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Demographic and Socio-Economic Attributes as Determinants of Information and Communication Technology Use for Scholarly Communication in Nigerian Universities

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Introduction

Scholarly communication has been defined as the system through which research and other scholarly writings (new knowledge) are created, evaluated for quality, disseminated to the scholarly community and preserved for future use (Association of College and Research Libraries, 2003). Shaughnessy (1989) defined it as a social phenomenon whereby intellectual and creative activity is passed from one scholar to another, while Parekh (2000) described it as a process through which scholars convey their knowledge to, and exchange ideas with each other and future generations. Case (2002) sees scholarly communication as the process by which scholars and scientists conduct their research and make the results of their work known. From the definitions scholarly communication can be defined as the process whereby knowledge is created, evaluated, disseminated and preserved to support the universities' research, teaching and service mission of the institution. This paper will deal more with knowledge generation and communication.

Traditionally knowledge is generated or created through research carried out in universities, research institutes, business and industrial establishments, or through experts' views and positions. Such a research is conducted in libraries, laboratories, workshops, and in the field. Higher education institutions accumulate, process, and preserve research results in their lib,raries and from such accumulation, the results are exploited (Thakur, 2003). Knowledge documented and accumulated is usually accessed by people who have the skills. Such skills are readily found in academics in institutions of higher learning such as universities, polytechnics, colleges of education, research institutes, business, and industrial establishments. Ali (2005) views knowledge as verifiable and useful

information obtained through research, opinions, evidence, facts, and so on. Academics or researchers are generally expected to have acquired some degree of hands on specialist experience. An emerging fact that is often overlooked is the influence rank, years of experience, and gender have on the performance of academics.

In the present economic situation there has been inadequate funding for research, inadequate acquisition of scholarly materials in libraries, and lack of sponsorship to conferences, seminars, and workshops. To cope with this problem, academics have turned to ICT to generate and communicate knowledge. Gill (2000) defined ICT as the modern science of gathering, storing, manipulating, processing, and communicating desired types of information in a specific environment. ICT in all its forms has created opportunities for storing, organizing, accessing and disseminating knowledge (Oriaifo, 2005). The evolution of ICT has helped provide wider access to a vast volume of information and knowledge sources in a manner that is simple, easy, effective, efficient, and independent of time and subject discipline (University of Wisconsin-Madision Libraries, 1999). In spite of the numerous potentials of ICT and its provision in Nigerian universities, there is still evidence that not much knowledge is generated and communicated by academics. African Publishers' Network has revealed that Africa, including Nigeria, contributes less than 3 per cent to the books produced in the world. That means that Nigerian institutions of higher learning generate and communicate a very meagre percentage of the knowledge needed for societal transformation. This is a matter of great concern to educational administrators, educationists, and scholars in Nigerian tertiary institutions (Ochu and Egbule, 2005).

Studies have been carried out to determine the extent of ICT use by academics, the accessibility and level of ICT skills possessed by academics. The present study focuses on assessing the influence of rank, years of experience, and gender on ICT use for scholarly communication.

Rank in this study is categorized into senior (professors and associate professors), middle (senior lecturers and lecturer 1) and junior (lecturer 2 and assistant lecturer). In generating new knowledge, academics are expected to interact with their senior colleagues (professors and associate professors) by giving them research works to critique, discussing new knowledge created with them, and allowing the senior colleagues to measure their worth before making articles available to the broader community. All academics in institutions of higher learning aspire to become professors some day. To be promoted to the rank of professor, they must have outstanding records of scholarly achievement, must have achieved national leadership and in most cases international professional recognition in areas of research, education, and program development. In universities, senior lecturers generally generate more knowledge than other ranks. This view is supported by Aina & Mooko (1999) who found that senior lecturers provided the highest proportion of researches. However, Jacobs (1998) found that professors present more scientific papers at international conferences than associate professors, senior lecturers, and lecturers. But as viewed by Bottle (1994) research output of academics was not dependent on rank. Academics in the middle rank (senior lecturers and lecturer 1) work extra hard to generate and communicate knowledge that may help them get promoted to the position of professor in the shortest possible time. Professors in science and engineering faculties were found to produce more research (Okafor, 2008) while the junior rank (lecturer 2 and assistant lecturer) were said to be more amenable to ICT. Given the gap created and the fact that senior, middle, and junior academics should use ICT to generate and communicate knowledge, it is important to find out how their ranks influence the use of the technology.

The term "gender" refers to the different roles men and women play in a society or a community (Parker as cited by Riano 1994). These roles are determined by cultural, social, and economic factors and differ within and between cultures and countries. Gender roles are different from sex differences in that sex differences

are biological, and for the most part, unchangeable. Gender roles are dynamic and change over time (UNDP, 1995). Now that there is a growing number of women academics it is important to use "gender lenses" to analyze academics in the institutions. Following the views of Rathgeber (1995), although no gender-disaggregated statistics of ICT users in Africa are available, it seems likely that more men than women are users, simply because in Africa men generally have greater access to technology. Reports given by Berg, et al., (2002) and Cornelliussen (1997) for the developed world revealed that the use of ICT was higher for male than female respondents. But Aduwa-Ogiegbaen and Isah's study in 2005 at the University of Benin, which tried to investigate the role of gender in Internet use and found that there was no significant difference in the internet use by males and females. Based on these reports, there is need to find out whether gender influences ICT use for scholarly communication.

Years of experience in a university setting can be seen as years of personal involvement with teaching/research in a university. Years of experience represent how mature people are in their careers and how ready they are to embrace change. Academics vary in their years of teaching experience. To understand the influence of research/teaching experience on ICT use for knowledge generation, academics were sub-grouped according to number of years of experience. The grouping yielded the following categories of academics: 1-5, 6-10, 11-15, 16-20, and 20 and above years.

Objective of the Study

The objective of the current study is to determine the influence demographic/personal attributes (rank, years of experience and gender) have on ICT use for scholarly communication among academics in Nigeria. With the above in mind, the researcher proposed a research question and two hypotheses answered and tested at the 0.05 level of significance.

Research question

RQ1. In what ways do the demographic / personal attributes (rank, years of experience and gender) influence academics' use of ICT for scholarly communication?

Hypothesis

Ho1 There is no significant relationship between academics demographic / personal attributes (rank, years of experience and gender) and the extent f ICT use for scholarly communication.

Ho2 There is no significant interaction effect of academics' gender and years of experience on their ICT use for scholarly communication.

Method

Participants and sampling process

The study adopted an *ex-post facto* survey approach. The independent variable is information and communication technology use, while the dependent variables are rank, years of experience and gender. The independent and dependent variables had occurred prior to the current investigation hence the choice of the design. The study was conducted in five federal universities in the six geopolitical zones of Nigeria that had functional information and communication technology in their libraries. Specifically, arts, education, engineering, science and social science disciplines were used for the study.

The participants sampled numbered 502 academics using stratified random sampling method. Out of the 502 questionnaires distributed, a total of 381 were collected representing 76 per cent return; of this 301 copies were properly completed and used. Of these, 216 (71.4 per cent) were males and 86 (28.6 per cent) were females. A further breakdown of the participants showed that 102 (33.8 per cent) were senior academics, 85 (28.2 per cent) were middle academics, while 114 (38.9 per cent) of them were junior academics (lecturer 2 and assistant lecturer). The distribution of questionnaires and response rates are stated in Table 1.

Instruments

A structured questionnaire consisting of two parts was used to collect data. The first part consisted of items that measured personal and demographic variables. The second part consisted of two sections. Section one had eight items relating to the extent of ICT use for knowledge generation by academics, while Section two had eight items relating to extent of ICT use for knowledge communication by academics. The ICT studied included Internet, email, GSM handset, television, CD-ROM, websites, Audio recordings, and CDs. The participants' responses were structured on a four-point Likert response scale ranging from very large extent to very small extent. The Cronbach alpha reliability obtained for the two sections in Part Two of the instrument were 0.74 and 0.87 respectively. The validity of the instrument was established using face validation.

Table 1: Distribution of questionnaires and response rates among academics

University	Number of questionnaires distributed	Number of properly completed and used questionnaire	Percentage
Bayero University	93	51	54.8
Univ. of Benin	121	72	59
Univ. of Jos	76	46	60
Obafemi Awolowo Univ.	105	67	63
Nnamdi Azikiwe Univ.	70	42	60
Univ. of Maiduguri	37	23	62
Total	502	301	60

Data collected were analyzed for significance at .05 margin of error using chi-square and analysis of variance,

Results

The results of the data analysis obtained in testing the research question and the two null hypotheses are presented in Tables 2-8. Analysis of data in relation to the research question was undertaken so as to bring out clearly the influence of demographic/ personal attributes (rank, years of experience and gender) on academics' level of ICT use for scholarly communication. To answer the research question the extent of ICT use for knowledge generation and knowledge

communication were computed as shown in Table 2-8

Table 2: Mean Level of ICT Use for Scholarly Communication by Rank

Variable	Senior	Middle	Junior
Knowledge Generation	2.84	2.80	2.90
Knowledge Communication	2.62	2.72	2.70
Grand Mean	2.73	2.76	2.80

Results presented in Table 2 reveal that senior, middle and junior academics use ICT to a large extent for scholarly communication. The table shows that the use of ICT was highest for junior academics.

Table 3: Mean Scores of ICT Use for Scholarly Communication by Gender

Variable	Male	Female
Knowledge Generation	2.54	2.47
Knowledge Communication	2.79	2.60
Grand Mean	2.67	2.54

Table 3 shows that both male and female academics with mean scores of 2.67 and 2.54 used ICT to a large extent for scholarly communication.

Table 4: Mean Scores of ICT Use for Scholarly Communication by Years of Experience

Variable	n	Knowledge Generation	Knowledge Communication	Grand Mean
1– 5 years	72	2.81	2.52	2.66
6 – 10 years	80	2.71	2.62	2.67
11 – 15 years	77	2.91	2.69	2.80
16 + 20 years	43	3.05	2.85	2.95

20 + years	29	2.92	2.80	2.86

Results presented in Table 4 reveal that the respondents with different years of experience use ICT to a large extent for scholarly communication. However, the use of ICT was highest for academics within the bracket of 16-20 years of experience.

The hypotheses of the research were tested with chi-square and analysis of variance (ANOVA). In Table 5, the chi-square analysis was used to analyze the relationship between academics' demographic / personal attributes (rank, years of experience and gender) and level of ICT use for knowledge generation.

Table 5: Chi- Square Analysis of Academics' Demographic / Personal Attributes (Rank, Years of Experience and Gender) and ICT use for Knowledge Generation

Academics Characteristics	Chi – Square	Contingency Co-efficient	P
Gender	0.19	0.29	0.66
Rank	2.39	0.78	0.21
Years of Experience	5.81	0.60	0.02

Significant = $P < 0.05$ Not Significant = $P > 0.05$

The results of the Chi-Square in Table 5 showed that out of the three demographic attributes analyzed, a positive relationship existed between years of experience and level of ICT use for knowledge generation. This shows that academics' years of experience influence their use of ICT for knowledge generation. Rank and gender were however found not to have significant influence on the use of ICT for knowledge generation.

Table 6: Chi- Square Analysis of Academics' Demographic / Personal Attributes (Rank, Years of Experience and Gender) ICT use for Knowledge Communication

Academics Characteristics	Chi - Square	Contingency Co-efficient	P
Gender	0 .91	0 .31	0.34
Rank	0.88	0.27	0.31
Years of Experience	4.88	0.59	0.03

Significant = $P < 0.05$ Not Significant = $P > 0.05$

Table 6 showed that out of the three demographic attributes analyzed, a positive relationship existed between years of experience and level of ICT use for knowledge generation. This shows that academics' years of experience influence

their use of ICT for knowledge generation. Rank and gender were however found not to have significant influence on the use of ICT for knowledge generation.

Table 7: Result of Univariate Analysis of Variance (ANOVA) of Interaction Effect of Gender and Years of Experience on ICT use for Knowledge Generation

Source	Sum of Squares	df	Mean Square	F	Sig
Corrected Model	329.409	9	36.601	1.630	0.106
Intercept	33254.128	1	33254.128	1480.825	0.000
Gender	0.002	1	0.002	0.000	0.992
Year	23.799	4	5.950	0.265	0.900
Gender * year	62.371	4	15.593	0.694	0.596
Error	6557.293	292	22.456		
Total	164810.000	301			

Significant = P < 0.05 Not significant = P > 0.

In Table 7 the results showed that there the interaction effect of academics' gender and years of experience on the use of ICT for knowledge generation was not statistically significant. The null hypothesis is therefore not rejected. Gender and years of experience of academics were found not to have significant influence on their ICT use for knowledge generation

Table 8 : Result of Univariate Analysis of Variance (ANOVA) of Interaction Effect of Gender and Years of Experience on ICT use for Knowledge Communication

Source	Sum of Squares	df	Mean Square	F	Sig
Corrected Model	267.903	9	29.767	0.995	0.444
Intercept	30649.117	1	30649.117	1024.970	0.000
Gender	21.699	1	21.699	0.726	0.395
Year	52.979	4	13.245	0.443	0.778
Gender * year	38.698	4	9.674	0.324	0.862
Error	8731.514	292	29.902		
Total	148384.000	301			

Significant = P < 0.05 Not significant = P > 0.05

The results in Table 8 also revealed that the interaction effect of academics' gender and years of experience on the use of ICT for knowledge communication was statistically not significant. The null hypothesis is also not rejected. This shows that academics' gender and their years of experience have no significant influence on their ICT use for knowledge generation.

Discussion

It is apparent from the results that years of experience made a significant influence on ICT use for scholarly communication. The results revealed the observed Chi-Square value of 5.81for years of experience. This value was found to be statistically significant at 0.02. However, rank and gender were found not to have any influence on ICT use for scholarly communication. The Chi-Square value of 0.19 and 2.39 were found to be insignificant. This finding was in contrast to reports of Berg et al (2002) and Cornelliussen (1997) that the use of ICT was higher for males than female respondents. From this study, it seems clear that women have strengthened their relative position as users of ICT.

The findings showed that male and female academics irrespective of their years of experience were alike in regard to the use of ICT for scholarly communication. Analysis of variance (ANOVA) test revealed no statistically interaction effect between male and female academics and their years of experience. This can be explained by the fact that female academics now compete more seriously with their male counterparts in the generation and communication of knowledge to earn some elevation in their career. This view is consistent with the findings of a study by Strategies for Inclusion: Gender and the Information Society (SIGIS) where women were seen to have strengthened their relative position as user of ICT.

Implications and Recommendations

The findings in the current study are a pointer to the fact that rank of senior academics does not influence the use of ICT more than other ranks in generating and communicating knowledge. Table 2 shows that middle and junior academics demonstrate greater use of ICT for knowledge generation and communication. One possible explanation for this may be that majority of academics in the two cadres are youths who develop quicker ICT confidence, and therefore demonstrate greater ICT use. Since the findings of Jacob (1998) and Okafor (2008) revealed that professors generate more knowledge than other academics, a more pro-active step has to be taken to improve the confidence of senior academics in the use of ICT. Based on these facts training and retraining of senior academics in the use of ICT is recommended so as to allow them operate on a level playing ground with the middle and junior academics. Further investigations should be carried out to find other factors, which this study did not look into, that are responsible for rank not to have any significant influence on ICT use for scholarly communication.

The findings that gender and years of experience do not significantly influence ICT use for knowledge generation and communication imply that either male or female academics can use the technologies irrespective of years of experience to produce knowledge. It also implies that female academics are now closing the gap that existed between male and female in the use of technology for their works. Based on the findings of this study gender should not constitute any impediment to appointment of female academics to leadership positions that are technologically biased.

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