

# Perceived Competence of Zimbabwean Academics in the Use of Information Technology in University Academic Business

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**Abstract:** *This paper investigated digital competence as perceived by Zimbabwe in relation to four demographic characteristics. The study adopted quantitative descriptive research design. A simple random sample of 440 full time university academics responded to a structured questionnaire. Data were summarized using non parametric methods. Multiple regression and independent samples't-test were adopted to test two null hypotheses at 95% significance level. Findings revealed significant relationship between university academics' digital competence and their gender and experience in using the internet. Male academics perceived themselves as more competent than female academics. A significant inverse relationship was also observed between digital competence and age of respondents. The findings led to the conclusion that university academics were fairly competent in using the internet for research and faced challenges in using the internet as a teaching tool. University management was advised to place a premium on the use of information technology in university academic business.*

**Keywords:** Information Technology, competence, university academic, Internet, teaching.

## 1. Introduction

Information technology is one of the best human inventions that have become a topical contemporary issue in education and business across the globe. The internet and Web 2.0 technologies have particularly attracted the attention of researchers (Omoniyi and Quadri, 2013[1]; Bisht, 2013) [2]; Archibong, Ogdiji and Anijaobi-Idem, 2010 [3]. Integration of Information Technology (IT) into education is largely influenced by digital competency (Bisht, 2013) [2]; Krumsvik, 2012 [4]; Hennessy, Harrison and Wamakote, 2010[5]; Judson, 2006) [6]. Oye, Iahad and Rahim, (2011:36) [7] confirm that performance expectancy is the most influential factor for the adoption of ICT by teachers. Bandura (1977) [8] explains that perceived self efficacy influences choice of whether one engages in a task and the time they spend on that task. Since universities are the major sources of human power for national development, they are expected to transcend generating and advancing knowledge, and develop talent, person skills and transfer the technology for national development.

As computers become an intellectual prosthesis in the digital knowledge society, learning processes adopt a unique characteristic where cognitive processes are offloaded to digital artifacts (Krumsvik and Jones, 2013:174) [9]. The university academic is no longer the sole custodian of discipline knowledge rather s/he is one among the global pool of sources of knowledge at the disposal of university learners. While the internet and Web 2.0 technologies are revolutionising the way academics conduct day to day university academic business, the resulting free and easily accessible learning technologies and social software is posing complex challenges for teachers (Schmidt and Cohen , 2013 [10]; Krumsvik and Jones, 2013)[9]; Downes, 2010[11], McLoughlin and Lee, 2010[12]; Selvi, 2010[13]. Schmidt and Cohen, (2013:3) [10] note that the internet is one of the few things humans have built that they don't truly

understand. Selvi (2010) [13] therefore advocates for a continual review of teacher competence arguing that it should be done parallel with technological changes and reform studies. This paper reports on an investigation into competence of Zimbabwean university academics in using networked computers (the Internet) for research and university teaching.

This study was motivated by the observation that use of ICT in Teacher Education and the education system is very low and the industry is failing to get a graduate with both academic and person skills. In support of this, Bisht (2013:7) [2] notes that teacher training programmes at secondary school level are struggling with such problems as failure to develop higher order thinking and skill development. This observation was corroborated by literature that observed minimum use of ICT in institutions of higher education (Damodharan and Rengarajan, 2007 [14]; Iffeoma and Olusola, 2013) [15]. Literature also confirms that ICT literacy is a prerequisite in adoption of ICT in education systems (Olakulehin, 2007[16]; Archibong et al., 2010[3]; Oye et al., 2011) [7]. This is happening at the time when employers have shifted focus on what they expect employees to bring into their businesses. Employers are demanding quality education (Bisht, 2012:1) [2] that produces workforce with person soft skills as well as the discipline competencies. These can be more effectively developed through effective and innovative use of Web 2.0 technologies and the Internet. Success of these depends on the university academics' competence in using the internet both as a research and teaching tool. Universities and educational institutions are the best places for developing these skills because of the presence of this unique group hence the need to focus on the university academics

## 2. Importance of the study

Singh, Vanish and Misra (2013) [17] argue in favour of multimedia application during class interaction. Jusoh and Jusoff (2009)[18] note that use of multimedia such as transforming notes into Microsoft Power Point slides with graphics and video clip insertions has transformed students' negative attitudes to school and stimulates class interactions during teaching Islamic studies. ChanLin, Hong, Horng, Chang and Chu (2006) [19] investigated factors that influence use of technology in creative teaching among eight winners of a Creative Award in Taiwan primary and secondary schools. The study reveals that teachers use computers for teaching purposes (planning developing tests and handouts) more than for classroom activities. Computers are valued and used in all subjects using task oriented approaches that helped learners to re-package knowledge. In a separate study Saud, Buntat, Minghat and Subari (2010)[20] report that teachers who were comfortable with composing new electronic mail and assessing information from the web lacked skills of creating group addresses for electronic mail.

Employers are demanding quality education (Bisht, 2012:1) [2] that produce workforce with person soft skills as well as the discipline competence. These can be more effectively developed through effective and innovative use of the internet especially Web 2.0 technologies. Success of the development of these skills and abilities largely depends on the university academics' competence in using the internet both as a research and teaching tool. Universities and educational institutions are the best places for developing these skills because of the presence of this unique group hence the need to focus on the university academics.

## 3. Research Objectives

The study looked at two specific research objectives. Firstly, the study was conducted to investigate full time Zimbabwean university academics' IT competencies in university teaching and research and secondly, to determine predictors of perceived IT competence of Zimbabwean university lecturers in relation to using Internet as a teaching research tool. Specifically the study sought answers to the following research questions;

- What are the perceived competence of Zimbabwean University academics regarding use of IT particularly the internet in university academic business?
- What are the major predictors of perceived IT competencies of Zimbabwean University academics?

## 4. Hypotheses

- Gender, age, lecturer grade, internet experience and work experience are not significant predictors of perceived competencies of Zimbabwean university academics.
- There is no significant relationship between gender and perceived IT competence of Zimbabwean University lecturers.

## 5. Literature Review

Luan, Aziz, Yunus et al., (2005) [21] investigated perceived computer skills among 109 academics at the University of Putra, Malaysia. The study found gender differences in the ability to use word processing, Power Point presentation and World Wide Web skills in favour of females. Both male and females were not likely to develop their own home pages as they perceived the Web as a search tool than a place to publish their homepages. Hargittai and Shafer (2006) [22] established that males perceived themselves as more competent than females. Their study reveals no significant influence of age and educational qualification on self perceived online skills. Krumsvik and Jones (2013) [9] in a separate study reveal a significant gender difference in digital competence among 2,524 Upper Secondary school teachers in Norway with female teachers leading male teachers. The same study reports a significant inverse relationship between work experience and digital competence where competencies dropped at older ages.

In Nigeria, Omoniyi and Quadri (2013) [1] found that the majority of school teachers do not have the prerequisite ICT competencies. Competencies were not influenced by teaching experience and their academic qualifications. A similar study by Archibong et al., (2010) [3] reveals similar results among university academics in universities in Cross River State Nigeria. In the Sub Saharan Africa, Iffeoma and Olusola (2013) [15] identify teachers who are ready and those who totally rejected using ICT in teaching in an environment where learners are using non linear strategies for solving problems. In a similar study, Ojedokun and Owolabi (2003) [23] report that their respondents were more able to use the internet research than they did for teaching purposes.

The growing interest of the influence of the internet and Web 2.0 technologies introduces a desire to answer the topical question of whether social contemporary factors like gender, experience in using the internet and demographic factors of age and university experience are related to digital competence. There is a dearth of literature on internet related digital competencies linked to university teaching, research and demographics characteristics in Zimbabwe.

## 6. Materials and Methods

The study adopted a quantitative descriptive survey research design in consonance with the research objectives. Descriptive surveys held researchers to accurately describe phenomenon and establish relationships among variables (Kothari, 2011[24]; Saunders, Lewis and Thornhill, 2009[25]). The sample comprised 440 full time Zimbabwe University academics that were selected using the simple random sampling technique. A structured questionnaire comprising 27 items was developed for a five point ratio scale where the maximum score was 5 points. The instrument was validated through expert opinion and pilot testing. Pilot tests results were then used to determine the reliability estimate of the internal consistency using the Cronbach's alpha procedure.

Data collected from the sample were summarised using descriptive statistics. Quantitative data analyses were conducted using SPSS version 16.0. Factor analysis using Varimax rotation was executed to enable correlations to be performed. Teaching related competence was measured using seven items with item internal consistency Cronbach's alpha value 0.89. Competencies focused on using the internet and the web to preparing lectures, online assessment, applying social media software in teaching/learning and using multimedia applications and virtual learning environments. Research related competence was assessed using eleven items with internal consistency Cronbach's alpha value 0.92. Items focused on academics' ability to evaluate, locate, synthesize and build on existing information. Non parametric statistical analysis was employed to determine strength and direction of relationships. Regression analyses were conducted to predict whether demographic factors, internet experience and age could predict internet competence. Independent samples t-tests were performed to establish gender related relationships with teaching and research competencies.

## 7. Findings and Discussion

### 7.1 Demographic characteristics

Valid responses were obtained from 264 male and 176 female university academics with mean age ranging between 36 and 46 years, 6 to 10 years experience in Higher Education and more than 4 years internet experience.

### 7.2 Summary of IT Competencies of respondents

Almost a quarter (25%) perceived themselves as having one fifth of knowledge or skills required for effective use of the internet in university teaching and research. Very few, (20.7%) rated their competencies as being below average. Only 0.7% of the professors rated their internet competence as excellent or very good, or above average, 26.6% of the other grades perceived they as being excellent abilities. Mean of responses to internet competencies in Table 1 show that university lecturers have just below average (rating of 3.0) level of knowledge and skill in using internet software and tools. Female academics perceived themselves as less competent in using the internet than males for both teaching and research.

### 7.3 Competencies on use of internet for research

Almost half of the respondents reported that they could easily use e-mailing application such as zipping a file (44.6%). Scanning pictures had an overall mean rating of 3.07, SD 1.43. About 57.5% reported having challenges in scanning pictures before sending them online; 22.3% rated themselves highly competent in scanning pictures and saving them onto a computer.

Table 1 summarises the overall mean scores and standard deviations for perceived competencies of the respondents.

Table 1: Summary of IT Competencies

	IT Competence	
	Mean	Standard Deviation
<i>Gender</i>		
<i>Male academics</i>	2.99	1.02
<i>Female academics</i>	2.70	1.00
<i>Age</i>		
<i>25 - 35 years</i>	3.30	0.98
<i>36 - 46 years</i>	2.87	0.97
<i>47 - 57 years</i>	2.55	1.01
<i>58+ years</i>	2.24	0.72
<i>Grade</i>		
<i>Lecturer</i>	2.86	1.02
<i>Senior Lecturer</i>	3.06	1.03
<i>Associate/Professor</i>	2.42	0.79
<i>Experience in Higher Education</i>		
<i>0 - 5 years</i>	3.02	1.06
<i>6 - 10 years</i>	2.91	0.92
<i>11 - 15 years</i>	2.71	0.98
<i>16 - 20 years</i>	2.64	0.99
<i>21 - 25 years</i>	3.02	1.04
<i>26+ years</i>	2.24	0.97

This study revealed that formal ICT training programmes for university academics were run essentially by Library staff than ICT departments. Library awareness sessions focused on how to use university library databases. Almost one fifth of the respondents indicated that they learnt how to use the Internet through the Internet help facility or by trial and error method (39.5%). Majority of lecturers (63.4%) were taught how to use the internet by friends or colleagues and 11.1% were taught by relatives. Only 17.5% had done ICT courses prior to joining the university during high school and 24% benefitted from workshops offered by their universities. Fifty percent of the professors had less than two years experience in using the internet while almost half of the junior academics (50.7%) had more than 6 years experience.

Competence on working with attachments had the highest overall mean score of 3.78, SD 1.33 followed by the ability to use an external internet modem (mean score=3.22. SD 1.47). Only 21.82% of the respondents reported that they had no problems working with online questionnaires while 35.45% found it challenging. The majority of the respondents (64.77%) perceived it challenging to participate and present a research paper or lecture online using such media as Skype (mean 2.18 SD 1.29). They rated themselves as being below average (all ratings were below 3.0). Only 5.45% said that they were confident and able to present lectures or research papers online. The majority of respondents, irrespective of grade, reported their inability to effectively use the internet to locate relevant information using such means as meta-search engines (42.3%); 23.9% were able to use meta search engines. Only 18.9% rated themselves as having excellent knowledge and ability to gather useful websites, 43.6% rated themselves as being below average for information seeking skill. The majority of the academics use the World Wide Web as an information resources rather than a platform to publish their material and share their knowledge using blogs or wikis. The majority of (88%) did not have personal web pages, 5.5% were able to confidently create and edit a wiki page or home page (mean

2.0,SD 1.27); 83.0% rated themselves below average (mean =1.12, SD 1.27) for this ability.

**Table 2:** Summary of competencies regarding use of the internet for research and teaching

IT competence	Highly	%	Average	%	Low	%
For research	171	38.9	126	28.6	143	32.5
For teaching	61	13.9	86	19.5	293	66.6
Mean						

An analysis of results reveal a strong positive relationship between being able to use the internet for research and being able to use the same for teaching purposes (Pearson’s R= 0.66 , p<0.00 at 95% level of confidence). Those academics that were able to use the internet for research were also able to use it for teaching. However ability to use the internet for research was higher than the ability to use it for teaching (mean 3.09 SD 1.11; mean 2.16 SD 1.04 respectively). Only 13.9% of the academics perceived themselves as highly skilled in using the internet as a teaching tool, the majority (66.6 %) found it challenging. Very few (10.5%) respondents indicated a skill above average for using computer software applications and presentations that use more than one media (multimedia applications) competencies (mean 2.65 SD 1.41). The majority (58.6%) reported that they faced challenges in using the internet during classroom interactions (mean 2.37 SD 1.33); 70.7% reported that they faced challenges assessing learners using interactive marking. A few 4.1% rated themselves highly competent in using Course Management Systems.

**7.4 Hypotheses testing**

Multiple linear regression analysis was performed using the default ‘enter’ methods to test significance of regression parameters using all test variables. A one way ANOVA was used to test for significance of the resulting fitted model which is summarised in table 3.

**Table 3:** Regression analyses of competence against key variables

Variable	Competence			R <sup>2</sup>	F
	B <sub>0</sub>	Beta	Sig.		
Age	-.325	-.280	0.00	.202	36.68
Gender	-.209	-.100	0.02		
Internet experience	.278	.301	0.00		

The model explains 20.2% of the variation in competencies with age, gender and experience in using the internet and the model is good. An ANOVA result shows that models is highly significant p-value = 0.00 <0.05. An initial table of beta coefficients showed that lecturer grade and work experience are not significant and age, gender and internet experience are highly significant. This study reveals a significant inverse relationship between overall competencies and age. The relationship between IT competency and work experience is also inverse but was found to be not significant at 95% level of significance. IT competency drops with increase in age. IT competence was not significantly related to academic’s grade and work experience.

An independent samples t-test was done to compare means between the male and female academics assuming the null

hypothesis of no significant differences. The Levin’s test for equality of variances, F =1.13 was obtained. The two means are significantly different for IT competencies (t =2.92, p<0.004) at 95% level of confidence whether variances were or were not assumed equal. This result therefore shows no support for the null hypothesis that the mean for males equals mean for female lecturers or that the two means are equal. A comparison of means for research showed a significant gender difference in the means at 95% level of confidence (F=3.82, t=2.10, p<0.002). The major difference was largely due to competence related to research as there was no significant difference in means for teaching related competence.

**7.5 Discussion and Conclusions**

The purpose of education is not just making students literate but adds rational thinking, knowledge ability, and self sufficiency (Jusoh and Jusoff, 2009:86)[18] through innovative creative teaching learning strategies. The digital era requires academic teachers to meet the needs of the ‘media-centric’ university students commonly referred to as the net generation. The analysis of the data has shown that the majority of university academics have challenges in using the internet as a teaching tool. This result corroborates with Oye, et al., (2011) [7]; Archibong et al., (2010) [3]; Luan et al., (2005) [21]. Omoniyi and Quadri (2013) [1] confirm this result among high school teachers in Nigeria. The result is further supported by research reports by Luan et al., (2005)[21] that reveal that both male and female academics were equally not competent in using multimedia applications and virtual class applications both that had mean scores below 3.50. Jusoh and Jusoff (2009)[18]confirm this by reporting that many university lecturers still use the lecture method which lasts more than one hour. Damodharan and Rengarajan, (2007)[14] go on to warn university academics of possible effects of using the dry lecture methods that tends to result in students losing concentration after 15 to 20 minutes because of being passive. Oye et al., (2011) [7] notes that low adoption of ICT was due to lack of knowledge and training opportunities among other variables.

The findings were also consistent with Luan et al., (2005)[21] who confirm that word processing and e-mail are common and most frequent activities for university academics and that they use the web more as a search tool than as a place for publishing their homepages. This study finding also corroborates findings by Saud et al, 2010) [20] that teachers lack the skill of creating group addresses.

The hypothesis shows significant relationship between competencies and variables gender, age and web use experience. This study found male academics’ IT competencies higher than those of females in both teaching and research. The findings however contradict reports from Krumsvik and Jones (2013) [9]; Luan, et al., and (2005) [21]. Krumsvik and Jones (2013) [9] found out that female teachers scored higher than male teachers. Luan, et al., (2005) [21] observe that females reported higher competencies in using search engines than males and downloading files from the web. Hargittai and Shafer (2006)[22] on the contrary found no significant gender difference in the ability of men and women to search

information on the web but found level of education and experience with the medium as important predictors.

This study found no significant relationship between competencies and work experience or grade. An analysis of the results shows that the number of years one spends in higher education may not determine whether s/he will efficiently use IT or the internet in teaching or research. The study results corroborate with Omoniyi and Quandri (2013) [1] who found no significant differences between ICT competence and work experience or academic qualifications. This finding contradicts findings from Krumsvik and Jones (2013) [7] whose study report that work experience and age are related to digital competency.

This study's finding corroborates Hargittai and Shafer, (2006: 443) [22] in that women rate themselves as lower skilled than men. This study's finding is also supported by Hargittai and Shafer (2006) [22] who found that those younger users and those with more web use experience were better at finding content online. This finding has a negative influence on the extent to which academics use the Web. This has also serious implications on how much each gender is likely to benefit from the web.

## 8. Recommendations

The study has shown that information technology is undoubtedly a major tool in university teaching and research. University academics have to embrace the changing demands produced by the introduction of the internet in university academic business. This study reveals that Zimbabwean universities have largely mature people (digital immigrants) whose information technology competence is being challenged. Developing person skills such as creativity and innovation requires a radical change in university policy and teaching practice. The paper recognises that managing universities is demanding and complex. University management however should ensure congruence between university curricula and staff development otherwise the Zimbabwe University academics will remain out of the mainstream of technology in education. Management and Zimbabwe government should place a premium on information technology for university teaching and research. University management should fund staff development considering that the emergence of Web 2.0 technologies requires continuous retraining and or staff development.

The study recommends that university management should improve the staff development programmes for university academics. They should design formal training programmes that improve the pedagogical aspect of internet use as a teaching tool so that they develop innovative and creative adaptive skills of technology based teaching. Training programmes should focus on teaching based on information technology including those that teach them how to use computers. Professional development should also highlight the changing roles of the university academic and strategies to become innovative and creative among university academics. Academic staff should be encouraged to acquire lap tops or tablets so that they can access the internet from more than their offices including their homes.

## 9. Other Recommendations

Adoption of technology is influenced by perceptions and attitudes. There is need to establish university academics perceptions and attitudes towards using the Internet as a teaching and research tool.

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