BLENDED LEARNING OF MATHEMATICS DURING COVID19 PANDEMIC, BUSITEMA UNIVERSITY, TORORO DISTRICT, UGANDA, A CASE STUDY AT NAGONGERA CAMPUS.

By

OCHIENG GEORGE WILLIAM (BSc. Ed…, Student)

REG.NO: BU/UP/2019/1539

A Research Report Submitted in the Department of Mathematics

to the Faculty of Science Education in the Partial Fulfillment

of the Award of Bachelor of Science Education of

Busitema University

May 2023

DECLARATION

I, **Ochieng George William**, hereby declare that is report is my original work and has never been presented to any university, college or institution for award of a diploma or degree.

Signature.....Date.....4/5/2023.....

Ochieng George William

APPROVAL

This report has been submitted for examination with approval of the supervisor

Signature.....**Date**.....04/05/2023.

Ms. Nabirye Topista

DEDICATION

To my dear father Nikee Nicholas Oketcho, my loving mother Achieng Sarah, my beloved wife Awor Margret, my brother Opendi Michael, my sisters Amali Veronica, Nyamwenge Mary, Nyawere Jane Francis and Achieng Tereza, my friends Baseke Francis, Sanya Moses, Kyotalye Brain, Owor Peter Opio, and the entire Adhola fraternity at Busitema university Nagongera campus. You have always inspired me, positively reinforced me and helped pursue excellence. I thank all of you for your support towards my academic achievement. For it is through Education that we can change our communities and give support to the needy.

ACKNOWLEDGEMENTS

I thank the almighty God, for having helped me finish my research study which is a great achievement in my academic endeavours. I want to humbly appreciate Ms. Nabirye Topista for guiding me through my research proposal and helping me to accomplish my research report. I greatly honor you for the wonderful work done to enable me achieve excellence. I appreciate you for the professional conversations and your ability to challenge me so as to keep moving forward. And my lecturers Dr. Mwasa Abubakar, Dr Asaph Muhumuza, Dr Rebecca Nalule, Dr kyomuhangi Annet, Mr. Okiring Jackson, Dr. Kadedesya Stephen and Dr. Nanyondo Josephine being inspirational tutors of mathematics throughout the course of bachelors of science and education.

Abstract:

The outbreak of covid-19 pandemic resulted into closure of schools including higher institutions of learning in Uganda. This made most institutions including Busitema university to adopt blended learning approach to teaching/learning process. This kind of learning was new to most students and therefore was not easily adopted by students of Busitema University at Nagongera campus since it was their first to use Zoom for online learning especially in Mathematics class. Most students were used to face-to-face lectures whereas during online lectures, they could campaign to the lectures. It seemed that they were some difficulties on how to use Zoom which called for a comprehensive study. This study assessed the responses of third year students of mathematics class of Nagongera campus on the effectiveness of blended learning based on Zoom online platform, like/dislike of zoom and blended learning, challenges students faced in blended learning during covid-19 pandemic era and gave the suggested solutions to the challenges. This research included surveying and describing the responses of 50 third year mathematics students of faculty of science and education at Nagongera campus. Responses were obtained by questionnaire method and the results were further collected, sorted and categorized on tables. My finding reveals that zoom was disliked by 68% of the sample population and as a result making blended learning of mathematics a dislike to about 64% of the students. This was as a result of several challenges the students during zoom lectures such as poor internet, high rate of data consumption, lack of training among others. The like/ dislike of Zoom and blended learning was compared using two-way Anova as in the results and discussions. On effectiveness of Zoom for online lectures, 4% of the sample population said that it works effectively,8% said that zoom works effectively, 24% less effectively , majority said that zoom was not effective for online learning of mathematics since it consumes a lot of data and also requires good internet within an area whereas 6% said that they totally dislike zoom since it was very ineffective. They further explained that this made blended learning especially online lectures to be less effective. According to general analysis, about 70% of the sample population would like to use traditional face-to-face method of learning mathematics, 5% wanted online lectures and 25% needed blended learning of mathematics courses. Also, on the challenges faced during blended learning, 42% of study population faced poor internet coverage, 18% lacked power, 10% lacked devices which were needed for online lectures,24% lacked data and 6% responded that there was shortage of seats and buildings during face- to -face interactions and the suggested solutions were given on results and discussions. According the results obtained, the use of blended learning requires an online learning platform which attract students'

attention and also motivational especially 0n teaching and learning of mathematics courses. This will enable students to solve challenges they faced such as low motivation and this would later improve on their performance in Mathematics.

Table of Contents

CHAPTER 1; INTRODUCTION

1.1 Back ground

Cov-2-virus(Covid-19) is a pandemic disease which was first reported in China and it spread rapidly to many countries including Uganda. This caused many impacts in Ugandan economy including Education sector. Since Covid-19 entered Uganda in mid-March of the year 2020, various schools, campuses, and educational institutions have implemented Blended learning policies to ensure the continuity of their teaching and learning process. The existence of the Covid-19 pandemic is forcing us to move faster in terms of learning innovation, especially technology-based learning. Technology that continues to develop along with the increasing age and human needs, of course, increasingly demanding people to be more creative in creating more sophisticated technologies. The progress of science and technology today, is inseparable from the role of mathematics as a basic science. Mathematics also has strategic values in developing ways of thinking logically, being critical, creative and innovative as well as being able to be applied in various problems both related to students' daily lives and with another knowledge. Research exclusively focusing on global pandemics and digital learning Covid-19 is on the rise in 2020. Some researchers have conducted studies on the knowledge needed for the adoption of digital technology during the Covid-19 crisis(Ahmad, Dian, & Barra, 2020). For example, according to(Agnoletto & Queiroz, 2020; R. Agnoletto & V. C. Queiroz, 2020), in their paper Covid-19 and challenges in Education, they argue that digital logic is not simple but there are ongoing protests to launch emergency action tools, mostly, adopting the use of digital technology for learning. While a study by Roy (2020) in Australia, presents some tips that can help children learn from home during the Covid-19 period. In one of the tips, he suggested that teachers need to download several teleconferencing facilities (e.g., Skype, Zoom, Lifesize) that can be used to deliver lessons remotely(Mulenga & Marban, 2020). The existence of the Covid-19 pandemic has made all learning activities in Uganda that used to be face-to-face learning turned into online learning. Baytiyeh (2019), believes that maintaining learning and communication during school closure by all possible means is important(Mulenga & Marban, 2020). In support of this claim Burke (2020), strongly points out that in an effort to reshape education, there are certain steps that need to be implemented during the Covid-19 school closure period. These

References.

Adiguzel, T., Kamit, T., & Ertas, B. (2020). *Teaching and learning experiences with enhanced books in engineering math and science courses* (11 ed. Vol. 2).

Agnoletto, & Queiroz. (2020). Covid-19 and The challenges in Education. *CEST (Bulliton), 5*(2), 1-2.

Agnoletto, R., & Queiroz, V. C. (2020). Covid-19 and The challenges in Education. *CEST (Bulliton), 5*(2), 1-2.

Agus, I., & Amanda, L. H. (2020). The Responses of Mathematis Pre-service Teachers Toward Online Lectures in the Covid-19 Era. *EDUMATIKA: Journal Riset Pendidikan Matematika, 3*(2).

Ahmad, F., Dian, N., & Barra, P. P. (2020). Blended learning model during the Covid-19 pandemic:Analysis of Students' Mathematical Disposition. *JTAM (Journal Teori Aplikasi Matematika)*.

Alammary, A. (2019). Blended learning models for introductory programming courses: A systematic review. *PLoS ONE, 14*(9).

Attard, C., & Homes, K. (2020). An exploration of teacher and student perceptions of blended learning in four secondary mathematics classrooms. *Math Ed Res J*, 1-22.

Balakrishnan, A., Nair, S., Kunhikatta, V., Rashid, M., Unnikrishnan, M. K., & Jagannathat, P. (2021). Effectiveness of blended learning in pharmacy education: An experimental study using clinical research modules. *PLoS ONE, 16*(9).

Balentyne, P., & Varga, M. A. (2017). Attitudes and achievement in a self-paced blended mathematics course. *Journal of Online Learning Research, 3*(1), 55-72.

Barros, A. P. R. M. D., Simmt, E., & Maltempi, M. V. (2017). Understanding a Brazilian high school blended learning environment from the perspective of complex systems. *Journal of Online Learning Research, 3*(1), 73-101.

Boelens, R., Wever, D. B., & Voet, M. (2017). *Four key challenges to the design of blended learning* (Vol. 22).

Dempsey, M., & Burke, J. (2020). Covid-19 Practice in Primary Shools in Ireland Report: A Two-month Follow-up.

Jeffrey, L. M., Milne, J., Suddaby, G., & Higgins, A. (2014). Blended learning: How teachers balance the blend of online and classroom components. *Journal of Information Technology Education, 13*, 121-140.

Kashefi, H., Ismail, Z., & Yusof, Y. M. (2017). Integrating Mathematics Thinking and Creative Problem Solving in Engineering Mathematics Blended learning. *Sains Humanika, 9*, 1-2.

Kerzic, D., Tomazevic, N., Aristovnik, A., & Umek, L. (2019). Eploring critical factors of the perceived usefulness of blended learning for higher educaton students . *PLoS ONE, 14*(11).

Lin, Y.-W., Tseng, C.-L., & Chiang, P.-j. (2015). The effect of blended learning in Mathematics Course. *EURASSIA Journal of mathematics, Science and Technology Education*.

Lin, Y.-W., Tseng, C.-L., & Chiang, P.-j. (2017). The effect of blended learning in Mathematics Course. *Eurasia Journal of mathematics, Science and Technology Education, 13*(3), 741-770.

Miyaji, I., & Fukui, H. (2020). Change of knowledge and awareness in teacher education on Satoyama environmental learning: Through a blended learning spaces ,methods and media. *European Journal of Educational Research, 9*(4), 1663-1674.

Mulenga, E. M., & Marban, J. M. (2020). Is Covid-19 the Getway for Digital Learning in Mathematics Education? *Contemporary Education Technology, 12*(2), 1-11.

Nakamura, Y., Yoshitomi, K., Kawazoe, M., Fukui, T., Shirai, S., & Nakahara, T. (2018). *Effective use of math e-learning with questions specification.*: Springer Cham

Owston, R., & York, D. N. (Producer). (2018). The nagging question while designing blended learning courses. *Does the proportion of time devoted to online activities matter*.

Pham, P. T., Nguyen, M. T., Nguyen, T. H., Doung, T., & Ho, T. Q. (2021). Blended Learning in Action: percepton of teachers and studens on implementing blended learning in CTU. *Multicultural education, 7*(4), 379-385.

Poon, J. (2013). Blended Learning:An institutional approach for enhancing students' learning experiences. *MERLOT Journal of Online Learning and Teaching, 2*, 271-289.

Psycharis, S., Chalatzoglidis, G., & Kalogiannakas, M. (2013). Moodle as a learning environment in promoting conceptual understanding for secondary school students. *Euria Journal of mathematics, Science and Technology Education, 1*, 11-21.

Sanchez-Gomez, M. C., Martin-Garcia, A. V., & Mena, J. (2019). Teachers' beliefs towards blended learning in higher education., 177-188.

Syah, R. H. (2020). Dampak Covid-19 Pada Pendidikan di Indonesia: Sekolah, Keterampilan, dan proses Pembelajaran. *SALAM: Journal Sosial Dan Budaya Syar-I, 7*(5).

Tong, D. H., Uyen, B. P., & Ngan, L. K. (2021). Blended learning for mathematics during covid-19 Lock down:a case study of apprehending conventions for coordinates in the plane.

Watling, S. (2012). Student as producer and open educaional resources: enhancing learning through digital scholarship. *Enhancing Learning in the Social Sciences, 4*(3), 1-7.

Watson, J., & Murin, A. (2014). A History of K-12 Online and Blended Instruction in The United States. *In Handbook of Research on K-12 Online and Blended learning*.

Zhang, W., & Zhu, C. (2017). Review on blended learning: identifying the key themes and categories . *International Journal of Information and Education Technology, 7*(9), 673-678.