability value (p= 0.010). This result implies that vlogging as learning modality in contrast to self-learning printed modules is effective in

improving the conceptual understanding of the students in Statistics and Probability,

Table 2. T-test on the Difference between Conceptual Understanding of Students

Teaching Methods based on:	Conceptual Understanding		
	t-value	p-value	Interpretation
Self-Learning Moduleand Vlogging	-2.63	0.010	Significant

**significant at 0.05 level*

Table 4 shows the result of the test of difference between conceptual understanding of students as to self-learning printed modules and students making vlog as their output. This means that the conceptual understanding of students and the methods of teaching whether modular or vlogging are not the same. The contextual learning strategy as seen from the experimental group significantly affected the conceptual understanding and the ability to solve problems in mathematics subjects as the same result from Jazuli, Setyosari&Kuswandi's study [22]. It is important to note that mathematics teachers should incorporate vlogging as a strategy that best suited to the level and interest of the students. Therefore, the result in this present study implied that the null hypothesis was rejected as the students' conceptual understanding scores, self-learning printed modules, and vlogging were all found to have a significant difference.

5. Conclusion

Teaching mathematics in the new normal through modular learning (self-learning printed modules) and digital learning (vlogging) had a significant difference with the conceptual understanding of the students in learning Statistics and Probability. Henceforth, the conceptual understanding of students is better when vlogging is used. Teachers, particularly Math teachers, are recommended to use vlogging as part of their innovative teaching strategies in the new normal set-up. Future Researches are recommended to widen the scope in studying mathematics learning competencies. It is suggested to investigate common factors affecting the interest of students in learning mathematics subject as not all students are interested in vlogging,

6. References

[1] Maulidah, I. (2017). Vlog: the Mean to Improve Students' Speaking Ability. Retrieved from https://www.atlantis-press.com/proceedings/iconelt-17/25888972

[2]Magsambol B (2020, September 9) 'Ill-informed': DepEd dismisses calls for academic freeze. https://www.rappler.com/

[3] Department of Education (2020, October 1). DepEd to showcase readiness in School Year 2020-2021 kick-off. https://www.deped.gov.ph/

[4] Magayon, V.C. & Tan, E.B. (2016). Learning mathematics and differentiated instruction in the Philippines: A phenomenographical study on struggles and successes of grade 7 students. International Journal of Educational Studies in Mathematics,3 (3), 1-14.

[5] Morey, C. (2016). 5 Tips to Help Develop Conceptual Understanding in Math. Retrieved on October 29, 2021 from: https://www.teachingchannel.com/blog/develop-conceptual-understanding-math

[6] Tan, C. &Lapinid, M.R.C. (2013). High School Students' Conceptual Understanding of Variables and Equality. Research Congress 2013 De La Salle University Manila.

[7] Dabbagh N.A., Kitsantas A.B., (2012). Personal Learning Environments, socialmedia, and self-regulated learning: A natural formula for connecting formal and informal learning. Internet and Higher Education 15 (2012) 3–8

[8] Lawrie, G.A., & Bartle, E.B. (2013). Chemistry Vlogs: A vehicle for student generated representations and explanations to scaffold their understanding of structure-property relationships. International Journal of Innovation in Science and Mathematics Education, 21(4), 27-45.

[9] Glickman, D. (2020). Adapting to the New Normal: Video Content Strategy after COVID-19. Retrieved on October 29, 2021 from:https://www.clickz.com/author/daniel-glickman/.

[10] Darmawan, R. (2016). The Development of VloggingAs Learning Media to Improve Student's Learning Enthusiasm in Class Xii on Myob Manufacture (Debt Card) Material Smk N 2 Purworejo Academic Year 2015/2016. Undergraduate Thesis. Yogyakarta State University.

[11] Niess, M. & Walker, J.M. (2010). Guest Editorial: Digital Videos as Tools for Learning Mathematics. Contemporary Issues in Technology and Teacher Education. Retrieved on October 29, 2021 from: https://citejournal.org/volume-10/issue.

[12]Capuno, R., Revalde, H., Etcuban, J.O., Aventuna, M., Medio, G. & Demeterio,

R.A. (2019). Facilitating learning mathematics through the use ofinstructional media. International Electronic Journal of MathematicsEducation e-issn: 1306-3030. 2019, vol. 14, no. 3, 677-688.

[13] Gumala, Y. (2016). Video-Based Blogging in Learning (Vlog) to Develop theInteraction of Teachers And Students. Proceeding of the international seminar on philosophy of education: Primary Foundation in Strengthening Pedagogy Development in Indonesia Future Generationp215

[14] Sahara R., Irwansyah F. S., Ramdhani M.A., &Darmalaksana w., (2018). Utilization of Social Media Vlog to Enhance Creativity Students in Project Based Learning. Advances inSocial Science, Education and Humanities Research, volume 260Indonesia: Atlantis Press.

[15] Van den Berg, L. (2020). 4th Industrial Revolution?Ready, Tech, Go: Reflecting on Sport Students' Digital Literacy Skills when Creating Vlogs for Assessment. In Proceedings of EdMedia + Innovate Learning (pp. 272-291). Online, TheNetherlands: Association for the Advancement of Computing in Education(AACE). Retrievedfrom

https://www.learntechlib.org/primary/p/217313/.

[16] DeMara, R., Salehi, S. &Muttinenti, S. (2016). Exam Preparation through DirectedVideo Blogging and Electronically-Mediated Realtime Classroom Interaction. In Chen, B., deNoyelles, A., & Thompson, K. (Eds.), Teaching Online Pedagogical Repository. Orlando, FL: University of

Central Florida Center for Distributed Learning. Retrieved October 16, 2019, from http://topr.online.ucf.edu/exam-preparation-through-directed-video-blogging-and-electronically-mediated-realtime-classroom-interaction./

[17] Thiel, O.,Hottmann, A., Jessat, M., Loviscach,J., Vaienti, D., Vaz, P., Kostova, N., &Josephson, J. (2017). vidumath - creative video for mathematics booklet.10.13140/RG.2.2.15131.98080

[18] Mandasari, B. &Aminatun, D. (2019). Uncovering students' attitude toward vlogging activities in improving students' speaking ability. premise: Journal of English Education

[19] Joven, J. (2020). 3 YouTube Channels That Can Help Filipino Teachers With E Learning. Retrieved on October 29, 2021 from: https://cnnphilippines.com/life/culture/tech/2020/9/25/youtube-channels-filipino-teachers.html.

[20] Brame C. J. (2016). Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. CBE life sciences education, 15(4), es6. https://doi.org/10.1187/cbe.16-03-0125

[21] Naz, F., &Murad, H. S. (2017). Innovative Teaching Has a Positive Impact on thePerformance of Diverse Students. SAGEOpen. https://doi.org/10.1177/2158244017734022

[22] Jazuli, A.,Setyosari, S.&Kuswandi, D. (2017). Improving Conceptual Understandingand Problem-Solving In Mathematics through A Contextual Learning Strategy. Global Journal of Engineering Education. Volume 19, Number 1.