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384

Computer Proficiency Skills and Implication for curriculum transformation among Fresh Undergraduate of Botswana University

[1]Francis Joseph Ogwu and [2]Edna Nwanyiuzor Ogwu

[1]Department of Computer Science, University of Botswana, Gaborone-Botswana

[2]Department of Arts Education, Curriculum and Instruction Unit, University of Nigeria Nsukka, Nigeria

Abstract

This study determines if undergraduate students' readiness in information computer technology (ICT) significantly influences their general computer proficiency while entering the University of Botswana (UB) in order to restructure computer curriculum under General Education Curriculum (GEC) for effective learning. A total of 2370 First year students from six Faculties were used based on computer readiness and proficiency questionnaire designed. Data collected were analysed using descriptive and inferential statistics in SPSS version 17. Result revealed that students' readiness while entering UB significantly correlated ($r = -.295$, $n = 2368$ $p = .000$) inversely with their proficiency in ICT. This indicates that as students' readiness while entering UB decreases, their proficiency in ICT tend to increase. This has implications for students' development in research, library search, e-learning, conferencing, assignments, interactions and future learning in and outside the university environment. Based on findings, recommendations were made for transformation of ICT curriculum.

Keywords: Computer Skills, Curriculum, Fresh-Undergraduates, Readiness, Proficiency, Transformation

1. Introduction

The General Education Task Group in the University of Botswana was commissioned to restructure the way GEC was being offered. Report indicated that there was no baseline study to determine students' computer literacy skills when they enter UB. This makes it difficult to determine whether students could cope as independent learners using ICT. In Universities, knowledge of ICT was required in almost every course. Oliver and Towers (2000) contended that in determining the level of skills required for benchmarking tertiary learners, the need to function independently in a Web-based on-line learning environment should be a criterion.

GEC are introductory compulsory courses for every student in the university to take irrespective of gender, age or faculty affiliation. These courses are made up of computer, information systems and study skills. It is a course that equips students with the general knowledge and skills needed as a starting point in their academic pursuit in the University. The courses offered in the GEC curriculum provides diverse perspectives on how human beings think and feel, solve problems, express ideas, create and discover new knowledge. UB requires its undergraduates to take a number of GEC out of the deep conviction that living a successful and satisfying life demands a wide range of skills and knowledge.

This study therefore, determines students ICT proficiency level when they enter UB This would be regarded as a baseline curriculum for ICT assessment into UB.

in order to plan an appropriate curriculum scheme suitable for their intellectual level.

1.1 Theoretical Perspectives

Vision 2016 is a national manifesto of the Botswana government to articulate the long term economic goals for the country including strategies to meet them. ICT is a key component of the first goal, which is to be an educated and informed nation (Shafika, 2007). The long term vision is that Botswana will enter the information age on an equal footing with other nations. The Revised National policy on Education highlighted the need for all learners to be taught computer skills at all levels of school, and recommended the introduction of computer science as an optional subject at the senior secondary school and computer awareness at the Junior

secondary school level (Shakika, 2007). According to Dywer (2000), computer motivates and caters for different learning abilities. The presence of computer-based technology changes the way subjects are being taught. In various homes, computers play an essential role in students' recreation and learning and also changes the way different subjects such as science is taught (Dywer, 2000). Advancement in information technology innovations and computer usage is rapidly transforming work culture in today's classrooms (Angers & Machtmes, 2005). Getting ready to adopt and use technology and knowing how that technology can support learning must become an integral part of every institution.

1.2 Objectives of the Study

The objectives of this study therefore, are to:

1. examine the extent of students' technological readiness while entering UB.

2. determine students' Mean proficiency in various computer skills while entering UB.
3. Ascertain if students readiness influences their general proficiency in ICT skills while entering UB

1.3 The Hypothesis
For generalization purpose, the stated hypothesis below was posited.
H_1 Students readiness while entering UB, significantly determines their general proficiency in ICT.

2. Literature Review

A good deal of research has shown that every university expects new students to have appropriate basic computer skills (Oliver & Towers, 2000; McDonald, 2004). Although many institutions offer

introductory computer courses to assist students that lack the skills; some are considering eliminating introductory computer courses among students that have acquired computer knowledge through proficiency examination. A survey carried out by Eyitayo and

Eyitayo (2005) on literacy level of incoming students in the University of Botswana, revealed that almost an average were confident in basic introduction to computers, more than one third in word processing while other applications were poorly rated. A baseline study by Lumande and Fidzani (2008) also revealed that students do not adequately possess the required skills in (Microsoft (MS) PowerPoint, MS Excel, MS Access and internet) in computer when entering the University.

A survey on students self report proficiency in information technology knowledge and skills showed a significant increase in perception of skills in browsing and a decrease in database, web animation, programming, desktop publishing, digit video and audio (Kaminski, Switzer, & Gloecker, 2009). Although one may assume an undergraduate would indicate an increase in ICT skills.

Studies carried out by researchers, like Kukafka, Johnson, Linfante, and Allegrante (2003); Zhao, Pugh, Sheldon, and Byers (2002) showed that computer self-efficacy has a highly positive significant relationship towards computer usage. It is believed that ICT usage is more in developed world than in developing countries like Botswana. The prior knowledge to ICT as well as proficiency in ICT skills would be the focus of attention in order to bridge the gap in the study.

3. Design and Methodology

Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 Agree and 5 for Strongly Agree. Reliability test on the general level of ICT proficiency using 73 items was .984. ICT skills were made up of E-learning, E-mails, internet basic computer operations, basic MS word, advanced MS word, MS Excel and MS PowerPoint. This was used to test the hypothesis in the study.

This is a case study of UB undergraduate students in their first year from six different faculties (Business, Education, Engineering, Humanities, Science and Social Sciences). These were students taking fundamental computing course GEC 121(Computing and Information skills Fundamentals). The study was carried out in 2009/10 first semester academic year during the first lab session before the students were taught any computing skills. Since GEC 121 was a mandatory first year course for all year one students, the whole students were purposively selected for the study. Total number of students used based on each Faculty include: Business =199, Education= 443, Engineering and Technology = 277, Science = 482, Humanities = 493 and Social sciences = 461 with 15 missing cases. In totality, they were 2370 undergraduate students.

A computer readiness and proficiency questionnaire involving open and closed question items was developed. The questionnaire was made up of three parts. Part one involves the demographic information of students such as: Faculty, Gender, age and prior ICT educational background. Part two include both closed and open-ended 4 questions items; about students' computer readiness background on ICT. Part three comprises of section A-F to measure students computer proficiency skills in : E-learning; internet and E-mails; basic computer operations; basic and advanced Microsoft; Microsoft Excel and PowerPoint; using five scale point of measurement such as 1 for

Instruments used were face validated and tested for reliability. Reliability of students' readiness while entering UB was tested using 4 items which gave .241. Data were prepared coded and analysed using SPSS version 17. Questionnaires were analysed descriptively using frequency, percentages Mean and Standard deviation; while the

hypothesis was tested using Pearson correlation.

4. Analysis of Data and Interpretations

Table 1 shows a prior knowledge of ICT readiness among first year undergraduate students in UB. Findings revealed that majority (83%) did not do ICT in Secondary school; and for the few that claimed they did it ranged from 2000 to 2009. These topics were done under different computer science syllabus as arranged in themes such as word-processing, Microsoft word, MS excel, MS PowerPoint, spreadsheet, computer awareness, introduction to computer studies, web design, basic principles of computer, computer operating systems, ICDL, computer applications, internet networking systems, information technology, storage devices, computer hardware and soft ware, Window explorer word, e-mail, editing, components of computer, algorithms, basic concepts of IT, databases, MS office skills, programming languages, viruses, data protection and security, systems analysis, desktop, Web design graphics, typing and access.

However, 96% of the respondents claimed they had no qualifications, the few that had qualifications felt it was gotten through Certificate, Diploma, ICDL, and IGCSE/BGCSE. However, majority (61%) felt they do not understand the basic terminology and concepts of computing. Almost all (95%) believe they need to receive training in ICT usage.

Table 1: A Descriptive Statistics of ICT Readiness among Undergraduate Freshmen in UB

Variables on ICT Readiness	Rating of ICT Readiness			
	YES		NO	
	n	%	n	%
Did you do any IT course in Secondary School?	409	17.3	1967	83.0
Do you have any Computing/IT qualification?	97	4.1	2273	95.9
Do you feel you understand the basic terminology and concepts of computing?	937	39.5	1431	60.5
Do you think you should receive training in the use of computers?	2253	95.1	117	5.0

The result indicates that many students had no prior knowledge in ICT before entering UB and would like to receive training in it. Hence majority of the freshmen were not ready as far as ICT knowledge was concerned before entering UB.

Result in Table 2 showed the mean ratings for ICT usage proficiency in various skills. The perceived Mean ratings for ICT confidence skills usage in descending order from the highest to the lowest are basic MS Word, basic computer operations, E-Mail, E-learning, MS Excel, Advanced MS Word, Internet and MS PowerPoint.

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388

Table 2: Descriptive Mean Statistics on Computer Self efficacy for ICT proficiency in various skills

Variables on Proficiency skills in ICT	N	Mean	Std. Dev.
Basic Microsoft Word usage	2361	3.3862	1.60
Basic computer operations	2361	3.2176	1.51
E-Mail Usage	2361	3.0034	1.50
E-learning usability	2215	2.8414	1.41
Microsoft Excel Usage	2367	2.5987	1.83
Advanced Microsoft Word Usage	2363	2.5445	1.58
Internet usage	2364	2.4383	1.51
Microsoft PowerPoint Usage	2367	2.1032	1.77

This indicates that students were more confident and proficient in the usage of basic Microsoft word, basic computer operations and E-mails than others as illustrated in Table 2.

Hypothesis for generalization
Students' readiness while entering UB, does not significantly determines their general proficiency in ICT.

The null hypothesis was tested by relating the two variables using Pearson correlation analysis techniques. This linear relationship gave an r-value of -.295, p=.000 (see Table 4). As a result of this observation, the null hypothesis that students' readiness while entering UB, does not significantly determines their general proficiency in ICT was rejected. Hence students' readiness while entering UB, significantly determines their general proficiency in ICT. However, this was negatively correlated, which indicates an inverse relationship in the variables.

Table 3: Pearson Correlation Analysis of Students Readiness and their General Proficiency in ICT

Variable	Mean	SD	r	df	P<
Computer Readiness (X)	6.4716	.93115			
			-.295[**]	2368	.000
General ICT Proficiency (Y)	2.8068	1.18825			

*p < .05; critical r = 0.062; df = 2368
**p< .01; critical r = 0.052

This indicates that as students' readiness while entering UB decreases their proficiency in ICT tend to increase. Since students were not quite prepared in formal and informal institutions before entering UB, they tend to be very anxious and eager to have more training on the usage of various computer packages such as: e-learning, e-mail, Microsoft PowerPoint, MS excel, advanced MS word, internet, basic computer and MS word which tend to increased their computer self efficacy proficiency level in ICT.

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389

5. Discussions of Findings

This study seeks to determine the readiness in ICT knowledge and skills proficiency among first year undergraduate students of UB. Findings indicated that students were not quite technologically ready before entering the University. This converges with Eyitayo and Eyitayo (2005) and Lumande and Fidzani's (2008) findings on poor literacy level in ICT of incoming students into their respective universities. This was attributed to their poor background knowledge in ICT in various formal and informal settings.

Students' confident and proficiency level in various ICT skills such as computer operations, e-mail, internet, Microsoft (MS) word, MS Excel, MS PowerPoint and others have remained relatively very low; although, students tend to be more confident in basic MS word, basic computer operations and e-mail which are always in use and the basis for ICT knowledge. This converges with researchers, like Kukafka, Johnson, Linfante, and Allegrante (2003); Zhao, Pugh, Sheldon, and Byers (2002) that computer self-efficacy has a highly positive Significant relationship towards computer usage. Data obtained from this study showed that computer self-efficacy determines the level of confidence and proficiency students have in each computer skills. The difference in findings was based on methodology used. While one was looking at usefulness, the other was looking at readiness and computer self-efficacy.

6. Conclusions

Determination of computer baseline for fresh students entering UB becomes a priority since fresh students from UB have low proficiency background in ICT before entering UB. Although some have prior knowledge in ICT such as micro soft word, basic computer operations and e-mail which are common daily usage for all in the society.

7. Implications of the study to Learning

The university is a place of higher learning where various skills of computing are needed highly in research, library search, presentations, collaborative learning, and interactions with supervisors, assignments and a host of others. Therefore, every student should possess a minimum requirement in various computer skills such as basic computer operations, e-mail, internet, Microsoft (MS) word, MS Excel, MS PowerPoint as stipulated in computer curriculum.

Poor knowledge in ICT could be attributed to poor teacher preparation towards the usage of ICT right from the primary school. Therefore, a closer link with parents, teachers of primary and secondary schools need to be reinforced in order to motivate them about the impact of teaching and learning ICT.

Competences in the curricula and assessment schemes should be developed. Sufficient ICT support services and maintenance contracts to ensuring quality equipment for schools are indispensable conditions to achieve wider impact with ICT in teaching and learning.

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Authors Biography

[1]Francis Joseph Ogwu has a BSc degree in Computer Science in 1981, Msc in Computer science Communications in 1984, a PhD in artificial intelligence Computer science in 1990 from Obafemi Awolowo University Nigeria. He worked as a lecturer in the above University for 18 years and he is presently working at the University of Botswana as a Professor of Computer Science. He has published with many journals in Europe, America, Asia and Africa. He has attended and chaired most conference round the world. He is a Special member of IASTED (International Association of Science and Technology for Development.

[2]Edna Nwanyiuzor Ogwu has a BSc. degree in Home Economics from Delta state University in 1993, an MSc in Technology Management in 1999 from Obafemi Awolowo Universty Ile-Ife Nigeria, an Med and a PhD in Curriculum and Instruction from the University of Botswana Gaborone-Botswana in 2005 and 2010 respectively. She worked as a lecturer and a researcher with the University of Botswana and presently, she is teaching at the University of Nigeria Nsukka Nigeria where she has spent only one and half year years. She has published 16 articles with many journals in Europe, America, Asia, Australia and Africa. She has also attended a lot of conferences and a member of International Federation of Home Economics Association.