

EVALUATING GENDER DIFFERENCES ON THE IMPACT OF MOODLE AND EDMODO LEARNING MANAGEMENT SYSTEM PLATFORMS ON STUDENTS' ACHIEVEMENT IN WORD PROCESSING

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Abstract

This study sought to evaluate gender differences on the impact of Moodle and Edmodo platforms on mean achievement scores in Word processing skills among business education students in South-West, Nigeria. The study adopted the non-randomized pretest and posttest, control group, quasi experimental design using 3 x 2 involving intact classes for the treatments. Three null hypotheses were postulated and tested for significance at 0.05 level. Data was collected using the Word processing achievement test (WPAT) whose reliability index was found to be 0.770. Analysis of data was done using descriptive statistics (mean, standard deviation) and Analysis of Covariance (ANCOVA). Findings revealed a significant main effect of Moodle (LMS) platform on post achievement scores of participants. It was recommended among others that the use of Moodle platform be employed to improve on male and female business education students' achievement in word processing skills.

Keywords: Word processing, Gender, Moodle, Edmodo, Achievement.

Introduction

Possession of Word Processing skills is a basic requirement for securing any employment in any sector of the economy today. In particular, to serve as a secretary, an accountant, a teacher or in any other position after graduation from the business education programme; Word Processing literacy is therefore inevitable. This must be the reason why Word Processing is one of the courses that any business education trainee in the college is required to take and pass before graduation. Achievement is very important when it comes to taking decisions in education. For a long time, scores in academic achievement have been the criteria upon which effectiveness of teaching and learning processes is measured. According to Al-Anzi (2005), academic achievement has a crucial influence on, not only the students but also the people and the environment around them.

Adeboye (2014) reported that poor performance in secretarial subject was due to the adoption of traditional teaching methods. According to Roehl, Reddy and Shannon (2013); Millennials and Gen Z students, who have been raised on rapidly evolving technologies, have demonstrated "decreased tolerance" to lecture-style instruction. Integration of technology to support the conventional method is therefore desirable. There are different technology-based platforms otherwise referred to as Learning Management System (LMS) platforms. They include Canvas, Google Classroom, Moodle, Edmodo etc. Moodle and Edmodo platforms have been selected for this study because of their features, ease of use, as well as possession of features that allow teaching-learning related activities like assignments, quizzes, messages and other posts.

Gender differences in achievement have been an issue of concern in educational research. Ogundola, Agboola and Ogunmilade (2020) reported that the gender factor has assumed prominence in science, vocational and technical education discourse. Previous researches conducted by Filgona and Sababa (2017); Ogundola, Agboola, and Ogunmilade (2020), Kassab, Abu-Hijeh, Al-Shboul and Handy (2020) all reported a significant difference in achievement in favour of male students. Eze, Obidile and Okotubu (2020); Olaoye and Adu (2015); Bileanmi-Awoderu (2002), as well as Owolabi and Adaramati (2015) all reported a non-significant impact of gender on achievement.

Studies on how gender and instructional strategy interacted to impact on achievement gave different reports. Suwopoleme et al (2016); Udo and Udofia (2014); Enebechi (2021), Ukozor (2011) found a significant interaction effect of teaching method and gender on achievement with the male students performing better than their female counterparts. Filgona and Sababa (2017); Nnamani and Oyibe (2016); Zember and Blume (2011) in their various

studies also found a significant interaction effect of teaching method and gender on achievement, but this time in favour of the female students. Some other studies also found a non-significant interaction effect of teaching method and gender on achievement (Owolabi and Adaramati, 2015; Owolabi (2019); Lamidi et al, 2015; Baser, 2006; Bilesanmi-Awoderu, 2002).

It appears therefore that gender differences on the impact of teaching method on achievement from past studies have been inconclusive. Moreover, studies on gender differences on the impact of teaching method on achievement in Word Processing skills appear to be rare. This study therefore sought to evaluate gender differences on the impact of Edmodo and Moodle Learning Management System (LMS) platforms on students' achievement in Word Processing skills.

2. Purpose of the study

This research was done to evaluate the following;

- i. The extent to which the use of Moodle and Edmodo platforms will influence the students' achievement in Word Processing concepts and skills.
- ii. The influence of students' gender on their achievement in Word Processing concepts and skills.
- iii. The extent to which gender and treatment (using Moodle and Edmodo platforms) will interact to improve the students' achievement in Word Processing concepts and skills.

3. Research Hypotheses

The following were tested at a level of 0.05

1. **Ho1:** There is no significant main effect of treatment on students' achievement in Word Processing concepts and skills.
2. **Ho2:** There is no significant main effect of gender on students' achievement in Word Processing concepts and skills.
3. **Ho3:** There is no significant interaction effect of treatment (using Moodle and Edmodo platforms) and gender on students' achievement in Word Processing concepts and skills.

4. Methodology

The study adopted the non-randomized pre-test and post-test, control group, quasi-experimental design using 3 x 2. Treatment was at three levels (Moodle, Edmodo and Conventional approaches) and gender at two levels (male and female). The layout of the design is shown as follows:

Experimental group 1 – O₁ X₁ O₂

Experimental group 2 - O₁ X₂ O₂

Control group - O₁ X₃ O₂

where;

O₁=represents pre-test achievement in Word Processing concepts and skills.

O₂= represents post-test achievements in Word Processing concepts and skills.

X₁=represents group taught using Moodle approach in addition to the Conventional approach

X₂=represents group taught using Edmodo approach in addition to the Conventional approach

X₃=represents group taught with conventional method only

X₁, X₂ and X₃ are the treatments given.

Students in Federal Colleges of Education in South-Western states of Nigeria formed the population for the study. Multistage sampling was adopted for the study. The first stage was stratified sampling of the states into three strata based on common features possessed by the states. After using one of the colleges for the pilot study, each strata was left with one Federal College of Education which were used for the study. Treatments were assigned to each College purposively, based on the available facilities needed for each intervention. Intact classes of 200 level students were used in all the selected colleges. In all, the sample comprised 249 National Certificate in Education (NCE) business education students in three purposively sampled federal colleges of education in South-West, Nigeria. Data was collected using the Word processing achievement test (WPAT) before (Pre test) and after (Post test) the treatment. The reliability index of WPAT was found to be 0.770. Analysis of data was done using mean, standard deviation and Analysis of Covariance (ANCOVA).

5. Result

Hypothesis 1: There is no significant mean effect of treatment (Moodle, Edmodo and conventional teaching methods) on Business Education students' achievement in Word Processing concepts and skills.

Table 1: Analysis of Covariance (ANCOVA) of Business Education students' Achievement in Word Processing by Treatment and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4464.355	6	744.059	19.168	0.000	0.322
Intercept	3677.177	1	95590.132	94.726	0.000	0.281
Pre-achievement	1514.255	1	1514.255	39.099	0.000	0.139
Treatment	749.062	2	374.531	9.648	0.000	0.074
Gender	24.347	1	24.347	0.627	0.429	0.003
Treatment*Gender	6.438	2	3.219	0.083	0.920	0.001
Error	9394.039	242	38.818			
Total	164376.000	249				
Corrected Total	13858.394	248				

R Squared = .323 (Adjusted R Squared = .305) * Denote significant difference at 0.05 level of significance.

Table 1 shows that there is a significant main effect of treatment on Business Education students' achievement in Word Processing ($F_{(2,248)} = 9.648$; $p < 0.05$; $\eta^2 = 0.074$). This implies that treatment had a significant main effect on business education students' achievement in word processing posttest mean scores with an effect size of 7.4%. Therefore, the null hypothesis 1 is rejected. In order to determine the direction of the main effect of treatment, LSD post hoc analysis and estimated marginal means were computed and presented in the pairwise comparison table 2

Table 2: Pairwise Comparison of Business Education Students' Achievement in Word Processing Posttest Mean Score by Treatment

Treatment	Mean	N	Moodle LMS Platform	Edmodo LMS Platform	Control Group
Moodle LMS Platform	27.70	76		*	*
Edmodo LMS Platform	22.17	97	*		
Control Group	23.84	76	*		

Table 2 shows that the achievement in word processing posttest mean score of the business education students exposed to Moodle LMS platform is significantly different from that of those exposed to Control group and to the Edmodo LMS platform respectively. The table also shows that the business education students exposed to Moodle LMS platform had the highest posttest means score in word processing (mean score = 27.70). Table 2 also shows that the business education students in the control group had an achievement posttest mean score (23.84) that is also higher than that of those exposed to the Edmodo LMS platform (22.17), but the difference is not statistically significant. It can be inferred that the significant difference of treatment is between the post-test mean score of business education students exposed to Moodle LMS platform and Control group and also the difference between the post test mean scores of the Moodle LMS and those of the Edmodo LMS platform.

The findings of this study therefore means that the Moodle platform had positive effect on business education students' achievement in word processing. This may be traced to the extra treatment like videos, typing tutor pro etc, on the Moodle platform. This is in agreement with Kokoc and Kara (2021) who found that online learners who frequently interacted with the learning analytics demonstrated greater academic performance. Owolabi and Adaramati (2015); Olele and Williams (2012) and Carr (2000) also discovered that students who receive instructions through interactive platforms such as Moodle platform generally outperforms those who receive in traditional settings alone.

The Edmodo group in this study however, did not perform as well as the control group. This finding agrees with Grobes and Struges cited in Saibu (2002), who in a study found that students taught through the conventional teaching method achieved a mean post test score slightly higher than those taught with the audio tutorial (narration) method. It

however contradicts Gambari, Yaki, Gana and Ughovwa (2014), Okwo and Asadu (2002) and Suswan et al (2011), who reported that media inclusion in instructional strategy were found to be effective. The likely explanation for this poor performance among the Edmodo group in this study is the incessant power outage in the school used for the experiment. Since interaction on the LMS platform is dependent on power supply, there is the likelihood that the students were grossly limited in access.

Hypothesis 2: There is no significant effect of gender on Business Education students’ achievement in Word Processing.

Table 2 shows that there is no significant main effect of gender on business education students’ achievement in word processing ($F_{(1,248)} = 0.627; p > 0.05$). This implies that gender has no significant main effect on business education students’ achievement in word processing; therefore the null hypothesis 2 is accepted.

Table 3: Post Mean Score Gain Across Gender Groups

Gender	N	PreTest Score		PostTest Score		Mean Gain
		Mean	Standard deviation	Mean	Standard Deviation	
Male	54	24.175	0.887	23.54	6.922	0.41
Female	195	23.25	6.883	24.88	7.613	1.63

The findings of this study therefore show that there is no significant difference in the slightly better achievement of female students compared to their male counterparts in word processing post achievement score. The Post Test mean gain of male students was 0.41, while that of their female counterparts was 1.63. This implies that both male and female students benefitted from the treatments. The female students mean gain is however higher but no significant difference was observed.

An explanation for the insignificant better achievement of female students in word processing may be because the Business education as a course appears to be a female dominated discipline. This is obvious from the proportion of participants from each gender group (Male = 54, Female = 195). Given the proportion of participants from each gender group, it is reasonable to conclude that the discipline of Business education and word processing are areas most female folks are in love with. Since they are more interested and more of them subscribed for the course in those institutions, it is then reasonable to conclude that they will perform better than their male counterparts; nevertheless the result cannot be generalised since the difference is not statistically significant.

The finding from this study is in agreement with Adeniyi (2012); Akanmu (2019); Owolabi and Adaramati (2015); Owolabi (2019); Onyema & Olele (2020). A closer scrutiny of the research conducted by Beans, Muza & Maireva (2021) on the opinion of respondents from 5 rural secondary schools in Mirreze District in Masvingo province in Zimbabwe showed that majority of the respondents were in agreement that gender does not affect performance of learners in Business Studies at Advanced levels. This study has to do with an aspect of Business studies at a similar level (Nigeria Certificate in Education NCE), and it is experimental. The findings of Beans et al (2021) corroborates that of this study. It is therefore reasonable to conclude that in Business Education related discipline, the effect of gender is not significant.

Hypothesis 3: There is no significant interaction effect of treatment (Moodle, Edmodo and conventional teaching methods) and gender on Business Education students’ Achievement in Word Processing.

Table 1 shows that there is no significant interaction effect of treatment and gender on Business Education students’ achievement in Word Processing ($F_{(2,231)} = 0.541; p > 0.05$). This implies that treatment and gender has no significant interaction effect on Business Education students’ achievement in Word Processing; therefore the null hypothesis H₃ is accepted.

Analysis of post test scores of those in Moodle across gender, showed that female participants in the Moodle group (Mean = 29.77, standard deviation = 6.130) performed better compared to their male counterparts in the same group (Mean = 28.25, standard deviation = 6.943). The trend in the Edmodo group however differs. The male participants on that group performed better (Mean = 21.80 standard deviation 3.571) compared to their female counterparts (Mean

= 21.25, standard deviation = 4.898). The lower standard deviation of the male participants in the group further confirms that the mean represents the scores of the group better.

The trend in the conventional group is similar to that of Moodle group. These differences are however limited to the sample for the study. They cannot be generalized as they are not statistically significant. The findings of this study is in accordance with Lamidi et al (2015) Baser (2006); Ogunkola (2000) and Bilesanmi-Awoderu (2002) as they also in their different studies found no significant interaction effect of treatment and gender on achievement. The findings of this study disprove that of Filgona & Sababa (2017), Wambugu & Changeiywo (2008), Nnamani & Oyibe (2016) and Zember & Blume (2011), who in their studies found the interaction effect of treatment and gender on achievement significant; with the mean-achievement of female participants higher than that of their male counterparts. In the same way, findings from this study also disprove those of Suwopoleme et al (2016) Udo & Udofia (2014); Ogundola et al (2020) Dorine et al (2018); Mwaba et al (2015); Enebechi (2021) and Ukozor (2011); who in their different studies also found a significant interaction effect of treatment and gender on achievement; but with the male participants performing better than their female counterparts. Findings on interaction effects of treatment and gender on achievement is therefore still inconclusive.

Conclusion and Recommendations

This study evaluated the differences in the impact of Moodle and Edmodo Learning Management System (LMS) platforms on achievement in Word Processing across gender. Specifically, the main effects of Moodle and Edmodo LMS platforms as well as that of gender on achievement in Word Processing were investigated along with the effects of the interaction of treatments and gender on achievement in Word Processing. Findings from the study shows the following:

- i. A significant main effect of treatment on achievement in Word Processing;
- ii. A non-significant main effect of gender on achievement in Word Processing;
- iii. A non-significant interaction effect of treatment and gender on achievement in Word Processing.

Based on the findings of the study, it is recommended that, the Moodle LMS platform should be employed to improve on Business Education students' achievement in word processing skills. Given the reality of the new normal, students should be encouraged to develop sustainable interest in the LMS platforms, especially the Moodle platform. This can be made possible when they are used by all teachers as intervention strategies for instruction in every course. Both gender should also be given equal attention to ensure continuous use since gender as well as interaction between treatment and gender do not affect achievement significantly.

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