

## **FEMALE DISTANCE EDUCATION UNDERGRADUATE STUDENTS' PERCEPTION OF THE EFFECTS OF INFORMATION COMMUNICATION TECHNOLOGY (ICT) USAGE ON THEIR ACADEMIC WORK**

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### **ABSTRACT**

This descriptive study was conducted to examine the extent to which female Distance Education undergraduate students use computers and the Internet and how these facilities affect their academic work. An attempt was made to identify the reasons for the apparent lack of interest by the female students in the use of ICT. The study was carried out in four public universities in Ghana.

A simple random sampling technique was used to select four hundred subjects for the study. Three hypotheses were formulated and tested using one-way ANOVA and post-hoc test. The study showed that there is a statistically significant difference among Ghanaian female Distance Education undergraduates in the usage, barriers, skills and competences in ICT. The study also established that there is a statistically significant difference in the effects of ICT use on academic work among Ghanaian female Distance Education undergraduate students. It is recommended that female Distance Education undergraduate students be encouraged to use computers in ways that will contribute to their learning.

**Keywords:** Academic work, Gender, Female Distance Education student and ICT.

### **INTRODUCTION**

Undoubtedly, Information Communication Technology (ICT) has become an emerging vehicle for creating enabling learning experiences. By extension, educational opportunities for formal, informal and non-formal groups that are traditionally excluded from education have also been enhanced. Such groups include women, girls, persons with disabilities and elderly persons (Göransson, 2017).

Other reasons of exclusion include cultural, cost implications and the limitations in accessing education via campus-based programmes.

Despite the fact that one cannot overemphasize the role and advantages of ICT in our societies, there are a number of potential issues endangering the utilization and effect of ICT in education as far as gender is concerned. It does appear that the numerous opportunities offered by ICT in education and its usage is becoming predominant skills meant for men only.

However, it also seems that much attention is not paid to the effects of these inequalities on female Distance Education students. Even though technology in education strategies like Distance Education is perceived to be bridging gaps and inequalities (Bates, 2005), little research on the area is done in the West African region.

### **Statement of the Problem**

Generally, it is perceived that fewer female undergraduates are using ICT for learning. Universities are experiencing a continued lack of interest especially by female students on Distance Education programmes using ICT for learning. This disconnect, account for why we have many barriers to use ICT for learning. It has been observed that there is lack of interest in the utilization of ICT in learning. Finally, there is no clarity to the extent to which ICT is perceived to affect the academic work of female undergraduates. This study, therefore, seeks to find answers to this phenomenon.

### **HYPOTHESES**

The following hypotheses have been formulated and tested.

- ✓ Ho 1: There is no statistically significant difference in the factors that Ghanaian female Distance Education undergraduate students perceive to be major barriers to their ability to use ICT.
- ✓ Ho 2: There is no statistically significant difference among Ghanaian female Distance Education undergraduate students in the use of ICT.
- ✓ Ho 3: There is no statistically significant difference in the effects of ICT use on academic work among Ghanaian female Distance Education undergraduate students.

### **THEORETICAL AND CONCEPTUAL FRAMEWORK**

This study is directed and underpinned by the Feminist Theory. With this theory, Feminist actors use gender lenses and other research mechanisms to analyse the subjugation of females as described by Meena (1992). Inequalities, subordination and oppression are some of the terms used by Feminist actors to show social dichotomy that has been created but impacting on access to technology by both males and females.

In African societies, in general, boys and girls are treated differently by adults from the moment they are born. Adults encourage passive and social behaviour in girls and active and independent behavior in boys. Berg (2002) in her research on gender and ICT in Norway claimed that research carried out in the last three decades in Norway has proved that new technologies like computers have not translated into improved women situations.

Somewhat, ICTs have rather been used to perpetuate the existing practices that delineate the traditional social and cultural differences between men and women.

In relation to the aforementioned, a number of research activities point that technological language is dominated with violence. The violent technological language may be a potential source of worries and concern to females which may not be readily visible to males. For instance, terminologies like *"hard disc, hard drive, reboot, cold boot, hits are permanent fatal error, and so forth. Recreational or even educational software for children often includes title words such as 'attack' or 'war'"* (Saunders, 2005, p.6).

## METHODOLOGY

### Research Design

The research design is basically a descriptive study. The descriptive study was chosen, first, to find out the characteristics of the variables of interest in a situation and then describe those characteristics.

### Population

The target population of this study was the entire female Distance Education undergraduate students in Ghana. However, the accessible population consists of female Distance Education undergraduate students of the public universities in Ghana.

In effect, four universities were purposively selected because they all run Distance Education in the country. The total accessible population of the female students in these institutions stood at 22,063.

### Sample and Sampling Technique

In each of the institutions, 25 female Distance Education undergraduate students were randomly selected to reflect each of the 4 levels of academic work. In all, 400 female undergraduate students constitute the sample size.

### Instrumentation

Structured questionnaire which was designed by the researchers was used to gather data from the respondents. The questionnaire used contained 17 close-ended items. The first three items sought to illicit demographic data from the respondents. The rest of the items dealt with the perception of ICT usage and its effect on academic work.

### Validity and Reliability

To ensure the validity of the research instrument, the questionnaire was made available to colleagues to comment on the appropriateness and clarity of the items. The reliability co-efficient which was computed using Cronbach's alpha internal reliability correlation co-efficient was found to be  $r = 0.80$ .

### Data Analysis

Data collected was represented in inferential manner using SPSS version 19. The statistical tool used to analyze the data was Analysis of Variance (ANOVA).

## RESULT OF THE STUDY

**Hypothesis 1:** It was therefore hypothesized that: There is no statistically significant difference in the factors that Ghanaian female Distance Education undergraduate students perceive to be major barriers to their ability to use ICT.

The assumption underlying this hypothesis was that female Distance Education undergraduate students usually considered certain factors inhibiting their quest to use ICT for learning.

The major barriers mentioned were: Inadequate female ICT lecturers; fewer opportunities to learn ICT skills; female students are not given special attention; and lack of ICT role-models.

One way ANOVA was used to determine whether there are institutional differences in the perceived barriers to their usage of ICT. This is captured in Table 1:

**Table 1:**  
**Institutional differences of perceived barriers to ICT usage**

Barriers to ICT usage	UCC n=100		UEW n=100		UG, Legon n=100		KNUST Kumasi n=100		F	P. Value
	M	SD	M	SD	M	SD	M	SD		
Perception of major barriers to using ICTs	3.2	2.0	2.7	1.3	4.2	1.9	2.8	1.0	26.2	.000*

P<0.05 alpha level

Table 1 shows statistically significant difference in the perceptions of the female Distance Education undergraduate students across the entire four public Universities of Ghana in respect to the barriers to their usage of ICTs,  $F(2, 495) = 26.237$   $P < .000$ . Post hoc test was run to determine the direction of the differences. The result of the post hoc test is shown in Table 2:

**Table 2:**  
**Post Hoc Test on Multiple Comparisons: Perceptions of Major barriers to women inability to use ICT. Tukey HSD**

(I) Institution	(J) Institution	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UCC, Cape Coast	UEW, Winneba	.500	.243	.241	-.17	1.17
	UG, Legon	-1.000(*)	.243	.000	-1.67	-.33
	KNUST, Kumasi	.450	.243	.346	-.22	1.12
UEW, Winneba	UCC, Cape Coast	-.500	.243	.241	-1.17	.17
	UG, Legon	-1.500(*)	.243	.000	-2.17	-.83
	KNUST, Kumasi	-.050	.243	1.000	-.72	.62
UG, Legon	UCC, Cape Coast	1.000(*)	.243	.000	.33	1.67
	UEW, Winneba	1.500(*)	.243	.000	.83	2.17
	KNUST, Kumasi	1.450(*)	.243	.000	.78	2.12
KNUST, Kumasi	UCC, Cape Coast	-.450	.243	.346	-1.12	.22
	UEW, Winneba	.050	.243	1.000	-.62	.72
	UG, Legon	-1.450(*)	.243	.000	-2.12	-.78

\* The mean difference is significant at the .05 level.

The direction of statistical difference, with regards to the major barriers to women's inability to use ICT, lies between UCC, Cape Coast and UG, Legon.

In the same vein, difference are located between and UEW, Winneba. Furthermore, the direction of difference was also observed between UG, Legon and KNUST, Kumasi.

The result of the analysis rejects the null hypothesis that there is no statistically significant difference in the factors that Ghanaian female Distance Education undergraduate students perceive to be major barriers to their ability to use ICT.

**Hypothesis 2:** There is no statistically significant difference in female Distance Education undergraduate students' skills and competences in the use of ICTs.

Analysis of variance (ANOVA) was used to test self-perceived level of competence in the use of ICT.

The major skills and competences identified include: booting and shutting down of computers, saving a document, printing of document, and opening a file. The outcome of the ANOVA analysis is shown in Table 3:

**Table 3:**

Levels of ICT skills	UCC n=100		UEW n=100		UG, n=100		KNUST n=100		F	P. Value
	M	SD	M	SD	M	SD	M	SD		
Self-rating of expertise in ICT usage.	2.8	1.1	2.7	1.2	3.1	1.2	2.4	1.1	8.5	.000*

Self-perception rating of ICT level of skills and competence  
P<0.05 alpha level

Statistically significant difference was found in the self-perception rating of ICT skills and competence among the female Distance Education undergraduate students in the four public universities,  $F(2, 495) = 8.467, p < .000$ .

To locate where the differences lie, a further analysis was done to evaluate a pair-wise differences among the means of the self-perception rating of ICT skills and competence. The result of the Tukey HSD Post Hoc test is shown in Table 4:

**Table 4:**  
Post Hoc Test on Multiple Comparisons Self-perception rating of ICT level of skills and competence, Tukey HSD

(I) Institution	(J) Institution	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UCC, Cape Coast	UEW, Winneba	.150	.158	.877	-.28	.58
	UG, Legon	-.350	.158	.176	-.78	.08
	KNUST, Kumasi	.450(*)	.158	.037	.02	.88
UEW, Winneba	UCC, Cape Coast	-.150	.158	.877	-.58	.28
	UG, Legon	-.500(*)	.158	.014	-.93	-.07
	KNUST, Kumasi	.300	.158	.320	-.13	.73
UG, Legon	UCC, Cape Coast	.350	.158	.176	-.08	.78
	UEW, Winneba	.500(*)	.158	.014	.07	.93
	KNUST, Kumasi	.800(*)	.158	.000	.37	1.23
KNUST, Kumasi	UCC, Cape Coast	-.450(*)	.158	.037	-.88	-.02
	UEW, Winneba	-.300	.158	.320	-.73	.13
	UG, Legon	-.800(*)	.158	.000	-1.23	-.37

The mean difference is significant at the .05 level.

On the whole the direction of difference in self-rating of ICT skills and competence lies between University of Cape Coast and Kwame Nkrumah University of Science and Technology, Kumasi. The direction of difference was also noted between University of Ghana, Legon on one hand and University of Education, Winneba and Kwame Nkrumah

University of Science and Technology, Kumasi on the other hand. The analysis therefore shows that the null hypothesis that there is no statistically significant difference in female Distance Education undergraduate students' skills and competences in the use of ICTs is rejected.

**Hypotheses 3:** There is no statistically significant difference in the effects of ICT use on academic work among Ghanaian female graduates.

One way ANOVA was employed to test hypothesis 3. This is shown in Table 5.

**Table 5:**  
Institutional differences of the effects of  
ICT use on academic work Tukey HSD

Perception of effect of:	UCC n=100		UEW n=100		UG, Legon n=100		KNUST Kumasi n=100		F	P. Value
	M	SD	M	SD	M	SD	M	SD		
ICT use on academic work.	1.4	0.8	1.9	1.0	1.2	0.6	2.0	0.8	7.4	.000*

The mean difference is significant at the .05 level

The data in Table 5 revealed statistically significant difference among the female Distance Education undergraduate students with regards to their view on the effects of ICT usage on academic work.  $F(2,495) = 22.290, P < .000$ .

To determine the direction of the differences, on the issues of female students' perception of the effects ICT usage on academic work, a Tukey HSD post hoc on pair-wise comparison was conducted. The result was captured in Table 5.

**Table 5: Post Hoc Test on Multiple Comparisons: Institutional Perceptual Differences of the Effects of ICT use on Academic Work.**

The analysis in Table 5 revealed that the direction of difference lies between University of Education, Winneba and the other three public Universities, viz, University of Cape Coast, and University of Ghana, Legon. Similarly, direction of difference was also established between Kwame Nkrumah University of Science and Technology, Kumasi and the other three public Universities, namely; University of Cape Coast and University of Ghana, Legon.

The implication of this analysis is that the null hypothesis that there is no statistically significant difference in the effects of ICT use on academic work among Ghanaian female graduates was rejected.

### Summary of Findings and Discussions

On the bases of the findings of this study, it was abundantly clear that female Distance Education undergraduate students have barriers to ICT usage. However, there are differences in the sort of barriers from university to university. Similarly, differences exist in the ICT skills and competences of female undergraduates in the public universities in Ghana. Finally, the respondents perceive that the rate at which ICT usage affect academic work also varies in all the public universities in Ghana.

### **Discussion of Results**

The research revealed that female Distance Education undergraduate students perceive certain factors to be major barriers restraining them from utilising ICTs in their learning. The major factors they enumerated were: Lack of ICT role-models, Inadequate female ICT lectures, less opportunities to learn ICT skills, female students are not given special attention. These factors were well supported by the available literature.

For example; female Computer Science students at *"Purdue reported in a survey that professors did not treat male and female students equally"* (Wasburn & Miller, 2005. p.164). A reasonable number of authors have proved that there are undertones of gender related issues from biases, perceptions and actions that become disincentives to females' involvement in ICT (Aggeli, & Vassala, 2016; Gatta, 2001).

The study was concluded on the basis that despite respondents having fairly good skills in basic or routine tasks such as handling of Internet and other high level skills like as attaching documents and files to mails, designing a web site creating a multimedia presentation and writing a computer programming, majority of the respondents had very low skills.

According to Spencer, Steele and Quinn (1999), female students' high performance in handling computers is linked to chance or fortune while failure is attributed to lack of ability. This finding was consistent with Heafner. Heafner's (2004) research revealed that though all students in a university owned and used their own laptops, the females preferred lower computer skills ratings compared to their male counterparts. The relevance of this findings shows that the technological or computer skills and competence of female Distance Education students have positive influence on the perception and utilization of ICT especially, in education.

The findings of the study revealed that the perception of the majority (respondents) was that using ICT has a positive effect on academic work. The findings are coherent with Khoshsima, Hosseini and Toroujeni (2017) found that computer usage by females help them perform better than their male counterparts in learning. In a similar direction, Chavez (1997) also found that computers have assisted students to become independent learners and critical thinkers which impacts positively in their learning. The above findings are key to female distance learners use of technology for their learning because technology use is dependent on perceived usefulness of technology to enhance teaching and learning. The findings also demystify the perceptions that cloud peoples' thinking on the negative effect of exposure of technology to females especially when they are studying by distance learning (Ramayah & Jantan, 2004).

Females and girls who lack role models are not likely to take up technology related programmes because in their minds, they can only see a male domineering field not privileged to females (Jepson & Perl, 2002). A number of parents have related the use of computers to males making it a disincentive to females who would have dared to venture the technological field (Shashaani, 1994). According to Kalka (2010), technology education was originally designed as a manual training with males in mind. The manual training ideology has over the years influenced the perceptions of both males and females therefore impacting on the computer use and application to learning.

Many female students considered ICT related programmes as difficult to learn. Some females underestimate their capabilities in the use of computers and technologies in general as a resulting in less confidence in taking up computer programmes (Fisher & Margolis, 2002; Volman & van Eck, 2001). Newman, Cooper and Ruble (1995) posited

that many female students are likely to be skewed in their thinking that dealing with computers and technology is the preserve of males. Johnson (2003) found out that computing continues to suffer gender stereotyping due to social misconceptions and that females themselves perceive and classify computing as a world for males.

## CONCLUSION

Generally, female Distance Education undergraduate students expressed positive attitude towards the use of ICT. However, based on the result of Self-Assessment of expertise in using computers and web, it was revealed that majority of them lack the necessary skills and confidence to use the ICT tools. The reason given was that many of them, apart from the school computers, do not have the opportunity to practice the ICT skills at home.

Even though they were aware of the positive effect ICT usage could have on academic work, they could not use it so much due to lack of the needed skills.

## Implications of the findings

It is a common knowledge that the 21st century belongs to the Information and Communication Technologies (ICTs). These findings are important because, educators and policy makers can relate to the current state of the usage of information and communication technology tools by the female Distance Education undergraduate students in an academic environment. It is also important that especially for female Distance Education undergraduate students, utilization of ICT facilities in their daily learning activities as well as in their workplaces in future is encouraged; hence prior preparation is a necessity.

## Recommendations

In view of the findings made and conclusion drawn after analyzing the data, the following recommendations deserve consideration:

University administrators and Distance Education providers should maintain high levels of ICT usage among students especially for female Distance Education students through continuous education and the promotion innovative use of ICT resources. The later, can be done through the use of seminars, conferences and training programmes as well as inviting female Information Technology (IT) personnel who would serve as role-models to the female Distance Education undergraduate students. This approach would help demystify some of the stereotypic views female students hold about the use of ICTs. Furthermore, female students should also be encouraged to use computers in ways that will contribute to their learning.

It is important to support female Distance Education undergraduate students to develop ICT skills throughout the Distance Education undergraduate programme. The training programmes should be designed on the basis of women centered demand-driven rather than a focus on technical solutions and viewpoints.

## REFERENCE

Aggeli, A. & Vassala, P. (2016). Women in Distance ELearning: 2<sup>nd</sup> Chance or 3<sup>rd</sup> Shift?. *International Women Online Journal of Distance Education*, 5(1)1, 156-162.

- Berg, V. A. L., Gansmo, H. J., Hestflatt, K., Lie, M., Nordli, H., & Sorensen, K. H. (2002). Gender and ICT in Norway: an overview of Norwegian research and some relevant statistical information. Report for Strategies of Inclusion: Gender and the Information Society, available at: [www.rcss.ed.ac.uk/sigis/public/deliverables D, 2](http://www.rcss.ed.ac.uk/sigis/public/deliverables_D,2).
- Buckley, J. (1988). Hard disc, RAM-drive, cold boot and score... or why Sally won't compute. Unpublished Research review, Teachers College, Columbia University, New York.
- Chavez, C. (1997). Students take flight with Daedalus: Learning Spanish in a networked classroom. *Foreign Language Annals*, 30 (1), 27-37.
- Fisher, A. and Margolis, J. (2002): Unlocking the Clubhouse: the Carnegie Mellon Experience. *Inroads - SIGSCE Bulletin*, 34(2):79-83
- Gatta, M. (2001). Women and work: Prospects for parity in the new economy. New Brunswick, NJ: Center for Women and Work, Rutgers University.
- Göransson, B. (2017). Role of Universities for Inclusive Development and Social Innovation: Experiences from Sweden. In *Universities, Inclusive Development and Social Innovation* (pp. 349-367). Springer International Publishing.
- Khoshsima, H., Hosseini, M., & Toroujeni, S. M. H. (2017). Cross-Mode Comparability of Computer-Based Testing (CBT) Versus Paper-Pencil Based Testing (PPT): An Investigation of Testing Administration Mode among Iranian Intermediate EFL Learners. *English Language Teaching*, 10(2), 23.
- Meena, R. (1992). *Gender in Southern Africa: Conceptual and Theoretical Issues*. Harare: Jongiwe Printers.
- Jepson, A., & Perl, T. (2002). Priming the pipeline. *ACM SIGCSE Bulletin*, 34(2), 36-39.
- Newman, L. S., Cooper, J., & Ruble, D. N. (1995). Gender and computers. II. The interactive effects of knowledge and constancy on gender-stereotyped attitudes. *Rex Roles*, 33(5/6), 325-351.
- Ramayah, T., & Jantan, M. (2004). Internet usage among Malaysian students: The role of demographic and motivational variables. *PRANJANA: The Journal of Management Awareness*, 7(2), 59-70.
- Sanders, J. (2005). Gender and technology in education: What the research tells us. In *Proceedings of the international symposium on Women and ICT: creating global transformation* (p. 6). ACM.
- Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of experimental social psychology*, 35(1), 4-28.
- Volman, M., & van Eck, E. (2001). Gender equity and information technology in education: The second decade. *Review of educational research*, 71(4), 613-634.
- Wasburn, M. H., & Miller, S. G. (2006). Still a chilly climate for women students in technology: A case study. *Women, gender and technology*, 60-79.