

ZJER

ZIMBABWE JOURNAL OF EDUCATIONAL RESEARCH

Volume 27 Number 3
November 2015



UNIVERSITY OF ZIMBABWE

Contents	Page
Engineering Education in Zimbabwe from Antiquity to the Present <i>D. J. Simbi</i>	335
The Importance of Play in Early Childhood Development: Implications on Design and Technology Education in Zimbabwe <i>Peter Kwaira</i>	353
Co-occurrence or Collusion: An Analysis of the Relationship between the Proposal to Ban the Use of Contraceptives and Lowering the Age of Consent in Zimbabwe <i>Barbra C. Manyarara</i>	371
Navigating New Horizons: An Analysis of Factors that Influence Computer Literacy among Undergraduate Students <i>Herbert Zirima , Takupiwa Nyanga & Priscilla Zirima</i>	394
School Head Leadership Style and Its Perceived Influence on Teachers' Performance in Bikita District Rural Secondary Schools of Masvingo Province <i>V.I. Oyedele, C. Chapwanya & D. J. Fonnah</i>	409
An Anatomy of Curriculum Innovation Failure: The Case of Political Economy in Zimbabwean Secondary School Sector <i>Manasa M. Madondo</i>	439
Primary School Composite Class Teaching and Learning Mode: Views of Some Stakeholders <i>Nyaradzo Machedze & Emmanuel Chinamasa</i>	455
Liberating Africa's Future Generations from the Myth of Redemptive Violence through Peace Education <i>Oswell Namasasu, Venesencia Mupfururirwa & Anna Mupawaenda</i>	485
Reviewer acknowledgements.....	504

Navigating New Horizons: An Analysis of Factors that Influence Computer Literacy among Undergraduate Students

Herbert Zirima , Takupiwa Nyanga & Priscilla Zirima
Great Zimbabwe University

Abstract

The purpose of this study was to assess the factors that influence computer literacy among university students. The study was primarily inspired by the realization that students acquire computer skills at varying levels and progress to use computers with varying proficiency despite the fact that they will be engaging in a similar module. A quantitative-qualitative orientation was taken in carrying out the research, particularly employing a survey research design. The study was carried out at Great Zimbabwe University, which is located in Masvingo, Zimbabwe. Thirty four (34) participants were randomly selected from a class of one hundred and eighty (180) students to participate in the study. The study revealed that students with computers at home had higher literacy levels compared to those who did not have even after completing the module. Students with a positive attitude toward computers performed relatively better than those with negative ones. Gender was not a significant variable that affected computer literacy. However, females had slightly higher levels of computer literacy when compared to males, but the difference was not significant, ($t = 0.332$, significance value = 0.747). This study recommends that learners should be exposed to computers prior to coming to university as this is a powerful determinant of computer literacy at tertiary level.

Introduction

Global trends in technological advancement especially in the field of information and communication technology (ICT) has had a crucial impact on

virtually all facets of society. Computer literacy has as such become practically indispensable especially among university students who depend on computers for their learning processes. During the learning process, students should be responsible for the management of their own information processes. After their graduation, the job market expects them to function as mobile knowledge-workers. It is therefore vital that students acquire the right skills in order to survive and deal with the continuous information flood in this information society. Computer literacy is defined as *the knowledge and ability to utilize computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving (Computerized Manufacturing Automation, 1984). Computer literacy is socially constructed and is not developed in isolation therefore socio-economic factors come into play in defining the term.*

Idowu, Adagunodo, and Idowu (2004) indicate that knowledge, skills and confidence with computer technology are now an asset for those entering the competitive employment market. Computer literacy relates to the ability to operate a computer and to understand the language used in working with a specific system or systems. According to Englehardt and Nelson (2002), computer literacy represents the ability to acquire and apply a basic understanding of current computer hardware systems and software applications to a problem in a particular work or personal setting. ICT provides the tools for the creation, collection, storage and use of knowledge as well as for communication and collaboration (Kozma, 2003). In Zimbabwe, the majority of students attend university emerging from rural backgrounds where computers are unavailable and as such their computer literacy begins at university. A number of factors interfere with how students engage with computers; these include psycho-social, economic and technological ones.

The socio-economic background of the student has an effect on how they grasp computer knowledge. In Zimbabwe, learners who emerge from rural secondary schools are disadvantaged when they commence computer literacy modules at university. This is partly because most trained teachers prefer to teach in urban schools. The majority of the teachers who end up teaching in rural areas are not computer literate (UNESCO, 2012). A large number of rural secondary schools in Zimbabwe do not have computers and those that have them may not have electricity (Alight Zimbabwe Trust, 2013). This works against the pre-university computer orientation of the rural learner. The net effect of all this is that rural youth lag behind the rest of the world in technology. Urban youth are more likely to find employment unlike their rural counterparts who have no computer skills (Alight Zimbabwe Trust, 2013). This growing disparity (or 'digital divide') is severely disadvantaging a whole generation of children growing up in rural areas.

Psychological variables also affect computer appreciation. It can be assumed that students who perceive computers as complicated are likely to find the learning process difficult. In the same vein, students with a negative attitude toward computers might not be motivated to engage in the learning process. If a student is unmotivated to work with computers, the learning result will not be optimal. A motivated computer user, even under unfavourable conditions, willingly works with a computer (Saparniene, Merkys & Saparnis, 2009). In everyday conception the level of motivation usually is measured by such notions as '*time devoted to the work with computer*' or '*the degree of efforts*'. Closely linked to motivation, is the home background of the student. Students coming from homes where computers are available are more likely to be motivated and to be comfortable around a computer than those students emanating from backgrounds where computers are unavailable.

Gender and school background are also powerful intervening factors in student's computer literacy. Hsiao and Lin (2005) engaged in a study to understand the computer literacy of college students in Taiwan and to analyse the important factors influencing their computer literacy. Among other findings, the authors established that computer literacy of male students exceeded that of female students except for security and ethics categories. In addition, the study revealed that students graduating from private schools outperformed their counterparts from public schools when it came to computer literacy. In a related study carried out at the University of Botswana by Tella and Mutula (2008), findings revealed that there are differences between female and male undergraduate students, indicating an overall advantage for male students.

Given the multiplicity of students who attend Great Zimbabwe University and the diversity of their backgrounds, this study sought to examine the factors that may intervene with students' ability to attain computer literacy.

Aim

The aim of this study was to assess the factors that influence computer literacy among university students.

Objectives

The specific objectives of this study were

- i) To assess the influence of gender on computer literacy
- ii) To evaluate the impact of socio-economic background on computer education
- iii) To assess the effect of student attitudes toward computers on their learning of computers.

Hypothesis

1. Prior exposure to computers does not have a significant effect on computer literacy.
2. There is no significant difference in the performance of males and females in computer literacy.

Research methodology

This research took a quantitative-qualitative orientation, particularly employing a descriptive survey design. The Faculty of Social Sciences at Great Zimbabwe University was selected as the sample group, particularly focusing on students studying Psychology and Human Resource Management as they were the ones doing an Introduction to Computer Studies course. Thirty four (34) participants were randomly selected from a class of one hundred and eighty (180) students to participate in the study. Thirty five percent (35%) of the participants were male undergraduate students while sixty five percent (65%) were female. The majority of the participants (68%) were in the 19 to 23 years age range. Seventeen percent (17%) were aged between 24 and 28 years. The remainder (15%) were aged between 29 and 33 years. For data gathering, the researchers used a structured questionnaire and document analysis. The researchers particularly made use of an end of course evaluation to collect the data. The statistical package for social sciences (SPSS) version 19 was used to analyse data, particularly testing the hypotheses using Analysis of Variance (ANOVA) and the Paired samples t-test.

Results and discussion

The results of this study indicated that a number of factors are influential in the attainment of computer literacy among university undergraduate students. In general, thirty nine percent (39%) of the students perceived themselves

computer literate, while fifty nine percent (59%) reported moderate computer literacy; with two percent (2%) having low computer literacy.

Home background

Fifty eight percent (58%) of the students had computers at home. Students with computers at home reported a high level of computer literacy when compared to those who do not.

Table 1

Cross-tabulation of Perceived Computer Literacy and Availability of a Computer at Home

		Perceived Computer Literacy			Total
		High	Moderate	Low	
Availability of a computer at home	Yes	9	11	1	21
	No	4	8	1	13
	Total	13	19	1	34

Forty-five percent (45%) of students with a computer at home indicated that they had a high computer literacy as compared to 30% who had no computers at home. This confirms Nash (2009) findings in a study on South African undergraduate students which showed that students coming from home backgrounds with computers and parents or older siblings who used computers were much more proficient in most computer applications than students emerging from backgrounds where computers were unavailable.

Prior exposure to computers was also seen to be an influential factor in increasing students' computer literacy. Fifty eight percent (58%) of students had prior exposure to computers before they enrolled in the Introduction to

Computers course. Fifty percent (50%) of students who had prior exposure to computers reported a high level of computer literacy when compared to only thirty percent (30%) who did not have prior exposure to computers.

Analysis of variance (ANOVA)

Table 2

ANOVA: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.019 ^a	1	.019	.096	.759
Intercept	28.325	1	28.325	145.333	.000
High	.019	1	.019	.096	.759
Error	6.042	31	.195		
Total	108.063	33			
Corrected Total	6.061	32			

a. R Squared = .003 (Adjusted R Squared = -.029)

Exposure to computers significantly affect attitudes of students toward computers, ($R = -0.029$, significance value=0.759). The researchers therefore reject the null hypothesis and conclude that prior exposure to computers has a significant effect on computer literacy.

Attitudes

The study revealed that the attitude of students determines how they in turn perform in the computer course. Seventy four percent (74%) of the students who took part in this study viewed computers as not challenging and the other twenty six percent (26%) were of the view that computers are challenging. Students who believed that computers were not challenging performed well in their course-work and also indicated that their computer literacy is high. This is illustrated in the cross-tabulation below.

Table 3*Cross-Tabulation of Perceived Computer Literacy and Perception of Students on Computers*

Perceived Computer Literacy				Total
Do you think computers are challenging	High	Moderate	Low	
Yes	3	5	0	8
No	10	13	1	24
Total	13	18	1	32

Forty-one percent (41%) of respondents who believed that computers are no challenging reported a high level of computer literacy. It is also important to note that students attitude toward computers is also influenced by availability of computers at home. This is shown by the fact that sixty-three percent (63%) of students who had computers at home viewed computers as not challenging compared to thirty-seven percent (37%) who viewed computers as challenging. The findings are line with Saparniene, Merkys and Saparnis (2009) who revealed that students having formed a positive contact with a computer (both male and female) usually demonstrate higher computer literacy level, whereas persons expressing a negative attitude are of lower computer literacy level. However, other variables are critical in analysing student attitude, for example the attitude of a child toward his teacher can also hamper the learning process. If a child hates his teacher or is irritated by his teacher's voice or some mannerism, he may really be unable to perform at his optimal (Mill, 1997).

Prior schooling

The majority of students (41%) in this study attended mission boarding schools,

and thirty-two percent (32%) attended urban day schools. Students who did their high school at private colleges reported the highest level of computer literacy followed by those who attended mission boarding schools and urban day schools. Students who attended rural day schools had the lowest perceived computer literacy. The majority of private schools and some boarding schools in Zimbabwe are well equipped in terms of computers and as such their students are likely to have prior exposure to computers by the time they leave high school. The challenge is usually with rural day schools which usually not only lack computers but also electricity, and consequently the remote possibility of exposure to computers by their students. This concurs with a study conducted by Norwalk (2012) which found out that, by exposing children to computers at schools, they may establish a culture of using technology, in which computer skills are seen as valuable and desirable. Learners from disadvantaged schools lack this exposure.

Gender

Females had a higher level of perceived computer literacy when compared to males. The results of this study revealed whilst 42% of females reported a high level of computer literacy, only 33% of males indicated that they had a high level of computer literacy.

T-test

A t- test analysis comparing the raw scores of the students who participated in the study did not show any significant difference in the performance of male compared to female students in a Microsoft PowerPoint assignment.

Table 4

Paired Samples Test

	Paired Differences					t	df	sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1: Male students-Female students raw score	1.00	9.98	3.01	-5.70	7.70	.332	10	.747

The t obtained ($t=0.332$, significance value= 0.747), indicates that there is no significant difference in the raw scores of the two groups. The researchers therefore accept the null hypothesis and conclude that there is no significant difference in the performance of males and females in computer literacy.

The above findings contradict a number of studies. For example, when Poelmans, Truyen and Deslé (2009) compared the mean scores of computer literacy and its subscales by gender, the results showed a clear pattern in both the global scale and the subscales: male students report a significant higher degree of perceived computer literacy. Luan, Aziz, Yunus, Sidek, Bakar, Meseran and Atan (2005), citing Ong and Lai, reported that males had more positive attitudes towards ICTs. Gurumurthy (2004) study also found significant gender difference in the way females and males rated themselves in their ability to master technology skills.

Age

Among undergraduate students, age was not seen as a major influential factor in computer literacy. Students of all age ranges had almost the same level of

computer literacy with the younger students (19 to 23 years age group) performing slightly better. This contradicts Smith, Bedayse, Lalwah and Paryag, (2009) who found that older students performed significantly lower on computer literacy when compared to younger undergraduate students. However, in our current learning environments in which employed students come to university, it is likely that older students can even perform much better on computer literacy due to their exposure at the workplace.

Computer applications appreciation

Majority of students (57.6%) revealed that they had moderate levels of computer literacy whilst 39.4% indicated that they had high levels computer literacy.

The majority of students (56.7%) indicated that Microsoft Excel was the most challenging application software, followed by Microsoft Access (20%).

Table 5

Appreciation of Computer Applications by Gender

	Which Computer Application was Challenging					Total
	Ms Access	Ms Excel	Ms PowerPoint	Ms Publisher	Ms Word	
Male	3	3	1	1	-	8
Female	3	14	2	1	2	22
Total	6	17	3	2	2	30

Sixty four percent (64%) of females found Microsoft Excel challenging when compared to only thirty eight percent (38%) of males who found the spreadsheet application challenging.

Most undergraduate students (40.6%) revealed that Microsoft PowerPoint was the simplest computer application during the course whilst Microsoft word was reported as the second simplest application software. Both males and females equally found Ms PowerPoint to be simple. This is in line with findings by Bulgiba and Noran (2003) who found that the highest skills among students in Malaysia related to Internet use and word processing, however, the use of databases, spreadsheet and statistical packages is much weaker.

Recommendations

- All stakeholders in education should ensure that computers are easily available to learners at primary and secondary schools by, for example, removing any duties on information and communication technology (ICT) gadgets.
- Information and communication technology (ICT) should be a compulsory subject at both primary and secondary levels of schooling. This is critical because computers are becoming necessary even at earlier levels of schooling.
- Future researchers should explore factors that influence computer literacy among primary and junior secondary school students.
- Efforts should be made to expose learners to computers prior to coming to university as this is a core element in tertiary education.

Conclusion

Availability of a computer at home, prior exposure to computers and a positive attitude toward computers are powerful influential factors in increasing computer literacy of students. The above named factors have a positive correlation as availability of a personal computer leads to a positive attitude toward computers. Female students have high perceived computer literacy when compared to males. However, there is no significant difference in their

performance when it comes to practical tests. Age is not an influential factor in increasing students' computer literacy. Spreadsheet (Microsoft Excel) and databases (Microsoft Access) were found to be challenging applications when compared to PowerPoint and Microsoft Word. Females generally find Microsoft Excel more challenging than males, whilst both males and females have an equal appreciation of Microsoft PowerPoint.

References

- Alight Zimbabwe Trust. (2013). *Annual report*. Retrieved from www.alightzimbabwetrust.org/alight/
- Computerized Manufacturing Automation. (1984). *Employment, education and the workplace*. Washington, US Congress of Technology Assessment, OTACIT-235, 234
- Englehardt, S. P., & Nelson, R. (2002). *Health care informatics: An interdisciplinary approach*. St. Louis: Mosby Press.
- Gurumurthy, A. (2004). *Gender and ICTs: An overview report*. Retrieved at <http://www.bridge.ids.ac.uk>.
- Hsiao, H. C., & Lin, Y. C. (2005). *Factors affecting computer literacy of college students in Taiwan*. Retrieved from <http://conference.nie.edu.sg/paper/Converted%20Pdf/ab00369.pdf> (13.06.2012.)
- Idowu, B., Adagunodo, R., & Idowu, B. (2004). Gender difference in computer literacy among Nigerian undergraduate students: A case study of Obafemi Awolowo University students, Nigeria. *The African Symposium: An Online Educational Research Journal*, 4(3).
- Kozma, R., (2003). ICT and educational change: A global phenomena. In R. Kozima (Ed.). *A global perspective. A report of the second information technology in education study. Module 2: International societies for technologies in education*.
- Luan, W. S., Aziz, A., Yunus, M. S. A., Sidek, Z., Bakar, K. A., Meseran, H., & Atan, H. (2005). Gender differences in ICT competencies among academicians at Universiti Putra Malaysia. *Malaysian Online Journal of Instructional Technology*.
- Mill, R., (1997). The many faces of learning to read: The role of fathers in helping their children to develop early literacy skills. *Multicultural Perspectives*, 2, 10-17.

- Nash, J., (2009). *Computer skills of first-year students at a South African university*. Proceedings of the 2009 Annual Conference of the Southern African Computer Lecturers' Association (SACLA '09).
- Norwalk, K., (2012). Examining early literacy skill differences among children in head start via latent profile analysis. *School Psychology Quarterly*, 27, 170-183.
- Poelmans, S., Truyen, F., & Deslé, R. (2009). *Perceived computer literacy among different types of undergraduate students: Findings of a survey*. 2nd International Conference of Education, Research, and Innovation, 16-18 November, 2009, Madrid, Spain. Retrieved from <http://library.iated.org/view/POELMANS2009PER>
- Saparniene, D., Merkys, G., & Saparnis, G. (2009). *Students' computer literacy and social environment in the context of the society with limited resources*. In J. Mikk, V., Meisalo, H., Kukemelk, & M. Horsley (Eds.), *Learning and Educational Media*, 3 (pp. 126–136). (ERIC Ed467429).
- Smith, W., Bedayse, S., Lalwah, S. L., & Paryag, A. (2009). Computer literacy and attitudes of dental students and staff at the University of the West Indies Dental School. *European Journal of Dental Education*, 13(3), 179-183.
- Tella, A., & Mutula, S. M., (2008). Gender difference in computer literacy among undergraduate students at the University of Botswana: Implication for library use. *Malaysian Journal of Library & Information Science*, 13 (1), 59-76.
- United Nations Organization for Education, Science and Culture (UNESCO). (2013). *EFA global monitoring report on Zimbabwe*. Retrieved from http://www.unesco.org/education/wef/countryreports/zimbabwe/rapport_0.html.



This work is licensed under a
Creative Commons
Attribution – NonCommercial - NoDerivs 3.0 License.

To view a copy of the license please see:
<http://creativecommons.org/licenses/by-nc-nd/3.0/>

This is a download from the BLDS Digital Library on OpenDocs
<http://opendocs.ids.ac.uk/opendocs/>