

Impact of Using Edmodo as a Blended Learning Strategy on Promoting Early Childhood Care Education and Pre-Service Teachers Academic Achievement in Mathematics

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ABSTRACT

The study examines Impact of Using Edmodo as a Blended Learning Strategy on Promoting Early Childhood Care Education Pre-Service Teachers Academic Achievement in Mathematics. Based on the purpose of the study three hypotheses guided the study. The population of the study comprised of six hundred and three (603) pre-service teachers. A sample of two hundred and thirty-five (235) Pre-service teachers was selected. The study adopted non-randomized pretest-posttest Quasi-experimental design. "Mathematics Achievement Test (MAT) was used to collect data for this study. The reliability co-efficient(r) of 0.86 obtained using kuder-Richardson 20 method. Data collected were analyzed using ANCOVA to test the hypotheses at a 0.05 level of significance. The results showed that revealed that Edmodo as a blended learning strategy enhanced pre-service teacher's achievement in mathematics bridged the gap between difference level of achievers and reduced gender achievement gaps in mathematics.it was recommended that Mathematics teachers at the tertiary school level should employ Edmodo learning approach in teaching to enhanced learners; achievement.

Keywords: *Edmodo, Early Childhood Care Education Pre-Service Teachers, Academic Achievement and Mathematics*

INTRODUCTION

Mathematics is a subject that has been defined by various authorities. One of the characteristics of mathematics from the various definitions is that it is a subject that is encapsulated with abstractions. It is also a subject that many students dread as a result of the myths that surround the subject (Buckley, 2013, Taylor, 2010). Glenda and Walshaw (2009) posited that many students struggle with mathematics and this makes them to become disaffected. The performance of students in mathematics has persistently continued to be poor. Mathematics is seen as the language used to describe the problems arising in most branches of science and technology. It is a subject that is related to other school subjects in areas like number and numeration, variation, graphs fractions, logarithms and indices, algebraic processes, solution of equation and also in area and volume. However, the performance of students in mathematics has been a great concern to the society. Awokoya & Fafunwa in Unamba (2013), both agreed in different researches that we live in a world where science and technology have become an integral part of the world culture, therefore for any nation to be relevant; it must not overlook the importance of mathematics in her educational system. Accordingly, the observed poor performance in mathematics has been a matter of serious concern to all well-meaning educators. Students 'poor performance in mathematics over the years has been attributed to the fact that the subject is difficult. In the same view, student's performance in mathematics tests has been observed to vary from person to person and from school to school. It is important for students to be prepared for the future by facing real problems in their learning environment and producing appropriate solutions to these problems (Unamba, 2013). Therefore, appropriate methods must be chosen to salvage this situation in the learning environment. One of these methods is the use of Edmodo.

Edmodo is a social learning platform for teachers, students, and parents to share content or information and homework. Through Edmodo, educators and learners are connected in a safe social environment. They can share digital contents and access homework, grades, class discussion from computer or any device. The following explanation provides Edmodo features that are useful for both educators and learners (<http://susd.edmodo.com>). Participants can exchange concepts, records, events, and projects in a virtual setting. It is a private micro-blogging and social learning platform for teachers and students. According to Holotescu and Grosseck (2009), microblogging is a new system of blogging and a Web 2.0 technology that allows users to publish online brief text updates. Edmodo was identified by the American Association of School Librarians in 2011 as one of the top 25 websites that foster the qualities of innovation, creativity, active participation, and collaboration in the classification of

“Social Networking and Communication” (Kongchan, 2012). Learning media are an important element in every learning and teaching process because they are the tools teachers use to deliver the learning material and to facilitate learning activities (Kirkwood & Price, 2014). Edmodo is a free social learning platform for teachers, parents, and students where there are already over 29 million users. Edmodo can be used in a classroom through a variety of applications that allow students to connect with each other and their teachers, as well as measure student performance (Mrayed, 2020).

Teachers can set up classes for each in-school class or set up a large class and have all of their students in one group. Edmodo makes it simple to track student progress. According to Gay & Sofyan (2017), Edmodo is an online learning environment that is an interactive process where the student is assisted by others (teachers or peers) to acquire knowledge or skills that cannot be acquired without assistance at that point in time. Through Edmodo, educators and students can share notes, links, and documents. Educators also have the ability to send alerts, events, and tasks to students and may decide to send something on a timeline that can be viewed by the public. Based on what Shams-Abadi *et al.* (2015); Zain *et al.* (2016) pointed out, Edmodo is an education website that absorbed the idea of social networking and improved it to make it suitable for classroom teaching. With Edmodo, students and teachers can connect with each other by sharing ideas, questions, and useful tips. This means that, by using Edmodo, both teachers and students can participate in activities that support language learning and can stay connected by sharing ideas, questions, and useful techniques. In addition, Edmodo is based on the school's social network environment, so like other social media such as Facebook, Twitter, and Path, Edmodo is also used to promote communication among teachers, students, and parents in the school environment (Balasubramanian *et al.*, 2014; Ma'azi & Janfeshan, 2018). In order to prevent students from being distracted when using Edmodo, the content of Edmodo is controlled by the teacher. In this way, teachers can prevent inappropriate things from appearing on public social media.

Edmodo works as an educational institution for its own benefits. Edmodo is ideal for teaching and learning as a primary tool, as a semi-primary tool in a web-enhanced course with mixed-mode learning, or as a supplementary tool in a web-enhanced classroom (as a supplement to face-to-face). Additionally, Gabrina & Rahmawati (2019) found in their study that Edmodo helped the students develop their writing and listening skills. The students have a positive response towards the use of Edmodo as a learning tool. Edmodo facilitates the students' ability to work independently and share their thoughts through group discussions; these discussions help them a lot in writing and can be used to inspire students to write at their own pace.

Students are more interested in learning because Edmodo allows collaborative writing, which allows them to practice their native language. Using online learning platforms in the learning process is effective since it saves time and effort. They also consider that online learning is environmentally friendly because it can save paper used for the assignment. Through Edmodo, students work with their peers and inevitably need to collaborate with others (Buescher, 2010), whether it is pair work, group work, or class work. In addition, Edmodo can encourage students to learn actively by publishing notes, uploading learning materials to their personal digital library, and writing reviews. In addition, when learners are allowed to explore multimedia resources that meet their learning preferences and needs, they will be keen on participating in the learning process. Edmodo facilitate collaboration and virtual teamwork among students, speed up the learning process (Wire, 2014), and enable students to proficiently handle tasks online.

Research on Edmodo in learning has identified its potential to provide teachers and students with many benefits that facilitate the teaching and learning process. Using Edmodo for teaching and learning can be a good teaching design that can stimulate curiosity, increase motivation, and enrich the learning process (Song & Kong, 2017). The advantages of using Edmodo in the teaching process are that some teachers may only want to use Edmodo to share resources and learning objects with the whole class (Ekici, 2017). These can be accessed in class to save paper, prevent students from searching for inappropriate resources, etc. Lie (2015) also explained that when class time is not enough, Edmodo can have extended discussions. Another advantage is that some students who are usually shy in class can express themselves more freely online. Furthermore, online discussions enable teachers to tailor course materials to students' personal interests and to spark discussions about moral judgments. Evenddy & Hamer (2016) also state that Edmodo can make the teaching-learning process more interesting. Using Edmodo's features, the teacher can give assignments, quizzes, share the materials, and give feedback on students' work directly.

Al Khatiri's (2015) research focuses on students' perceptions and challenges of using Edmodo and their impact on their attitudes towards EFL learning. It involved 42 Saudi EFL female secondary school students who were divided into the experimental group (21) receiving the traditional teaching plus a six-week daily interaction via Edmodo and the control group (21) receiving the traditional teaching only. The data obtained through the post-treatment questionnaire shows that students have a highly positive view of Edmodo, despite the considerable challenges in its integration. The survey results also show that Edmodo has the extraordinary potential to generate a more positive attitude towards EFL learning.

Pardede (2019) surveyed EFL students' views on blended learning. Using a mixed method research design, quantitative and qualitative data were collected from 32 participants, including students from the Department of English Education, Christian University, Jakarta. The results show that students' views on blended learning are positive. According to their reports, participants value learning using online platforms not only because it provides convenience, flexibility, and instant access, but also because it increases their participation and independence and develops their technical and information literacy skills (Pardede, 2019).

Siahaan (2020); Wahyuni (2018) found that students in the experimental class gained better writing skills when use Edmodo in teaching and learning. Ekmekçi (2016) explored students' views about the use of Edmodo as an assessment tool in English language classrooms. Results showed positive perception as assessment tool. Similarly, Enriquez (2014) explored high-school students' perceptions of the effectiveness of the use of the Edmodo application as a support tool for learning. The results obtained from the analysis of focus group discussions and interviews showed that students thought that Edmodo is an effective tool.

Purpose of the study

The main purpose of the study was to determine the impact of using edmodo as a blended learning strategy on promoting early childhood care education pre-service teacher's academic achievement in mathematics. Specifically, the study will determine whether.

1. Pre-service teachers taught mathematics using edmodo as blended learning strategy will have better mean achievement scores than those taught using traditional approach.
2. Mean achievement scores of low and high achievers taught mathematics using edmodo as a blended learning strategy
3. Male and female Pre-service teachers taught mathematics using edmodo will differ in their mean achievement scores.

Hypotheses

The following hypotheses were formulated to guide the study:

H₀₁: There is no significant difference in mean achievement scores of pre-service teachers taught mathematics using edmodo as a blended learning and those taught using traditional approach.

H₀₂: There is no significant difference between the mean achievement scores of low and high achievers taught mathematics using edmodo as a blended learning strategy.

H₀₃: There is no significant difference in mean achievement scores of male and female pre-service teachers taught mathematics using edmodo as a blended learning strategy.

METHOD

The study adopted quasi-experimental research design involving the pre-test post-test equivalent control type was used to determine the impact of using Edmodo as a Blended Learning strategy on Promoting Pre-service teachers Academic Achievement in Mathematics. A sample size of 235 pre-service teachers was used for the study. Two second years classes were selected through simple random sampling technique (Regular and Evening). In each of the two classes selected, one intact class were randomly assigned to control and experiment groups respectively. The control groups consist 115 pre-service teachers while the experimental groups had 120 pre-service teachers. The control group had 62 females and 53 males while the experiment group had 56 females and 64 males. A total of 117 male and 118 female pre-service teachers took part in the study. The instrument for data collection was researchers made achievement test title “Mathematics Achievement Test (MAT). It was a 60-items objective test questions with options from A-D. The items were based on the topic taught to the pre-service teachers during the study and guided by a test blue- print.

The face and content validity of the instrument were determined by two mathematics educationists and a measurement and evaluation expert. They vetted the instrument and made their inputs which guided the restructuring of the instrument and the questions were reduced from 50 items. To determine the reliability of the instrument it was administered to 30 pre-service teachers outside the study group but had the same characteristics with the study group. The data generated was subjected to analysis using Kuder-Richardson (KR₂₀) formula and this gave a reliability coefficient (r) of 0.86 which was considered adequate for the study. To carry out the study-proper the control and experiment groups were administered with a pre-test to determine their readiness and cognitive levels. After that the control group was taught mathematics concept “Linear Equation” by their regular mathematics teacher using a drafted lesson plan based on “talk and chalk” approach. The teacher controlled the entire lesson without pre-service participation asking questions and directing learning process as pleased. While research assistants who are trained for two weeks on edmodo as a blended learning strategy taught the experiment group using a lesson plan drafted in accordance with edmodo as a blended learning strategy. In this context, the learners are given free hand to participate in classroom activities using instructional resources available, interacted with each other in groups. The teacher motivated the participant as

the lesson progressed, pre-service teachers were allowed some minutes break during the lesson to walk round the class, concept taught was related to real life situation, teachers shared learner's problems with them as the teaching progressed. No threatening atmosphere was created by the teacher, participant designed ideas on possible measures of resolving problem situations and the teacher avoided overloading the pre-service teacher's brain with lots of problems. The lessons lasted for three weeks as the lessons were done three times a week using 45 minutes' interval for each class. The researcher who was non-ground monitored the progress of the study and ensured that the set-out plans were maintained. After the three weeks, a post-test was administered to both groups using a rearranged version of the same instrument used for pre-test. The data generated was collated on a table and the ANCOVA statistical tool was used to test the hypotheses at a 0.05 level of significance.

RESULTS AND DISCUSSION

Table 1: Summary of ANCOVA analysis on pupil's achievement

Source	Type III sum of squares	Df	Mean square	F	Sig
Corrected model	40328.877	7	5761.268	61.364	.000
Intercept	12959.520	1	12959.520	138.033	.000
Covariate	301.480	1	301.480	3.211	.074
Method	32773.086	2	16386.543	174.535	.000
Sex	4.523	1	4.523	.048	.826
Achievers	63.666	1	63.666	.678	.411
Method* sex	523.874	1	533.874	5.686	.018
Method * achiever	1.209	1	1.209	013	.910
Error	21312.298	1			
Total	555503.000	235			
Corrected total	61641.174	234			

The table 1 shows that f-calculated value 174.535 for method is greater than the table value 3.84 and $p < 0.05$. Based on the result, the null hypothesis is rejected and the alternative accepted at a 0.05 level of significance. This implies that there is a significant difference between the mean achievement scores of pre-service teachers taught mathematics using Edmodo as a blended learning strategy and those taught using traditional approach.

From the Table 1, f-calculated value .678 at the achiever's row is less than the f-table value 3.84 and $p > 0.05$. Based on the result, the null hypothesis that there is no significant difference between the mean achievement scores of low and high achievers taught mathematics using edmodo as a blended learning strategy is upheld at a 0.05 level of significance. The Table 1 further shows that f-calculated value 0.48 is less than the table value 3.84 and $p > 0.05$. Based on the result, the null hypothesis that there is no significant difference between the mean achievement scores of male and female pre-service teachers taught mathematics using edmodo as a blended learning strategy is upheld at a 0.05 level of significance.

The result of the study revealed that pre-service teachers taught mathematics using edmodo as a blended learning strategy enhanced achievement in mathematics. In this approach learners learned at their own pace, interacted with instructional resources, learned in relaxed environment, had good interaction with the teachers. The statistical result showed a significant difference between the mean achievement scores of pre-service taught mathematics using Edmodo as a blended learning strategy and those taught using "traditional approach. This result is consistent with Al Khatiri's (2015) research focuses on students' perceptions and challenges of using Edmodo and their impact on their attitudes towards EFL learning. Result indicated that students have a highly positive view of Edmodo, despite the considerable challenges in its integration. The survey results also show that Edmodo has the extraordinary potential to generate a more positive attitude towards EFL learning. The study revealed that Edmodo as a blended learning is self-perpetuating neuro-cognitive approaches enhance students learning (Buescher, 2010). It was noted that the relative effectiveness of the Edmodo as a blended learning strategy over the conventional method could be due to the fact that Edmodo as a blended learning strategy is a learner-centered instructional strategy which provides learners with the opportunity for orchestrated immersion-creating learning environments that fully immersed learners in an educational experience.

The study revealed that that Edmodo as a blended learning strategy bridged the gap between low and high achievers in mathematics as the statistical analysis revealed no significant difference between the different level of achievers. The result also is in agreement with Hamer (2016) also state that Edmodo can make the teaching-learning process more interesting. By using Edmodo's features, the teacher can give assignments, quizzes, share the materials, and give feedback on students' work directly.

Finally, the study also revealed that gender is not a barrier in mathematic achievement among pre-service teachers' if appropriate instructional strategy such as Edmodo as a blended learning strategy is applied. The statistical analysis revealed no statistically significant differences between male and female pre-service teacher's achievement in mathematics due to application of edmodo learning strategy. This result

is in line with Ajai and Imoko (2015) which indicated that male and female students perform equally in mathematics when they see themselves as equals and capable of competing and collaborating in classroom activities.

CONCLUSION AND RECOMMENDATIONS

The result of the study revealed that Edmodo as a blended learning strategy enhanced pre-service teacher's achievement in mathematics bridged the gap between difference level of achievers and reduced gender achievement gaps in mathematics. Based on the result of the study the following recommendations are made:

- i. Mathematics teachers at the tertiary school level should employ Edmodo learning approach in teaching to enhanced learners; achievement.
- ii. Teacher training institutions should ensure that pre-service teachers are trained on the use of edmodo learning approach in teaching mathematics.
- iii. The government and school managers should organize workshops, seminars and symposium to re-train teachers on innovative approaches to teaching such as Edmodo learning strategy.

REFERENCES

- Al-Kathiri, F. (2015). Beyond the Classroom Walls: Edmodo in Saudi Secondary School EFL Instruction, Attitudes and Challenges. *English Language Teaching*, 8(1), 189- 204. <https://eric.ed.gov/?id=EJ1075186>.
- Anshari, M., Almunawar, M. N., Shahrill, M., Wicaksono, D. K., & Huda, M. (2017). Smartphones usage in the classrooms: Learning aid or interference. *Education and Information technologies*, 22(6), 3063-3079. <https://doi.org/10.1007/s10639-017-9572-7>.
- Balasubramanian, K., Jaykumar, V., & Fukey, L. N. (2014). A study on “Student preference towards the use of Edmodo as a learning platform to create responsible learning environment”. *Procedia-Social and Behavioral Sciences*, 144, 416-422. <https://doi.org/10.1016/j.sbspro.2014.07.311>.
- Buescher, E. (2010). Edmodo: A white paper. Retrieved http://coe.winthrop.edu/jonesmg/LTI/2010Fwhitepapers/Eileen_Buescher.pdf.
- Ekici, D. I. (2017). The Use of Edmodo in Creating an Online Learning Community of Practice for Learning to Teach Science. *Malaysian Online Journal of Educational Sciences*, 5(2), 91-106. <https://eric.ed.gov/?id=EJ1142512>.
- Ekmekçi, E. (2016). Integrating Edmodo into Foreign Language Classes as an Assessment Tool. *Participatory Educational Research (PER)*, 1, 1-11.
- Enriquez, M. A. S. (2014). Students’ Perceptions on the Effectiveness of the Use of Edmodo as a Supplementary Tool for Learning. In DLSU Research Congress, De La Salle University, Manila, Philippines.
- Evenddy, S., & Hamer, W. (2016). Edmodo as a media to teach vocabulary. *Journal of English Language Studies*, 1(1). <http://dx.doi.org/10.30870/jels.v1i1.685>
- Gabrina, P. A. S., & Rahmawati, F. (2019). Exploring the Use of Edmodo in an EFL Classroom. *Journal of Foreign Language Teaching and Learning*, 4(2), 106-125. <https://doi.org/10.18196/fl.4241>.
- Gay, E., & Sofyan, N. (2017). The Effectiveness of Using Edmodo in Enhancing Students Outcomes in Advance Writing Course of the Fifth Semester at Fip-Ummu. *Journal of English Education*, 2(1), 1- 11.
- Holland, C., & Muilenburg, L. (2011). Supporting student collaboration: Edmodo in the classroom. In Society for Information Technology & Teacher Education International Conference (pp. 3232-3236). Association for the Advancement of Computing in Education (AACE).
- Kember, D., & Kwan, K. P. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instructional science*, 28(5), 469-490. <https://doi.org/10.1023/A:1026569608656>.

- Lie, A. (2015). Social media in a content course for the digital natives. *Teflin Journal*, 24(1), 48-62. <http://dx.doi.org/10.15639/teflinjournal.v24i1/48-62>
- López, J. S. M., Leo, J. L. & Miyata, Y. (2013). Using Edmodo in international collaborative projects in primary education. *Revista Electrónica de Tecnología Educativa*, 43, 1-17.
- Ma'azi, H., & Janfeshan, K. (2018). The effect of Edmodo social learning network on Iranian EFL learners writing skill. *Cogent Education*, 5(1), 153-182 <https://doi.org/10.1080/2331186X.2018.1536312>.
- Mohamad, S. N. M., Salleh, M. A. M., & Salam, S. (2015). Factors Affecting Lecturers Motivation in Using Online Teaching Tools. *Procedia-Social and Behavioral Sciences*, 195, 1778-1784. The Edmodo Teacher Guide retrieved from <http://susd.edmodo.com>
- Mrayed, S. M. (2020). Using Edmodo online application as a supplement to enhance student level of performance and critical thinking in the learning process of Thermodynamic course. In 2020 Sixth International Conference on e-Learning (econf) (pp. 390-394). IEEE.
- Pardede, P. (2019). Pre-service EFL teachers' perception of Blended learning. *JET (Journal of English Teaching)*, 5(1), 1-14. <http://dx.doi.org/10.33541/jet.v5i1.955>.
- Shams-Abadi, B. B., Ahmadi, S. D., & Mehrdad, A. G. (2015). The effect of Edmodo on EFL learners' writing performance. *International Journal of Educational Investigations*, 2(2), 88-97.
- Siahaan, E. B. (2020). Students' Perception of Edmodo Use as a Learning Tool. *Journal of English Teaching*, 6(1), 12-23.
- Song, Y., & Kong, S. C. (2017). RETRACTED: Affordances and constraints of BYOD (Bring Your Own Device) for learning and teaching in higher education: Teachers' perspectives. <https://doi.org/10.1016/j.iheduc.2016.08.004>.
- Thongmak, M. (2013). Social network system in classroom: antecedents of Edmodo© adoption. *Journal of eLearning and Higher Education*, 2013,
- Wahyuni, S. (2018). The effect of blended learning model towards students' writing ability. *J-SHMIC: Journal of English for Academic*, 5(2), 97-111. [https://doi.org/10.25299/jshmic.2018.vol5\(2\).1801](https://doi.org/10.25299/jshmic.2018.vol5(2).1801).
- Wire, B. (2014). Edmodo releases App for Windows 8.1 at ISTE 2014. <http://businesswire.com/news/home/20140628005006/>.
- Zain, F. M., Sahimi, S. M., Hanafi, E., Halim, A. H. A., & Alias, A. K. (2016). A Study of Students' Interaction in Edmodo Social Learning Platform. In *Envisioning the Future of Online Learning* (pp. 147-158). Springer, Singapore. https://doi.org/10.1007/978-981-10-0954-9_13.