

Effect of E-Learning on Academic Performance of Undergraduate Students at Joseph Sarwuan Tarka University Makurdi, Benue State

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Abstract: *The study investigated the effect of E-learning on the academic performance of undergraduate students at the Joseph Sarwuan Tarka University Makurdi. Four objectives were set for the study which are to determine the effect of students' utilization of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi, determine the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi, examine the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi, determine the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi. This study employed a descriptive survey design. The target population for this study consist of 1300 physics students from the department of Science Education in Joseph Sarwuan Tarka University Makurdi, Benue State with the total sample size of 306 physics students from year 1 to year 3 in Joseph Sarwuan Tarka University Makurdi, Benue State. A structured questionnaire was designed and as the main instrument for data collection. Findings have shown that the effect of students' utilization of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State, the effect of motivation of e-learning has a significant effect on academic performance in Joseph Sarwuan Tarka University Makurdi. The study concluded that; the acquisition of relevant e-learning is vital to teachers, It also concluded that lack of e-learning tools has strong influence on academic performance in Joseph Sarwuan Tarka University Makurdi. The study recommends; that Physics teachers should be encouraged to employ the use of e-learning in the teaching of Physics, Workshops and seminars should be organized for teachers by education authorities of the Federal and State Ministries of Education, Governments should provide e-learning tools in tertiary institute.*

Keywords: *effect, e-learning, academic, achievement, students, JOSTUM*

1. INTRODUCTION

E-learning (EL) essentially encompasses ICT on websites, personal computers, portable PCs, mobile phones, learning management system (LMS), radio, and other forms of enhancing teaching and reading. In addition, it requires the application and usage of Information and communications technology (ICTs). E-learning is also a unifying term used to describe the areas of the Network and the technology directions (Elena Yu. Zolocheskaya, Svetlana G. Zubanova, Natalia V. Fedorova and Yana E. Sivakova. 2021). (Oye N.D. et al. 2010). E-learning in this regard, as shown by the massive growth of web technology, is significantly the learning technique in terms of schooling, training and development and a lot of corporate functions. Nevertheless, more educational organizations and business schools now take crucial moves in utilizing increasingly immersive e-learning methods to improve university students and their staff efficiently. Many developing economies are utilizing highly immersive e-learning from several education institutions that specifically increase student success (Soleymanpour J. et al., 2010). Technologies in recent times are machines used to remove physical barriers, allowing the students to study anytime and anywhere without communicating with the teacher. E-Learning increases access to efficient teaching and learning and thereby improves efficiency for students against this backdrop. E-learning encourages multiple students in higher education to pursue related programs simultaneously, (Heeger 2010) said, in addition to schooling and eventually college; education programs have now evolved to open systems for knowledge exchange.

E-learning, according to Aboderin (2015), encompasses an ample array of systems, from the teacher using visual effects to students accessing academic materials online and teaching delivered entirely with the use of computers. E-learning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom (Adam, A. N. 2023). It (e-learning) involves the use of network technologies to create, foster, deliver and facilitate learning and it encompasses face-to-face, distance, mixed and blended delivery models that utilizes electronic means, a unifying term used to describe the fields of online learning, web-based training and technology delivered instructions E-learning has received much attention from various institutions and academic scholars in the past few years. E-learning is a computer based educational system that enables learners to learn anywhere and at any time. E-learning is mostly delivered through the internet, although in the past it was delivered using a blend of computer methods like CD-Rom (Epignosis, 2014). The use of e-learning tools in respect to the learning process is critical for the successful

implementation of various learning environments (Abdullah and Azzedine, 2011). Galy, Downey and Johnson (2011) noted that modern classroom, whether online or schools-based, use e-learning tools and learning management systems that capture student cognition and engages them in the learning process via technology, while increasing their need for self-directed imperatively, the role that ICT play in the educational and learning environment and not be over emphasized. The use of ICT in the modern learning environment ranges from slide use of computers in practical aspects to an online learning experience which enhances and improves students' intellectual and learning behavior. With the introduction of computers, the precursor of our modern-day ICT, and the promising essentials of computer-based instruction and learning, many researchers and institutions ere motivated to invest viable resources so as to ensure the possibility of computers enhancing learning culture. Many authorities believe that computers should be brought into the education system because of the expectation that students would benefit qualitatively from computers by providing them with the software and hardware for an effective learning

The use of Information Communication Technology, ICT in education lends itself to more student-oriented learning settings. With the world moving rapidly into digital media and information, the influence of ICT on both education and students' learning behavior is becoming more and more important and this importance will continue to grow in the 21st century. Web Based Training and its newer and more general synonymous term E-Learning are two of today's buzz-words in the academic world (Odhiambo, 2013).

The academic performance is the level of knowledge and development of ability and skills that an individual has at a certain level of education and which generally in Joseph Sarwuan Tarka University Makurdi the e-learning tools use are online materials which play a crucial role in enhancing the student academic performance and E-modules which serve as a teaching material in e-learning and can as be used in face-to-face learning.

This study is limited to examine how the effect of e-learning on academic performance can help identify the specific needs and preferences of undergraduate student at Joseph Sarwuan Tarka University Makurdi, Benue State. This knowledge will guide the development of tailored e-learning strategies and interventions to enhance student engagement, motivation and learning outcome.

Research Questions

The following were raised to guide the study

1. What are the effect of students' utilization of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi?
2. What is the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi?
3. What are the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi?
4. What are the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi?

Research Hypothesis

HO_1 : There is no significant difference in the effect of students' utilization of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

HO_2 : There is no significant difference in effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

HO_3 : There is no significant difference in the effects of e-learning tools and student engagement in academic performance in Joseph Sarwuan Tarka University Makurdi

HO_4 : There is no significant difference in the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

2. METHODOLOGY

Research Design

The research design adopted for the study was a descriptive survey. This design is considered because it enables the researcher to generate data through the standardized collection procedures based on highly structured research instrument(s) and well defined study concepts and related variables.

Area of the Study

Makurdi Local Government Area of Benue State is the study area. The local government was established in 1927. It became headquarter of Benue State province in 1976. It is located at the latitude of 7.73^0 North and longitude of 8.54^0 . Makurdi local government area is bounded by Guma local government in the North, South by Gwer-East local Government area, in the East by Tarkaa local Government area and in the West by Gwer-West local government area. It has eleven council wards which include; Agan, Ankpa/wadata, bar, central/south mission, clerk/market, Fildi, Mbalagh, Morden market, North bank I, North bank II and Wailomayo council wards. The area is predominantly an agricultural catchment area specializing in cash crops, subsistence crops and a variety of potentials.

The major ethnic groups in Makurdi are the Tiv, Idoma and Igede. Other minor ones are Jukun and Hausa. There are also economically significant numbers of non-indigenous ethnic groups in the state such as Igbo, Yoruba and Igala who are mostly traders. The indigenous people are mostly farmers and civil servants.

The tertiary institutions in Makurdi include Joseph Sarwuan Tarkaa University, Makurdi, Benue State University Makurdi (State University), National Open University of Nigeria Makurdi, Akawe Torkula Polytechnic Makurdi, The Schools of Nursing and Midwifery in Makurdi.

Makurdi also has many secondary and primary schools including government, private and missionary schools.

Population of the Study.

The population of a study will consist of 1300 physics students from the department of Science Education in Joseph Sarwuan Tarka University Makurdi, Benue State.

Sample and Sampling Technique

A total sample size of 306 physics students from year 1 to year 3 in Joseph Sarwuan Tarka University Makurdi, Benue State.

Instrument for Data Collection

A well-constructed and self developed questionnaire titled "Effect of E-learning on Academic Performance of Undergraduate Students at Joseph Sarwuan Tarka University, Makurdi. (EEAPUS). The questionnaire was divided into two sections (A and B). Section A was for collection of information on personal data of respondents while Section B consisted of questions that elicited responses from the respondents with response options: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Validation of the Instrument

The Physics questionnaire was validated by two experts, one in Measurement and Evaluation at Joseph Sarwuan Tarka University, Makurdi, and one from Benue State University, Makurdi. The experts are requested to critically examine the questionnaire and advised the researcher on the scope, content, relevance suitability and appropriateness of the instrument in accomplishing the objective of the study.

Reliability of the Instrument

The reliability of the research instrument was determined using a split half test using the odd and even numbered items to form the two halves. The two halves was administered to a sample of students from a University not selected for the main study. The Pearson Correlation Coefficient was used to determine the reliability of the instrument. A coefficient value of 0.65 indicated that the research instrument was reliable; hence it was adopted for getting the desired information for the study.

Method of Data Collection

The researcher collected the needed data through the use of questionnaires and its administration in the selected school. The administration of the questionnaire was carried out by the researcher. A total of 160 copies of the questionnaire was distributed to elicit responses from the students and retrieved on the spot by the researcher.

Method of Data Analysis

Responses from the questionnaire were analyzed using the descriptive statistics of frequency counts and percentage, and inferential statistics of Chi-square(χ^2). Descriptive statistics of frequency counts and percentages were used in analyzing demographic variables and research questions while the inferential statistics of Chi-square(χ^2) was also used to test the stated hypothesis at 0.05 level of significance.

3. RESULT AND DISCUSSION

3.1. Results

The result of the data analyses and interpretations are presented according to the research questions asked.

Research Question One: What is the effect of students’ utilization of e-learning on students academic Performance in Joseph Sarwuan Tarka University, Makurdi Local Government Area of Benue State?

Table 1 shows the effect of students’ utilization e-learning has effect on academic Performance in Joseph Sarwuan Tarka University, Makurdi. The table shows the effect of e-learning mean score of 31.7 with standard deviation of 3.64 while the Students utilization score of 26.9 with standard deviation of 2.04. In addition, the academic performance means score of 27.6 with standard deviation of 2.47. The standard deviation at each level implies that the effect of e-learning varied widely from each other. Hence, the result means that the effect of e-learning has effect on students academic Performance in Joseph Sarwuan Tarka University, Makurdi.

Table 1: The effect of students’ utilization of e-learning on academic Performance in Joseph Sarwuan Tarka University Makurdi

Source	N	Mean	SD
The effect of e-learning	100	31.7	3.64
Students utilization	102	26.9	2.04
Academic Performance	104	27.6	2.47

Research Question Two: What is the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi?

Table 2 shows that motivation of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi. The table shows the motivation of students mean score of 18.2 with standard deviation of 4.51 while e-learning has the mean score of 19.0 with standard deviation of 7.175 In addition, academic performance has mean score of 17.7 with standard deviation of 4.94 The standard deviation at each level implies that the effect of motivation of e-learning varied widely from each other. Hence, the result means that the effect of motivation of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi.

Table 2: The effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

Source	N	Mean	SD
Motivation	100	18.2	4.51
E-learning	102	19.0	7.175
Academic performance	104	17.7	4.94

Research Question Three: What are the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi?

Table 3 shows that the effects of e-learning tools and student engagement has effect on academic performance in Joseph Sarwuan Tarka University Makurdi

The table shows the e-learning tools mean score of 27.0 with standard deviation of 3.16 while the student engagement mean score of 22.6 with standard deviation of 2.31. In addition, the academic performance has the mean score of 23.6 with standard deviation of 2.8. The standard deviation at each level implies The effects of e-learning tools and student engagement on academic performance varied widely from each other. Hence, the result means the effects of e-learning tools and student engagement has effect on academic performance in Joseph Sarwuan Tarka University, Makurdi

Table 3: The effect of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi

Source	N	Mean	SD
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e-learning tools	100	27.0	3.16
student engagement	102	22.6	2.31
academic performance	104	23.6	2.8

Research Question Four: What are the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi?

Table 4 shows that the factors affecting e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi. The table shows the factors affecting mean score of 63.04 with the standard deviation of 7.6 e-learning mean score of 31.45 with standard deviation of 5.7 In addition; academic performance has the mean score of 52.5 with standard deviation of 7.2. The standard deviation at each level implies that students’ performance varied widely from each other. Hence, the result means that the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State.

Table 4: The factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

Source	N	Mean	SD
factors affecting	75	63.04	7.6
e-learning	42	31.45	5.7
academic performance	73	52.5	7.2

3.2. Test of Hypothesis

H₁: There is no significant difference in the effect of students’ utilization of e-learning on academic Performance in Joseph Sarwuan Tarka University Makurdi

Table 5 revealed that the effect of students’ utilization of e-learning has no significant effect on academic Performance in Joseph Sarwuan Tarka University Makurdi

The table showed the effect of students’ utilization of e-learning on academic Performance in Joseph Sarwuan Tarka University Makurdi mean score of 26.6 and standard deviation of 7.44. The t-cal is 1.42 and t-critical is 0.98, while the p-value is 0.000 (P<0.005). This means that the effect of students’ utilization of e-learning on academic Performance in Joseph Sarwuan Tarka University Makurdi. Subsequently, the null hypothesis which states that the effect of students’ utilization of e-learning on academic Performance in Joseph Sarwuan Tarka University Makurdi, is hereby rejected.

Table 5: Summary of one sample t-test on the effect of students’ utilization of e-learning on academic Performance in Joseph Sarwuan Tarka University Makurdi.

Variable	N	Mean	SD	t-cal	df	t-critical	P-value	Decision
the effect of students’ utilization of e-learning on academic Performance	306	26.6	7.44	1.42	0.005	0.98	0.00	Rejected

H₂: There is no significant difference in the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi

Table 6 revealed the effects of e-learning tools and student engagement on academic performance has effect on academic performance in Joseph Sarwuan Tarka University Makurdi. The table showed the performance mean score of 16.3 and standard deviation of 54.8. The t-cal is 81.86 and t-critical is 0.98 while the p-value is 0.002 ($P < 0.005$). This means that the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State.

Subsequently, the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State. Is hereby rejected.

Table 6: Summary of one sample t-test on the effects of e-learning tools and student engagement on academic performance in Joseph Sarwuan Tarka University Makurdi

Variable	N	Mean	SD	t-cal	df	t-critical	P-value	Decision
e-learning tools and student engagement on academic performance	306	16.3	54.8	81.86	305	0.98	002	Rejected

H₃: There is no significant difference in the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi.

Table 7 revealed the factors affecting e-learning has effect on the academic performance in Joseph Sarwuan Tarka University Makurdi. The table showed the factors affecting e-learning on academic performance of mean score of 11.79 and standard deviation of 4.83. The t-cal is 4.410 and t-critical is 0.98, while the p-value is 0.004 ($P < 0.005$). This means that the factors affecting e-learning has effect on the factors affecting e-learning on academic performance in Makurdi Local Government Area of Benue State. Subsequently, the null hypothesis which states that the factors affecting e-learning has no significant effect on academic performance in Makurdi Local Government Area of Benue State. Is hereby rejected

Table7: Summary of one sample t-test on the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

Variable	N	Mean	SD	t-cal	df	t-critical	P-value	Decision
factors affecting e-learning non academic performance	306	11.79	4.83	4.410	305	0.98	004	Rejected

H₄: The effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

Table 8 revealed that the effect of motivation of e-learning on academic performance has effect on academic performance in Joseph Sarwuan Tarka University Makurdi. The table showed the effect of motivation of e-learning on academic performance mean score of 27.5 and standard deviation of 6.33. The t-cal is 4.09 and t-critical is 0.98, while the p-value is 0.001 ($P < 0.005$). Consequently, the null hypothesis is rejected. This means the effect of motivation of e-learning has significant effect the effect of motivation of e-learning on academic performance. The null hypothesis is hereby rejected

Table 8: Summary of one sample t-test on the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi

Variable	N	Mean	SD	t-cal	df	t-critical	P-value	Decision
the effect of motivation of e-learning on academic performance	306	27.5	6.33	4.09	305	0.98	001	Rejected

4. DISCUSSION OF FINDINGS

Finding on research question one revealed that the effect of students' utilization of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State. In addition, finding on hypothesis one revealed that the p-value of 0.000 was less than 0.05 level of significance. Hence, the null hypothesis which stated that the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State was rejected. This implied that the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State. This finding agrees with the finding of Ismail (2011) and Bashir (2009) that e-learning has a significant influence on academic performance in Joseph Sarwuan Tarka University Makurdi.

Finding on research question two revealed that the effect of motivation of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi. Additionally, finding on hypothesis two revealed that the p-value of .002 was less than 0.05 level of significance. Therefore, the null hypothesis which stated that the effect of motivation of e-learning has no significant effect on academic performance was rejected. This means that the effect of motivation of e-learning has a significant effect on academic performance in Joseph Sarwuan Tarka University Makurdi. This finding is in line with a lot of researchers some of which are Kanno and Francis (2009), that the effect of motivation of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi.

Finding on research question three showed that the effects of e-learning tools and student engagement has effect on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State. Additionally, finding on hypothesis three revealed that the p-value of .004 was less than 0.05 level of significance. Hence, the null hypothesis which stated that e-learning has no significant effect on academic performance in Joseph Sarwuan Tarka University Makurdi was rejected. This means that the effect of motivation of e-learning has effect on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State. This finding is in line with the finding of Peker (2009), whose study revealed that there were statistically significant differences regarding the effect of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi. His finding established that the effect of motivation of e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi.

Finding on research question four revealed that the factors affecting e-learning on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State. Moreover, finding on hypothesis four revealed that the p-value of 0.001 was less than 0.05 level of significance.

Therefore, the hypothesis which stated that the effect of motivation of e-learning has no significant effect on academic performance in Joseph Sarwuan Tarka University Makurdi in Benue State was rejected. This means that the effect of motivation of e-learning has a significant effect on academic performance in Joseph Sarwuan Tarka University Makurdi Local Government Area of Benue State.

5. CONCLUSION

Without the adequate motivation of e-learning on academic performance of students in Joseph Sarwuan Tarka University Makurdi, the study concluded that acquisition of relevant e-learning is vital to teachers as it allows the teachers to gain experience that is useful. It was also concluded that lack of e-learning tools has strong influence on academic performance in Joseph Sarwuan Tarka University Makurdi.

Despite this, there is much evidence that the e-learning perspective is fundamentally sound as a basis for understanding learning in science and for planning science curriculum and teaching, even if developing effective e-learning pedagogy has sometimes proved to be far from straightforward (Pritchard & Woollard, 2010; Sjøberg, 2010). Remains both a key referent for science education pedagogy and a major driver for research, but it no longer dominates research activity in the field to the extent it once did. For one thing there has been a shift towards focusing more on the social and cultural aspects of teaching strategy on academic performance of undergraduate students through perspectives such as cultural historical activity theory (Smardon, 2009), and a shift in research attention from psychological aspects of learning to sociologically driven concerns with issues of inclusion and social equity in science classrooms (Fraser, Tobin, & MacRobbie, 2012; Mansour & Wegerif, 2013).

Continuing research in this programme is exploring the more nuanced and complex aspects of the contingent nature of science learning and how this interacts with teaching with a view to offering more sophisticated and specific guidance to science teachers on how to best teach particular science content to different groups of learners.

6. RECOMMENDATIONS

1. Since the e-learning has been found to enhance the quality of performance in physics, physics teachers should be encouraged to employ it more in the teaching of the subject. By so doing, the performance of students in the subject could be increased.
2. Workshops and seminars should be organized for teachers by education authorities of the Federal and State Ministries of Education, Institutes and Colleges of Education on the use of e-learning strategies to improve students' performance in Physics.
3. Governments and non-governmental organization should assist in providing functional infrastructure and motivation for e-learning.
4. Governments should provide e-learning tools in tertiary institute

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