



Effects of Edmodo Learning Network on Students' Interest, in Electronics III in Polytechnics of North-Central, Nigeria

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ABSTRACT

This study investigated the impact of the Edmodo Learning Network on students' interest in Electronics III in polytechnics across North-Central Nigeria. It was guided by two research questions and two corresponding hypotheses. A quasi-experimental, non-randomized design was adopted, involving 60 students, with 30 in the experimental group and 30 in the control group. The Students' Interest in Electronics III Inventory (SIEI) scale, adapted and modified from Aqahtani (2019), was validated by three experts in relevant fields. The instrument's reliability was assessed using Cronbach's alpha, yielding a reliability coefficient of 0.89. The experimental group received instruction via the Edmodo Learning Network, while the control group was taught through traditional methods. Data analysis involved means and standard deviations for answering the research questions, while independent sample t-tests at a 0.05 significance level were used to test the hypotheses. Findings revealed that students in the experimental group demonstrated significantly greater interest than those in the control group. The study recommends integrating the Edmodo Learning Network into the polytechnic curriculum in North-Central Nigeria to enhance students' motivation and improve learning outcomes in Electronics III.

ARTICLE INFO

Article History

Received: August, 2024

Received in revised form: October, 2024

Accepted: December, 2024

Published online: December, 2024

KEYWORDS

Edmodo, Learning, Network, Interest,
Electronics III and Polytechnics

INTRODUCTION

Developing countries like Nigeria recognize the critical role of education, particularly in technology innovations, as a driver of national development. The Federal Republic of Nigeria (FRN) (2013) emphasized that globalization and technology necessitate the incorporation and promotion of educational technologies to support rapid growth in emerging markets. According to FlexiSAF, (2023) education is widely recognized as a key driver of progress in developed and developing countries such as; Nigeria is no exception. Being heavily populated, the future of Nigeria's success depends to a great extent on its education system and is the bedrock of development of any country. As important as education is recognized in Nigeria, its system is

viewed facing numerous challenges such as inadequate infrastructure, insufficient teaching materials and methods among others (Idoko, 2024).

Since the establishment of educational system, the use of conventional methods of teaching though not without some advantages are found dominating teaching and learning in education sector over decades. The use of lecture, discussion etc has cause students to lose interest in learning thereby; bringing about low academic achievement scores. The case is not different from students in polytechnics offering Electronics III course. Jack (2017) asserted that conventional teaching methods refers to lecture, discussion and so on; and is teacher- centred approach where the teacher introduces a lesson

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by stating and explaining the topic or concept, and at the end of the lesson evaluate it by asking questions and giving assignments respectively. Owing to the above, students may not fully understand the learnt concepts; which makes them seem not to fully construct their own understanding of the concepts that needed to be learnt. Therefore, they can be referred to as passive learners. Cyril (2016) opined that in order to promote active participation in teaching and learning, both students and lecturers need to adjust their learning and teaching strategies, approaches or styles to a learner-centered strategy in order to determine the learning outcome. Jack (2017) and Cyril (2016) earlier connect high failure rates in technical education to ineffective teaching approaches that diminish student motivation and success.

The low performance and failure rate of students in examinations has raised concerns over system challenges attributed to; teaching approaches, lack of interest and care free attitude of student towards learning (Afolabi, 2014). The low performance or failure rate is not different with electronics courses offered at the polytechnics education system of South-East, Nigeria. Electronics III course is an important course for ND II and is mainly on general nature of positive and negative feedback in systems (Ojo-Williams, 2021). However, Kurniawati, Purwasih, Anzari, & Apriadi, (2021) highlighted persistent failures in the Electronics III course among polytechnic students. Similarly, Jack (2017) attributed low interest to student apathy towards technical vocational education and the teaching methods employed by instructors. This failure rate underscores the FRN's assertion that the educational sector must prioritize the exploration of technologies to enhance educational quality and accessibility for national development. In response, Ajayi, Ogunode, and Ayoko (2023) noted that the government introduced an e-learning platform in 2021 to promote inclusive education through innovative technologies. To enhance the quality of educational delivery for national development, Zechlin (2011) advocated for the use of innovative technologies. This shift in educational paradigms emphasizes the need for

conditions that support diverse learning experiences, moving away from conventional methods. Innovative learning technologies aim to engage students, leading to motivated interest and fulfilment (Jack, 2017).

In response to global trends, educators are exploring innovative methods to transform teaching and learning (Yunkul & Cankaya, 2017). Heba and Hatem (2017) identified social learning networks like Google, Wikipedia, LinkedIn, and Edmodo are platforms that facilitates user-generated content and enhance real-time interaction and information sharing. Adeyinka (2015) noted that Edmodo, designed specifically for educational purposes, has been effective in fostering meaningful learning aligned with contemporary trends. Edmodo was developed by O'Hara and Nic Borg in 2008, the learning network served as a learning management system (LMS) designed to enhance communication, collaboration, and knowledge sharing among lecturers, students, and parents in a secure educational environment. According to Trust (2012), Edmodo Learning Network is described as an interactive platform resembling social networking sites, enabling collaborative learning among teachers and students. Brinton and Chiang (2014) highlight Edmodo as an innovative technology that functions as a blended learning interface applicable to various educational courses. Similarly, Ikehi, Paradang, and Zimoghen (2014) noted that Technical Vocational Education and Training (TVET) relies on technological tools, including internet-based social learning networks. Utilizing Edmodo to teach the Electronics III course at the polytechnic level has been shown to foster greater interest in the learning objectives.

Interest is defined as a sense of curiosity or concern toward a task or object, plays a vital role in academic settings. Lee and Durksen (2018) describe academic interest as a personal inclination toward activities that build academic skills and knowledge, a crucial factor in various aspects of student learning. This interest reflects a focused desire to learn, understand, or continue engaging with a topic. Anni and Kalle (2016) identify interest as a key motivational process that

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not only drives learning but also influences academic and career paths, essential for academic success. Studies further confirm that academic interest is positively linked to academic achievement, with greater interest often leading to improved performance (Scispace, 2024). Interest reflects students' progress towards educational goals and is a crucial motivational factor influencing learning and success (Harackiewicz, Smith, and Priniski, 2016). The introduction of innovative technologies like Edmodo can motivate millennial aged students, enhancing their engagement and energy in learning compared to traditional methods. This context prompted the researcher to investigate the effects of the Edmodo learning network on students' interest in Electronics III courses at polytechnics in North-Central, Nigeria.

Evidences to the present study, Enwere and Emeasoba (2019) carried out a study on: Effect of using Edmodo learning platform on academic achievement and interest of male and female students in business studies. The purpose of the study was to investigate the effect of using Edmodo learning platform on the academic achievement and interest of male and female students in business studies. Çobanoğlu (2017) explored student teachers' satisfaction with blended learning via the Edmodo system, focusing on future teachers' adaptation to blended (face-to-face and online) learning environments. While most related studies are from foreign or Western contexts, with few exceptions in Nigeria, research on Edmodo's adoption in South-East Nigerian polytechnics is limited. This gap underscores the need to study Effect of Edmodo on polytechnic education. Consequently, the study aims to determine Effect of Edmodo on students' interest in Electronics III in polytechnics of North-Central, Nigerian.

STATEMENT OF THE PROBLEM

Students in Electronics III at polytechnics have shown consistently poor academic performance, which, according to Jack (2017), limits their workforce readiness due to insufficient knowledge and skills. This issue stems from traditional teaching methods that fail to

engage millennial learners, reducing both performance and interest (Kurniawati, Purwasih, Anzari and Apriadi, 2021). Conventional; lecture methods contribute to low interest, as students find them un-engaging. Jack (2017) and Ajayi, Ogunode, and Ayoko (2023) connected high failure rates in technical education to ineffective teaching approaches that diminish student motivation and success. Cyril (2016) further stated that the failure rates of students in academic pursuits especially in electronic have been attributed to lack of interest and care free attitude towards learning. The Nigerian government's National Policy on Education (2013) emphasized its role in enhancing essential knowledge and skills for a knowledge-based society, aiming to build infrastructure and capacity for effective educational Information Technology (IT) use.

Despite these goals, Ajayi, Ogunode, and Ayoko (2023) note challenges like limited funding, insufficient technology, and poor internet access hinder IT initiatives, leading teachers to rely on conventional/traditional and less engaging methods. Ideally, the alternatives include innovative networks (Google, Wikipedia, social media) to foster peer collaboration (Kevin, 2014). When students are granted frequent use and enjoyment of digital tools, these approaches could enhance learning and motivate interest leading to more output academic performance. In spite efforts to improve exam success, failure rates in Electronics III remain high in the polytechnics in South-East, Nigerian, where e-learning methods, including platforms like Edmodo Learning Network is underutilized. This trend threatens educational progress, prompting research into innovative teaching methods. This study explored the effect of Edmodo Learning Network on students' interest in Electronics III in polytechnics in North-Central, Nigeria.

Aim and Objectives

The aim this study is to determine the Effects of Edmodo Learning Network on students' Interest in Electronic III in Polytechnics of North-Central, Nigeria. Specifically, the study sought to determine:

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1. The difference between mean pre-interest ratings of students in experimental and control groups prior to treatment.
2. The difference between mean interest ratings of students taught Electronics III using Edmodo Learning Network and those taught without Edmodo Learning Network.

Research Questions

The following research questions guided this study.

1. What is the difference between pre-interest mean ratings of students in experimental and control groups prior to treatment?
2. What is the difference between mean Interest ratings of students taught Electronics III using Edmodo Learning Network and those taught without ELN?

Research Hypotheses

The following null hypotheses guided this study.

- H₀₁:** There is no significant difference in mean pre-interest ratings of students in experimental and control groups prior to treatment
- H₀₂:** There is no significant difference in Interest ratings of students taught Electronics III using Edmodo Learning Network and those taught without ELN.

METHODOLOGY

The design adopted for this study was quasi-experimental pre-test post-test non-equivalent, non-randomized design. This design was considered suitable for this study since it made use of the existing intact classes. This study was conducted in Benue State Polytechnic, Ugbokolo and Plateau State Polytechnic, Barikin Ladi of North-Central geographical region of Nigeria.

The population of the study 357 ND II students in all the Federal and State polytechnics that offered Electronics III course in North-Central, Nigeria. A sample of 68 students was used with 27

students in the Experimental group while 41 students in control group used the conventional teaching methods. Simple Random Sampling (SRS) technique was used in the selection of the two to polytechnics. Furthermore, Random Number Generator (RNG) was used to assign one polytechnic into the experimental group taught with Edmodo learning network while another was assigned into the control group with conventional method. Data was collected using Students Interest in Electronics III Inventory (SIEI) scale. Students Interest in Electronics III Inventory scale (SIEI) were adapted from Aqahani (2019) and modified and used in this study.

The instrument was validated by three experts: one expert from Abubakar Tafawa Balewa University, Bauchi. Another expert from Benue State University, Makurdi and an expert from Benue State Polytechnic, Ugbokolo. Each expert was served with a copy of the instrument and was requested to ascertain the validity, suitability and appropriateness of the contents in the items. All the inputs, suggestion and modifications made by the experts were corrected before the final copy was produced and used for the study. The researcher prepared two sets of lesson plans: one for experimental and the other for control groups. The experimental group was taught Electronics III using Edmodo Learning Network contained in the experimental group lesson plan as experimental treatment, while the control group used the conventional lecture method. The instruments were trial tested; hence using Cronbach Alpha and its established reliability coefficient yielded 0.87. Madiha and Walid (2016) suggested that if a coefficient is 0.7 and above, the instrument should be considered significant and reliable for the study. The researcher with the help of one trained research assistants administered the instruments prior and after to the students in their examination halls to obtain data for the study. The collected data was analysed using mean and standard deviation to answer the research questions while the null hypotheses were tested at 0.05 level of significance.

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RESULTS

The results of this study are presented according to research questions and their corresponding hypotheses.

Research question 1: What is the difference between pre-interest mean ratings of experimental and control groups taught Electronics III prior to the treatment?

Table 1 presented that at pre-test, 27 students in the experimental group had mean achievement scores of 1.35 with standard deviation of 0.18 while 41 students in the control group had mean achievement scores of 1.26 with standard deviation of .0.17. The mean difference is 0.09. This trivial difference indicated that the interest level of students in Electronics III in both groups before the commencement of the treatment was almost similar.

Table 1: Summary of Pre-interest Achievement scores of students in experimental and control groups

Group	N	Mean	Std. Deviation	Mean Diff.
Experimental group	27	1.3524	.17981	
Control group	41	1.2628	.17214	0.0896

Research questions 2: What is difference between post interest mean ratings of students taught Electronics III with Edmodo Learning Network (ELN) and those taught without ELN?

ratings of 3.64 with standard deviation of 0.31 while 41 students in control group had interest ratings of 2.89 with standard deviation of 0.43. The mean difference is 0.74 meaning that the difference is in favour of students who were taught Electronics III using Edmodo Learning Network (ELN).

Table 2 showed that the post-test of 27 students in experimental group had interest mean

Table 2: Summary of post-interest mean ratings of students in Electronics III using Edmodo Learning Network (ELN) and those taught without ELN

Group	N	Mean	Std. Deviation	Mean Diff.
Experimental group	27	3.6356	0.3116	
Control group	41	2.8938	0.4323	0.7418

Hypothesis Testing

H₀₁: There is no significant difference between pre-test mean achievement scores of students in the experimental group and those in the control group taught Electronics III prior to the treatment.

greater than 0.05. This signifies that there is no significant difference in the pre-test mean achievements scores of experimental and control groups. The study therefore, accepted the null hypothesis. This showed that before treatment, both groups of students have no significant difference in their Electronics III knowledge levels. The analysed result of the independent sample t-test of hypothesis one indicated that the experimental group showed a significant higher mean (7.7778) compared to the control group (7.1463) with a small effect size (Cohen's $d = 0.1899$). This suggests that the intervention had a small statistically significant effect.

An independent sample t-test was carried-out to test the difference between pre-test mean achievement scores of students in the experimental group and those in the control group taught Electronics III prior to the treatment. Table 3 illustrate the pre-test experimental group (N =27, M =7.78, SD =2.08) and control group (N =41, M =7.15, SD =4.21), and p-value = 0.473 which is

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Table 3: Independent Sample t-test of pre-tests Achievement scores of experimental and control groups

Pre-test	No	Mean (\bar{X})	Standard Deviation (SD)	t-value	Df	Sig. (2-tailed) =p-value	Remarks
Experimental	27	7.7778	2.08167	.721	66	.473	Accepted
Control	41	7.1463	4.21640				

H₀₂: There is no significant difference between the post- interest mean ratings of students taught Electronics III with Edmodo Network (ELN) and those taught without ELN.

Table 17 illustrate the t-test result analysed. The t-test indicates that the interest mean ratings for experimental group is significantly higher (M =3.64, SD =0.31) then for the control post-test (M =2.89, SD =0.43). The t-value =7.69, df =66 and p <0.05. In other words, there is significant difference in the Interest ratings

scales of the post-tests of the two groups in favour of the experimental group. Thus, experimental method has statistically significant effect on the interest of students taught Electronics III with Edmodo Learning Network (ELN). The analysed result of the independent sample t-test of hypothesis two indicated that the experimental group showed a significantly higher mean (3.6356) compared to the control group (2.8938), with a large effect size (Cohen's d =1.0685). This suggests that the intervention had a large statistically significant effect.

Table 4: Independent Sample t-test of difference between the post- interest mean ratings of students taught Electronics III with ELN and those taught without ELN

Interest	No	Mean (\bar{X})	Standard Deviation (SD)	t- value	Df	Sig. (2-tailed) =p	Remarks
Experimental	27	3.6356	.31158	7.689	66	.000	Rejected
Control	41	2.8938	.43232				

FINDINGS OF THE STUDY

1. The finding when students in both groups were compared on their interests prior to treatment, the result indicated that the two groups were in the same baseline before treatment. The result was supported by the corresponding null hypothesis found that at the beginning of experiment, the NDII students in experimental and control group did not differ significantly in their interest levels. Therefore, the null hypothesis was accepted.
2. The finding of research question two indicated that, students in Experimental group taught with ELN had higher interest mean ratings than those in the control group taught without ELN (conventional method). The result was supported by its corresponding null hypothesis suggests that

there is a significant effect of Edmodo learning network on students' interest in Electronics III course. Hence, the null hypothesis was rejected.

DISCUSSION OF FINDINGS

The finding before commencement of the treatment, revealed that the mean pre-interest ratings indicated that the two groups had interest ratings not so significant. Therefore, the null hypothesis was accepted.

Also, the finding of the difference between mean interest ratings of students taught Electronics III with Edmodo Learning Network (ELN) and those taught without ELN revealed that, students in experimental group taught Electronics III with Edmodo learning network indicated more interest in learning Electronics III course and achieved higher interest ratings than their control

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group counterparts taught without ELN. Therefore, the null hypothesis was rejected. This implies that ELN is an effective innovative approach of instructional delivery.

The finding is in agreement with Ervin and Nurlaily (2017), the findings from this study showed that the use of Edmodo learning network successfully facilitated students' Interest in participation in online discussions and task. It implies that the use of Edmodo also has the capabilities of enhancing students' interest and motivation in improving their learning skill.

CONCLUSION

Based on the findings of the study, it was concluded that the Edmodo Learning Network was highly effective in enhancing the learning process. The platform provided an engaging and interactive environment that significantly motivated students to achieve better academic results and develop a greater interest in learning Electronics III compared to the conventional/traditional learning approach.

The study revealed that students who used Edmodo were more proactive in their studies. They actively engaged with learning materials uploaded before classes, which helped them develop a deeper understanding of concepts ahead of scheduled lessons. Additionally, the platform encouraged a self-directed learning approach, where students took initiative in completing their assignments, quizzes, and other coursework tasks within the stipulated deadlines. Moreover, Edmodo's structured and collaborative features, such as discussion forums, instant feedback, and interactive multimedia resources, contributed to higher student engagement and improved retention of course content. This shift in learning behavior underscores the potential of integrating Edmodo into the Polytechnic curriculum to foster active learning, improve academic performance, and enhance students' overall learning experiences.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. Edmodo learning network application should be integrated into the curriculum specification of Polytechnics education of South-East, Nigeria to enhance students learning experiences. Also, the findings of the study suggests that Edmodo Learning Network be used in teaching and learning to enhance students' interest and their academic performance in the Electronics III course.
2. The government and administrators of Polytechnic education should implement and utilize Edmodo learning network to enhance and motivate students' interest of taught objectives.
3. The schools' administrators at Federal, State and local governments should provide adequate ICT facilities in polytechnics educational system for easy application of innovative technologies in education such as Edmodo Learning Network.

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