

Gender and Entry Background Differences in Postgraduate Distance Learners' Achievement in the Field of Educational Technology

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ABSTRACT

Several factors have been attributed to learners' underachievement in postgraduate programmes. Two of such factors are gender and entry background of postgraduate distance learners which previous studies have identified in isolation of one another. No previous studies have been reported to have investigated a combination of gender and entry background differences in educational technology. The present study, therefore, investigated the influence of gender and entry background of postgraduate distance learners' achievement in educational technology. The ex-post facto research design was adopted. Three hundred and twenty-three postgraduate distance learners who registered and sat for examinations of Master of Education in Educational Technology of National Open University of Nigeria, during the first semester of 2019_1 of 2018/2019 academic session were purposively selected from 74 study centres. The participants were made up of 215 males and 108 females. Three null hypotheses were formulated to guide the study and tested at .05 level of significance. The results of participants in 2019_1 first semester were analysed using t-test and analysis of variance (ANOVA). There was a significant difference in the mean achievement scores of male and female postgraduate distance learners in educational technology in favour of male distance learners while no significant difference was established in respect of postgraduate distance learners' entry background. The implications of this study are that gender difference is a factor of prediction to academic achievement in educational technology but entry background does not influence postgraduate distance learners' achievement in courses. Recommendations were made among others that there is need to create co-operative learning activities sensitive to preferences of female distance learners.

Key words: Gender, Entry Background, Distance Education, Achievement and Educational Technology.

INTRODUCTION

Distance education has been recognised as another possibility mode of educational provision and standard component of education. The shortcomings of the normal classroom method of education, together with other factors, paved the way for the emergence and acceptance of distance education as a standard educational provision. One of the shortcomings of the conventional education is that it makes use of the concept of learning and teaching that have kept the old methods and maintained space-time obstacles to learning. Garg and Lepotho (2009), Biao (1992), and Combs (1985) while writing on formal education, noted that it is not flexible and compliant enough to entertain as many as would need education. Apart from being costly to erect and manage, it also records a lot of wastage of its products due to poor performance at private and public examination. Open and Distance Learning (ODL) complements the conventional education system with the advancements in Information and Communication Technology (ICT) providing the driving

force. The development of distance learning seems to have been influenced by increasing need for continued skill improvement and retraining and technological advances that have made it possible to teach as many subjects as possible through virtual learning. UNESCO (2002), opines that

the term open and distance learning reflect both the fact that all or most of teaching is conducted by someone removed in time and space from the learner, and that the mission aims to include greater dimensions of openness and flexibility, whether in terms of access, curriculum or other elements of the structure. (p. 263)

The open and distance learning programmes enable learner and teacher/facilitator to interact with each other employing computers, artificial satellites, telephones, radio or television broadcasting. In Nigeria, National Open University of Nigeria (NOUN) commenced distance learning programme in 2002 principally through printed course materials and gradually embraced aspects of e-learning technology in its instructional delivery systems.

In a conventional classroom, it is possible to have students who are not of the same age bracket in knowledge just like the students of distance education programme and their teachers may not pay adequate attention to those who are above their age. The teacher may choose to keep average to good teaching where students with insufficient knowledge would not get the necessary knowledge and progress smoothly without the unpleasant feeling of their ignorance and no frustration. For the most advanced students, teaching will be boring. However, Stosic (2015) maintained that

with the application of educational technology, students can independently progress in mastering teaching materials, to choose the pace of work, to repeat the material that is not sufficiently clear, that after tests performed immediately to get results and track their progress. (p. 2)

Despite all these opportunities that educational technology offers learners, the performance of distance learners in educational technology course has been deteriorating in the recent past (Salawu & Adedapo, 2019). The researcher was able to carry out the course by course analysis of semester results from 2015_1 to 2019_1 academic sessions, percentages of failures in M.Ed (Educational Technology) at National Open University of Nigeria have been on the increase yearly. It is believed that the level of students' performance in M.Ed Educational Technology programmes in distance education is determined by several factors including gender and entry background of postgraduate distance learners admitted for M.Ed Educational Technology. Also, information is scant on the influence of gender and entry background on postgraduate distance learners' achievement in educational technology.

Gender issues seemed to have affected all aspects of the society to the extent that access of women to certain profession and competencies in higher institutions is constrained by these same sex-role stereotypes. It has been argued that this longstanding gender bias also reflects in performance levels. In the study conducted by Onuzulike (2011), on the Information and Communication Technology competencies possessed by English Language teachers in Unity Schools of south-east zone of Nigeria, he argued that gender was identified as a critical factor that affects female students to underperform on computer technology competencies. A review of studies carried out in this area shows divergent trends. For example, one of the prevailing factors as regards students' achievement is gender issue (Yusuf, Gambari & Olumorin, 2012). They reported a study carried out to investigate three instructional modes and independent setting on secondary school students' performance in Physics. Participants were 167 drawn from intact classes in Minna metropolis of Niger State, Nigeria. Findings indicated that students' gender did not influence their performance. Previous other studies have reported male dominance in achievement, but recently, the situation is reversed. Duniya (2009) reported no consistent result in the academic achievement of students in science education in respect of gender which remained unresolved. For instance, in Nigeria, in the study conducted on gender issues in mathematics by Anagbogu and Ezeliora (2007), boys and girls were exposed to different scientific trainings based on cognitive, affective and psychomotor skills and

found that girls outperform boys. Similarly, in Brunei female students outperform male students in science (McNeese, 2003). Furthermore, Ifamuyiwa and Akinsola (2008) reported that academic performance of students in Physics and Mathematics is not gender bias.

These differences seem obvious and of sex role, yet they leave a gap for scholars to fill as to why and what could account for the differences. In open and distance learning the mission aims to include a greater dimension of openness and flexibility in terms of access, curriculum or other elements of the structure. Could there be a gender difference in students' academic achievement throughout their stay in the university in open and distance learning programmes that enable learners and teachers to interact with each other using information and communication technologies, radio or television broadcasting? Hence, the need arises to establish gender differences on distance learners' achievement in educational technology with a view to find useful recommendations to the problem.

One other factor that seems to affect the academic achievement of postgraduate distance learners is student's entry background. It is a known fact that tertiary institutions in the world over, Nigeria inclusive use previous academic performance or different entry qualification/background of prospective candidates for admission into various programmes in the university, polytechnic, monotechnic and college of education. These academic performance and entry qualification/backgrounds are always of equivalent in rating or value as differences in entry qualifications for a particular university course may be strong predictors of students' educational attainment. In contrary, Zezekwa and Mudavanhu (2011) argued that different entry requirements for a course of study which result into students having different abilities may heighten the achievement gaps. However, some studies have established that no significant differences existed in the academic achievement based on entry backgrounds. For example, Miambo (2011), reported that no significant difference observed in the academic performance among students based on the admission criteria employed. In a related study, Amasuomo (2014) examined the differences between academic performances of two sets of students enrolled with different entry certificates for the same programme. Data were collected from 70 first year Technical students at the Federal College of Education (Technical), Omoku, Rivers State, Nigeria. The study established that the two sets of students differed significantly in their performances. This study was corroborated by Kyoshaba (2009) on students admitted to a programme of study, and Miambo (2011) on type of school student attended before admission into a programme. It becomes highly imperative on working on ways of closing the achievement gaps and a variety of tactics that could be employed to solve the problem. The present study at NOUN endorses this by investigating the extent to which students' entry background influences academic achievement in educational technology.

Available facts have shown that the level of students' academic achievement in distance education programmes is determined by many factors including sex stereotypes role

at home, school and work (Asrat, 2017) and background differences for entry into academic qualification (Biao, 2012) and exposure (Johnson, 2017). Many researchers in the past have reported male outperform their counterparts in science and technology courses achievements (McNeese, 2003; Onuzulike, 2011; Ofoegbu & Ikedichukwu, 2013; Raimi, 2017) and some studies equally reported female outperform male students in science-related courses. However, little or nothing is known about studies that have used a combination of gender, entry background and course wise performance in examining the achievement differences in educational technology programme. The situation therefore calls for the researcher to examine how achievement may be influenced by gender and students' entry background. To this end, the researcher wishes to investigate the gender differences in distance learners' academic achievement in M.Ed Educational Technology at the National Open University of Nigeria. The differences in the achievement scores of the three sets of students admitted into the Master of Education Programme of the National Open University of Nigeria with Science, Social Science and Humanities background certificates, was also the subject of examination of this study. This is to examine whether these sets of students differed significantly in terms of their academic achievement.

Purpose of the Study

Based on the identified research gaps and the problem statement, a need is felt to investigate whether or not significant differences exist in the academic achievement of male and female, as well as based on the entry backgrounds of M.Ed (Educational Technology) distance learners of the National Open University of Nigeria. In this regard, the study carefully analysed first semester's results of the students during 2019 academic session. The researcher seeks to meet the following research objectives in the study:

1. To determine if there is any significant difference in the mean achievement scores in educational technology between male and female postgraduate distance learners.
2. To determine if there is any significant difference in the course by course mean achievement scores in educational technology between male and female postgraduate distance learners.
3. To investigate if there is any significant difference in the course by course mean achievement scores in educational technology based on entry background of the postgraduate distance learners.

Research Hypotheses

The following null hypotheses were formulated to be tested at 0.05 level of significance:

1. There is no significant difference in the mean achievement scores in educational technology between male and female postgraduate distance learners.
2. There is no significant difference in the courses mean achievement scores in educational technology between male and female postgraduate distance learners.

3. There is no significant difference in the courses mean achievement scores in educational technology based on entry backgrounds of the postgraduate distance learners.

RESEARCH METHOD

The study is centred on postgraduate distance learners of the National Open University of Nigeria (NOUN). The expo-facto research design was adopted in the study since the independent variables (gender and student entry background) had already occurred and so were not manipulated. The target population for the study was made up of all students of Master's of Education in Educational Technology programme. A sample of 323 (215 males and 108 females) was selected through purposeful random sampling technique from 74 study centres of the NOUN. By entry qualification, 156 of them had science background, 91 had social sciences background while the remaining 76 had humanities background. These participants were those who registered and sat for the first semester of 2019_1 M.Ed in Educational Technology examinations during 2019 academic session. The results of these students who offered the courses for 2019_1 were collated and analysed using t-test statistics and analysis of variance (ANOVA).

RESULTS

H₀1: There is no significant difference in the mean achievement scores in educational technology between male and female postgraduate distance learners.

Table 1 above depicts the comparison of mean achievement scores of male and female postgraduate distance learners in educational technology. The table indicates that male distance learners obtained higher mean score in achievement (Mean = 64.4977; SD = 13.0909) than their female counterparts ($M = 58.4805$; $SD = 7.1466$). The difference was significant ($t = 4.452$, $df = 32$, $p < 0.05$) as the p -value is less than the level of significance at .05. Thus, the null hypothesis that states "There is no significant difference in the mean achievement scores in educational technology between male and female postgraduate distance learners" is rejected.

H₀2: There is no significant difference in the courses' mean achievement scores in educational technology between male and female postgraduate distance learners

Table 2 reveals that male distance learners recorded higher mean achievement scores, in six (6) out of nine (9) educational technology courses, in EDT811 ($M=72.09$), EDT812 ($M=64.97$), EDT821 ($M=58.21$), EDT831 ($M=60.69$), EDT832 ($M=56.24$) and EDT833 ($M=57.70$) than their female counterparts. These differences were, however, not significant except in EDT812 that the difference was

Table 1. t-test analysis of male and female students' achievement in educational technology mean scores

Group	n	M	SD	Std. Error mean	t	df	p
Male	215	64.4977	13.0909	0.8927	4.452	321	001
Female	108	58.4815	7.1466	0.6876			

Table 2. t-test analysis of male and female mean scores achievement in educational technology

Parameter	Students' gender	n	M	SD	Std. Error mean	t	df	p	Remark
EDT811	Male	53	72.094	11.367	1.561	0.003	86	.622	NS
	Female	35	64.914	14.216	2.402				
EDT812	Male	36	65.972	13.14	2.190	3.09	53	.008	S
	Female	19	55.895	7.355	1.687				
EDT821	Male	43	58.209	5.267	0.803	1.652	62	.132	NS
	Female	21	56.048	4.080	0.890				
EDT823	Male	31	55.581	5.327	0.956	-0.472	44	.425	NS
	Female	15	56.333	4.369	1.128				
EDT830	Male	62	56.097	4.948	0.628	-0.35	93	.726	NS
	Female	33	56.455	4.258	0.741				
EDT831	Male	121	60.694	10.459	0.950	1.009	180	.15	NS
	Female	61	59.082	9.581	1.226				
EDT832	Male	45	56.244	5.287	0.788	1.381	64	.939	NS
	Female	21	54.333	5.121	1.117				
EDT833	Male	43	57.698	5.522	0.842	3.136	62	.117	NS
	Female	21	53.381	4.341	0.947				
EDT834	Male	47	54.979	4.829	0.704	-1.279	68	.954	NS
	Female	23	56.565	4.961	1.034				

significant. Meanwhile, female distance learners had higher mean achievement scores in EDT823 ($M=56.33$), EDT830 ($M=56.46$) and EDT834 ($M=56.57$) than the male distance learners' counterparts in educational technology. In seven of the courses, the mean achievement scores of both male and female distance learners were all at the average level. In seven out of the nine courses, the data above show that the mean achievement scores of both male and female distance learners were all at the average level. Despite the differences and weak mean achievement scores recorded in these seven courses, the male distance learners recorded higher mean achievement scores and performed credibly in the remaining two courses {EDT811 ($M=72.09$) and EDT812 ($M=65.97$)} than their female counterparts. After pooling the results in all courses together it revealed that there is no significant difference in the achievement of students ($p > .05$) in eight (8) of the courses examined because the mean and standard deviation values show insignificant differences in male and female achievement scores; but there is a significant difference in the achievement of students in only one (1) course. This outcome implies that the null hypothesis that states "There is no significant difference in the courses mean achievement scores in Educational Technology among male and female postgraduate distance learners" is rejected.

H_03 : There is no significant difference in the courses mean achievement scores in educational technology based on entry background of the postgraduate distance learners.

From the Table 3 above, it is clear from the course by course analysis that there was no significant difference in the mean achievement scores of students in EDT811, EDT812, EDT821, EDT823, EDT830, EDT831, EDT832, EDT833 and EDT834 of postgraduate distance learners based on entry background. Table 4 shows the one-way ANOVA results

of the mean achievement scores of postgraduate distance learners based on entry background. From the table, the results revealed that there is no significant difference [$F(2,320) = 0.82$] in the achievement of distance learners in the three groups ($p = .44 > .05$). The mean and standard deviation values also show insignificant differences. Therefore, the hypothesis that states "There is no significant difference in the course by course mean achievement scores in educational technology based on entry background of the postgraduate distance learners" is not rejected.

DISCUSSION

The findings of the study revealed that there was a significant difference between the achievement of the male and female postgraduate distance learners in educational technology. It is to be noted that a significant difference was established in favour of the male postgraduate distance learners. The finding agrees with earlier findings of Iwendi and Oyedun (2012) that boys performed better than the girls in mathematics achievement test. The result is also supported by these studies of O'Reilly and McNamara (2007), Penner (2008), Hyde and Linn (2010) and Odagboyi (2015) that boys generally outperforming girls. It is possible to infer that the significant difference observed may be accounted for as a result of the ability of males to concentrate for longer hours while using computers, a better attention span and the fact that females like co-operative learning that requires students to research one section of the course materials and explain it to the other students. The participants were exposed to online facilitation and accessed course materials online. The online facilitation adopted is one option and there is need to complement the online facilitation with face-to-face in all courses to create

Table 3. Anova comparison of the courses achievement mean scores of the distance learners based on entry background

Parameter	Students' entry background	N	M	SD	Sum of squares	Mean square	df	F	p	Remark
EDT811	Sciences	43	71.63	12.54	490.75	245.37	2	1.47	.236	NS
	Social scs	22	67.45	13.75	14189.20	166.89	87			
	Humanities	23	66.48	12.82						
EDT812	Sciences	28	61.86	13.23	115	57.5	2	0.37	.70	NS
	Social scs	12	61.08	13.01	8164.75	157.01	54			
	Humanities	15	64.80	10.63						
EDT821	Sciences	30	57.60	5.52	25.17	12.59	2	0.50	.61	NS
	Social scs	14	58.43	4.24	1538.83	25.23	63			
	Humanities	20	56.70	4.71						
EDT823	Sciences	22	55.32	4.99	11.21	5.61	2	0.22	.81	NS
	Social scs	9	56.44	3.58	1113.40	25.90	45			
	Humanities	15	56.20	5.91						
EDT830	Sciences	45	56.2	4.77	67.32	33.66	2	1.54	.22	NS
	Social scs	25	55.08	4.86	2009.04	21.84	94			
	Humanities	25	57.40	4.28						
EDT831	Sciences	86	61.01	10.69	218.75	109.38	2	1.06	.35	NS
	Social scs	53	58.47	8.94	18522.90	103.48	181			
	Humanities	43	60.51	10.54						
EDT832	Sciences	32	55.56	5.38	7.35	3.68	2	0.13	.88	NS
	Social scs	16	56.19	4.98	1799.92	28.57	65			
	Humanities	18	55.28	5.58						
EDT833	Sciences	32	56.50	5.83	35.44	17.72	2	0.57	.57	NS
	Social scs	15	57.13	5.62	1885.50	30.91	63			
	Humanities	17	55.12	4.95						
EDT834	Sciences	34	56	5.47	36.92	18.46	2	0.77	.47	NS
	Social scs	17	55.82	3.66	1616.58	24.13	67			
	Humanities	19	54.32	4.81						

Table 4. Summary of ANOVA results of the differences in the achievement mean scores in educational

Technology based on entry background	Sum of squares	df	Mean square	F	P
Between groups	227.992	2	113.966	0.82	.442
Within group	44512.7	320	139.102		
Total	44740.7	322			

cooperative learning activities sensitive to preferences of female distance learners.

From the result of Table 2, it was found that there was no significant difference in the course by course achievement scores, except in one, of both male and female post-graduate distance learners in educational technology. It was in EDT812 that male distance learners performed better than their female counterparts and yielded a significant difference, but in other courses, there was no significant difference. The descriptive statistics in the course by course revealed that the best results are in EDT811 and EDT831 where majority of candidates had good results, with mean scores of ($M=72.09$) in EDT811 and ($M=65.97$) in EDT812 in favour of the male distance learners and with the female achievement mean scores of ($M=64.94$) in EDT811 and ($M=55.89$) in EDT812. The two courses where students recorded best results are theoretical in nature: EDT811- Theories of Communication and Philosophical Basis of Education and EDT812 – Management of Educational Resource Centres. The best achievement exhibited by the students in these courses could be attributed to the online facilitation and frequency of interaction between

the facilitators and the learners. As observed by Ni (2013) that despite noted challenges of persistence in an online environment among students, online teaching methods for research methods is less intimidating, and improves the quality and frequency of interaction between learner and instructor. This finding showed that gender did not influence the achievement of the courses in educational technology. It contradicts the findings of Wambugu and Emeke (2016) on student achievement scores in three different science subjects at the undergraduate level. This is in agreement with the finding of Ajai and Imoko (2015) who undertook a study to assess gender differences in mathematics achievement and retention scores, which showed that female students are capable of competing in mathematics. Furthermore, this finding on gender agrees with the earlier findings of Gambari, Gbodi and Olumba (2012) in primary science, and Ofili and Okore (2012) who reported that gender had no significant influence on the achievement of students in phonetics when taught with video compact disc and audio compact disc instructional packages.

The findings further indicated that there was no significant difference in the mean achievement scores of postgraduate

distance learners in educational technology based on entry background. One probable reason for this outcome was that the postgraduate distance learners have an equal level of understanding of educational technology courses that are information and communication technology inclined using residual knowledge and familiar experiences of their various backgrounds which acted as motivating factor in studying educational technology. Moreover, although the learners could have come from different entry backgrounds since they were provided with the same educational services and equipment, they were able to level up and compete favourably with one another. This finding was corroborated by Miambo (2011), who reported that no significant difference observed in the academic performance among students based on the admission criteria employed. This finding differs from the finding of Amasuomo (2014), whose study established difference between the two sets of students enrolled with different entry certificates. The finding on distance learner's entry background also agrees with the earlier findings of Geiser and Santellices (2007) on students' entry qualifications obtained before master's programmes and Kyoshiba (2009) on students admitted to a programme of study.

CONCLUSION

The influence of gender and entry background of postgraduate distance learners' achievement in M.Ed educational technology were examined. The findings of the study have led to the conclusion that males and females postgraduate distance learners' achievement in educational technology was in favour of male distance learners. It was also established that educational technology achievement is not in any manner influenced by learners' entry background. One might have expected differences to emerge in course-wise analysis of achievement based on the entry background. However, no significant difference was observed for any of the three disciplines (Sciences, Social Sciences and Humanities). In line with the outcomes of this study, the following recommendations are made:

Since the findings showed that the general performance of the postgraduate distance learners was above average, this implies that the university authorities should look for measures to improve academic performance. Such a measure is the provision of learning tools and equipment at various study centres to enhance online facilitation. Such tools and equipment may include Smartboard, VoiceBoxer, Powernoodle, Stormboard, and Protosphere.

Another measure could be an organization of face to face teaching and learning processes. This could come up at an interval of one month. This will provide an opportunity for students to ask questions and an opportunity for facilitators to provide more clarification and illustrations.

Another finding of this study is the difference in academic achievement between male and female with female lagging behind their male counterparts. It is suggested that during the face to face interludes cooperative learning techniques may be introduced to associate high-performance students with low-performance learners particularly the female. This is held to enhance the free and social learning among the learners.

In addition, Lecturers should ensure that the female distance learners improve their academic performance by providing technical support such as online one-to-one interaction, gender-friendly illustrations and examples, motivational short discussions, critical analysis of prior knowledge and generally by improving their instructional methods. These findings should be enhanced for greater generalizability by other studies in the other courses and environments.

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