

Relationship Between Internet Use and Perceived Academic Performance Among Undergraduate Students at the University of Botswana

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Abstract

The Internet holds the greatest promise for learning and universal access to quality education. The use of the Internet for education is now widely acknowledged. This study examined through an ex-post facto design the relationship between use of the Internet and perceived academic performance among undergraduate students at the University of Botswana. Three hundred and six undergraduate students from thirteen systematically selected departments formed the study sample. A modified Internet Use scale was used to gather data. The data collected was analysed using descriptive statistics, multiple correlation, chi-square and Friedman test. The results indicate that: significant relationship exists between Internet use and perceived academic performance among undergraduate students at the University of Botswana.

Most respondents use the Internet for the purpose of obtaining course related information. However, variation exists in the use of the Internet to obtain course related information with participants from Education and Humanities using the Internet for this purpose more than students from other disciplines such as social sciences, science, business, engineering, etc. Self-efficacy and prior computer experience were found to significantly correlate with Internet access and use. Various problems encountered by respondents when using the Internet include: inadequate access to the Internet during school session, slow Internet access, lack of access to computers on campus during holidays, and lack of knowledge to use the Internet and computers.

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Introduction

By and large, the quality and level of education acquired by an individual determines his contribution to national development. To understand and promote change, one requires a certain level of education as a catalyst for social, political and economic transformation (Akinboye, 1980). In any nation, education is regarded as an agent that promotes human survival. This is often justified by the huge amount of resources that most governments the world over invest in education.

A major problem faced by those who desire university education, and those who finance it, is the basic consideration of the possibility of academic success. For example, the preoccupation of a tutor is how best to enhance the success of his / her students. Parents too, are worried about their children's success in school. Similarly, learners are motivated by the prospect of success. Warnemuende and Samson (2005) point out that most parents expect their children to succeed as students. However, when they do not, parents are confused, disappointed, angry, and afraid. The lack of success in academic skills, social behaviour, or both, the recognition that their children are not doing well causes pain in parents (Warnemuende and Samson, 2005).

The use of ICT in education is generally assumed to enhance academic performance (Foltos, 2002). Since 1970s ICTs such as radio, television and telephone and recently the Internet have become increasingly integrated in education as content delivery tools within higher education worldwide (UNDP Evaluation

Office, 2001). Ogunsola (2005:3) notes that, ICT provides powerful tools for organising and analysing information and for modelling concepts and underlying structures. Similarly, Ojedokun (2001) observes that ICT facilitates the acquisition and absorption of knowledge; support the process of learning; knowledge networking, and knowledge codification. Students who use ICTs especially the Internet, gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problems outside the classroom (Jagboro, , 2003).

The integration of ICT in education improves and offers flexible learning opportunity. Additionally, effective classroom integration of ICT brings about development of various intellectual skills such as reasoning how to learn and creativity (Eadie, 2001). In the same vein, Rittard, Bamnister, and Dunn (2003) in a research on ICT use in education in UK found that generally, there was a positive impact on the attainment of students who made high use of ICT particularly the Internet.

Internet use in Education

The use of the Internet in learning allows students to broaden their academic experiences, access important information, and communicate with counterparts within the immediate and wider academic community. For example, using a standard web browser, students can easily access academic information such as course schedules, grades, unofficial transcripts, and search for courses that they are interested in pursuing. Students also use the Internet to gain access to multiple references, increase student knowledge, inquiry, and depth of investigation (Ojedokun, 2001). The Internet is a valuable source of information used by students in projects and assignments. Moreover, the Internet serves as a useful tool for lecturers in helping to prepare lesson plans using a number of sites dedicated to providing educational material. According to the literature, teachers and students are the users of the Internet. Jones and Madden conducted a study on college students' Internet usage. Browsing the Internet was a daily activity; 73% of college students used the Internet more than for research. Seventy-nine percent of the students agreed "that Internet use

has had a positive impact on their college academic experience" (Jones and Madden, 2002).

Despite the increasingly exalted value of the Internet, students may experience significant academic problems when they surf irrelevant web sites, engage in chat room gossip, converse with Internet pen-pals, and play interactive games at the cost of productive activity. They may also have difficulty completing homework assignments, studying for exams, or getting enough sleep to be alert for class the next morning due to Internet misuse (Jagboro, 2003). Often, students may be unable to control their Internet use which eventually results in poor grades, and academic probation. There have been reported cases of some on-line users becoming addicted to the Internet with the consequent result of academic failure (Brady, 1996). The University of Botswana Library reported students not using the Internet resources for academic purposes, but instead engaged in other activities such as gaming, viewing pornographic material, etc. Parks and Robert (1996) explained that while some students flourish in an atmosphere that provides frequent opportunities for meeting new people and developing new relationships, other less socially inclined students may have difficulty in establishing real life relationships.

A study by Ainley and Searle (2005) linked Internet use to the rate of academic dismissal. Another study by Scherer (1997) found that long usage of the Internet was associated with decline in social involvement and increased depression. The study suggested that Internet use might become a substitute for other social activities. Moreover, with the Internet, it is easy as with all electronic reference sources, to cut and paste with minimum effort, making it much easier to plagiarize. Students often believe that they only need to reference direct quotations and are unaware that any information used, whether paraphrased or directly quoted, should be referenced. Nevertheless, due to the pervasiveness of the Internet especially in the western world, many educational institutions including the University of Botswana have seized on its educational potential in attempts to improve the quality of education.

The University of Botswana (UB)

The University of Botswana was established in 1982. This was after the break up of the multi-national and multi-campus University of Botswana, Lesotho, and Swaziland, that had been established in 1964 to serve the three Southern African countries of Botswana, Lesotho and Swaziland. The University main campus is situated in Gaborone, the capital of Botswana. During 2006, the University had a total enrolment of 15,425 students of which 13,104 were full-time. Approximately 51% of the students are female while 49% are male (University of Botswana, 2006). Of the total enrolment, 14,656 are pursuing undergraduate programmes (certificate up to doctoral level) while the rest are enrolled for postgraduate programmes. The University has six faculties: Business, Education, Engineering and Technology, Humanities, Science and Social Sciences. The six faculties comprise 39 departments. Additionally, the University has a school of Graduate Studies and several specialised centres and research units. The University of Botswana has staff strength of about 2,172 of which 760 are faculty (University of Botswana, 2006).

Several structural and curricular changes have taken place at the University of Botswana in the last 5 years. Notable among these are: the introduction of General Education Courses (GEC's) and implementation of WebCT eLearning platform. Moreover, the University in 2002/2003 academic semesterised its year-long academic programmes as part of key reforms aimed at enabling the University to become a leading academic centre of excellence in Africa and the World (University of Botswana, 2005:20). The GECs were introduced to provide more student determined choice and flexibility of academic programmes. The GECs generally address such cross-cutting issues as employer's expectations, competencies in communication skills, computer and information skills, etc. The rationale for GECs is succinctly outlined in the University of Botswana Calendar (University of Botswana, 2005:21) which states that every undergraduate student shall take general education courses for the purpose of broadening the knowledge, enhancing University education so that it is

broadly -based; and promotes critical thinking, intellectual growth, and general skills for lifelong learning.

The rationale for the implementation of an e-learning platform (WebCT) at UB in the words of University of Botswana E-learning Club, UBel (2002) was to fulfil the University of Botswana's responsibility to prepare students for effective participation in the wider information society; use ICT to increase the success rates of students; provide the opportunity for the University to enhance flexible learning anytime, anywhere and at student's own pace, etc. It was also expected that through e-learning, access to relevant national and international resources would be facilitated and better way of handling large classes would be achieved (UBel, 2002).

ICT infrastructure at the University of Botswana

The vision of the University of Botswana which in part aims at transforming its academic process towards a technological base has strongly influenced the strategic implementation of learning technologies on campus. Learning technologies at the University of Botswana are seen as tools that can add value to the teaching-learning process by creating a rich learning experience. The e-learning program at the University of Botswana for instance brings new levels of connectivity to the teaching learning process. Students are connected to other students, students connect with academic staff and both student and staff connect to global resources in a way that was never possible before the advent of Internet and the World Wide Web (University of Botswana, 2004).

The first attempt of the use of education technology at the University of Botswana was the introduction of overhead on a large scale in classroom teaching in 2000. And since then, the University has aggressively put in place on a programme of technological innovation (Uys, Nleya, and Molelu, 2003). For instance, WebCT e-learning platform was implemented in the University in 2002. WebCT is a commercial educational application that has been properly designed for eLearning (Seleka et al., 2006). Moreover, the University of Botswana, has an eLearning support centre with three well equipped state of the art computer labs with

wireless LAN, video conferencing systems, state of the art digital projectors, scanners, etc. The Centre's video conferencing system links the main campus in Gaborone (the capital city of Botswana) to Maun and Francistown (cities 500 and 1000 Km north of Gaborone respectively) via Integrated Service Digital Network (ISDN) and leased lines. Moreover, all the departments' or faculty's computer labs in the University of Botswana are connected to the Internet and students have free access to them.

Similarly the University of Botswana library has pioneered many IT based resources. The Library subscribes to a number of electronic databases and services such as EBSCO Host, Library and Information Science Abstract (LISA), Web of Science, etc. Moreover, the library is fully automated using Innovative's INNOPAC. The OPAC of the University of Botswana is accessible through the Web (<http://www.medupe.ub.bw>) (Lumande et al., 2006).

The e-learning Centre on one hand, and the Educational Technology Unit (EduTech) on the other, carry out the training of academic staff in the effective and appropriate use of educational technologies at the University. Every faculty staff member has a Pentium computer, an individual printer or access to a network printer, access to the Internet and e-mail with minimal power failure and network shutdowns (University of Botswana, 2004). On the other hand, the IT department at the University is in charge of providing solutions to technical problems and maintenances of ICTs used on campus.

Statement of the problem

Though studies on Internet use and academic performance are many (Comunale, Sexton and Voss, 2001; Lu, Zhu and Stoke, 2000; Gao and Lehman, 2003; Mathew and Schrum, 2003; NCES, 2005), the bulky of these studies are conducted in developed countries where there are advanced Internet infrastructure and resources for its support. The situation in Africa is different because Internet facility is still regarded as a new invention and African researchers have only recently started to study its use and impact.

For example, though the University of Botswana has been using ICT including the Internet for the last five years, studies on the relationship between academic performance and Internet use has hardly been researched. A study by Ojedokun (2001) about Internet in the University examined the adequacy of Internet access points; and use and misuse of the Internet by University of Botswana students. On the other hand, Waswa (2005) examined the use of information communication technology in research and publications within the faculty of social sciences.

Studies on relationship between Internet use and academic performance among students would be great essence to the University of Botswana. Since 2001, the University of Botswana has invested a lot of resources in computing and Internet resources and students are increasingly being encouraged to use ICTs including the Internet in their learning to enhance the quality of education. For the University to have information on whether investment in ICT is having the desired effect of improving academic performance, studies such as these are needed. Similarly, the findings from this study would provide an indication of where pedagogical changes are needed to optimise on the use of ICT resources including the Internet at the University of Botswana to enhance academic pursuit. The findings of the study would also inform decisions on where additional resources are needed for the University to consolidate any benefits that have so far been gained from use of ICT including the Internet for learning and teaching purposes. Similarly, the findings of the study would help the formulation of an Internet use policy that would firmly integrate the use of Internet in all academic programmes.

It is also possible that the findings of this study would also provide a framework to address issues of technology use and academic performance at University of Botswana in line with the vision of the University of becoming a centre of excellence in the region and beyond. Additionally, the study would provide a road map for addressing problems faced by students and the University community in general as far as Internet access is concerned. Moreover, the findings would provide an indication of whether investment in ICT is having a positive impact on the core role of the University of teaching and research. Finally, the study would assist the university to make sound

and informed ICT investments in future.

Objectives and delimitations of the study

The general objective of the study was to determine the relationship between use of the Internet and academic performance among undergraduate students at University of Botswana. Specifically, the study sought to-determine the frequency of access to the Internet by undergraduate students at the University of Botswana; determine the use to which students put the Internet at the University of Botswana; determine the relationship between Internet access and perceived academic performance among the students; investigate the differences in relationship between Internet use and academic performance among students in different disciplines; assess computer self-efficacy, prior computer experience and Internet access among students and their relationship with academic performance, find out the problems encountered by University of Botswana students when using the Internet; and suggest ways on how access to and use of the Internet can be optimised among students at University of Botswana.

The study was limited to the University of Botswana. It drew samples from among fourth year undergraduate students from 39 departments in all the six faculties of the University. Moreover, study was correlational and as such did not assume any causal relationship between use of Internet and academic performance. The study was limited

to establishing the relationship between uses of the Internet and academic performance.

Methodology

The study employed the quantitative approach. An ex-post-facto research design was used. Ex-post-facto design is a causal comparative, explanatory observational or descriptive research (Ezeani, 1998; Best and Kahn, 1998, 2006). Kerlinger (1975) describes it as a systematic empirical enquiry in which the investigator does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. In this type of design, inferences about relations among variables are made without direct intervention from concomitant variation of independent and dependent variables.

The target population of the study consisted of 4000 respondents in their fourth year out of the 10,602 full time undergraduate students at the University of Botswana distributed in 6 faculties and 39 departments. The fourth year students were chosen because they started using the Internet right from their first year. Based on this, it was assumed that it would be easier for this group to determine the contribution Internet has made to their academic performance from their third year. The distribution of the population per faculty and department from which respondents were drawn are presented in the Tables 1 and 2.

Table 1: Full-time undergraduate students per faculty at UB during 2005/06

Faculty	Student numbers
Business	1535
Education	2738
Engineering Technology	1298
Humanities	3091
Science	1494
Social Sciences	2356
Total	10602

(Source: University of Botswana Fact Book, 2005/2006)

Table 2: Full-time undergraduate students per department at UB during 2005/06

DEPARTMENT	STUDENT NOS.
Accountancy	621
Architecture	51
Arts (Humanities)	2483
Arts (Social sciences)	1358
Business Administration (Marketing)	291
Business Administration (Mgt)	337
Design (Industrial design)	55
Education (Adult)	154
Education (Design and Technology)	82
Education (Home Economics)	180
Education (Management)	97
Education (Physical Education)	328
Education (Primary)	323
Education (Science)	356
Education (Secondary)	107
Education (Special Education)	238
Engineering (Civil)	148
Engineering (Construction & Mgt)	57
Engineering (Electrical Electronic)	114
Engineering (Mechanical)	99
Finance	178
Information system (Business)	108
Information system (CIS)	106
Information system (Information Mgmt)	129
Law	303
Library Information Studies	141
Media Studies	127
Nursing Science (Generic)	253
Nursing Science(Completion)	77
Psychology	15
Science (General)	1215
Science (Computer Science)	157
Science (Environmental Health)	16
Science (Statistics)	2
Science (Urban & Regional Planning)	51
Social Work	245
Total	10602

(Source: University of Botswana Fact Book, 2005/06)

A study sample of about 13 departments and 390-434 students respondents was considered representative allowing marginal error of 5% (Israel, 2003), given that there were about 30

students on average in fourth year in every department. Sampling involved listing all the departments in alphabetical order and systematically selecting the study subject using

an interval of 3. This gave rise to 13 departments being chosen for the study. Questionnaires were administered to the respondents during a core (mandatory) course lesson where all students are expected to attend. This resulted to 434 respondents being reached comprising 167

(38.5%) males and 267 females (61.5%). However, 306 returned the questionnaire after completing it, giving a response rate of 70.5%. Table 3 shows the distribution of students in each department and the size of sample that was drawn.

Table 3: Distribution of student population per department and sample size

Department	N	Response rate	%
Marketing	25	25	100
Education Technology	*	*	*
Maths and Science Education	40	25	62.5
Primary Education	110	66	60
Electrical Engineering	29	15	52
African Languages & Literature	70	50	71
History	30	30	100
Biological Science	15	10	67
Environmental Health	10	9	90
Mathematics	20	20	100
Law	50	41	82
Psychology	15	10	67
Statistics	5	5	100
Total	434	306	

* Educational technology department did not have year fourth students.

Data were collected using a modified instrument tagged Internet Access/ Perceived Academic Performance Scale (IU-PAPS). This instrument has pre-designed questions adapted from scales such as the Internet Attitude Scale (Zhang, 2005); Internet Use Attitude Scale (Eastin and LaRose, 2000); Internet Self-Efficacy Scale (Murphy, Cover and Owens, 1989); Computer Self-efficacy Scale, and Computer user Self-efficacy Scale (Eachus and Cassidy, n.d). The IU-PAPS instrument consists of two sections (1 and 2). Section 1 requires respondents' bio-data information, while Section 2 contains the various items on access to and use of the Internet facilities.

Reliability in this study was assured by determining the overall co-efficient through a test-retest method over a two week interval. The instrument was administered to (50) respondents out of the envisaged population from a department that was not involved in the sample. Data collected was subjected to Pearson Product Moment Correlation analysis to get the

reliability co-efficient alpha of the scale. The general reliability coefficient of the scale yielded an $r = 0.82$. Moreover, the reliability coefficient of each of the various parts of the scale was: Part 1- 4, $r = 0.78$; Part 5 and 6, $r = 0.79$ and Part 7, $r = 0.76$. When r (the correlation coefficient) yields a value of + 0.5 to +1.0, the test is regarded as reliable. On the other hand, if the value of $r = 0- 0.499$, the reliability of the instrument is considered low and cannot be recommended for future use (Campbell and Fiske, 1959; Cronbach, 1951).

Data collected were analysed both quantitatively. For example, Chi-square was used to analyse the differential use of the Internet based on discipline, and determine the relationship between use of Internet and respondents academic performance. Likewise, Friedman test was used to determine the mean ranking of the purpose of using the Internet and the problems encountered by the respondents when using the Internet. Similarly, multiple correlation matrix was used to find out the

relationship among students between Internet use on one hand, and computer self-efficacy, prior computer experience, and students' academic performance on the other.

Presentation and discussion of findings

a) Frequency of access to the Internet

The results show that majority of the participants 202 (66%) accessed the Internet 1-5 hours per week. This was followed by 88 participants (28.7%) who accessed the Internet 6-10 hours per week. Moreover, 12 participants (3.9%) accessed the Internet 11 - 15 hours per week. Only two participants (0.7%) indicated that they accessed the Internet 16-20 and 21-25 hours per week respectively. The results generally indicate that majority of respondents spent limited time on the Internet per week.

This result corresponds with the finding by Jagboro (2003) that majority of users access the Internet for an hour per day i.e. between 5-7

hours per week. However, this finding seems to contradict findings by Anderson (2001) who reported an average of 9.8 hours of access to the Internet by the students of Rensselaer polytechnic New York. In another related study, Robinson (2005) reported an average of 25-30 hours per week on the Internet by Michigan African American college students. The difference in the findings regarding frequency of use of the Internet as reflected by Anderson and Robinson compared to the situation at the University of Botswana could be attributed to access time allocated students. Each student at the University of Botswana is allowed to use the Internet for just two hours per week on schedule. Becker (2000) observed, how frequently a student accesses the Internet / computers at school, and for what, depends greatly on how many computers are available with Internet connectivity and whether they are located within the classroom or elsewhere.

b) Purpose of using the Internet

Table 4: Purpose of using the Internet

Purpose of using Internet	Mean rank	Chi-square	Sign. F
To obtain course related information	7.68	978.326	.001
Communicate by e-mail	7.06		
Do school work (assignment)	6.95		
Obtain non course related information	6.39		
Chat with other persons	5.38		
Entertain myself	5.33		
Play games	4.27		
Download music	4.12		
Download games	4.10		
Create web pages	3.74		

(Chi. Square = 978.326, DF = 9; N = 306) Significant at .001

Respondents were asked to state what they used the Internet for. The result of Friedman Test (mean rank 7.68) revealed that most used the Internet for obtaining course related information. This was immediately followed by communicating by e-mail with the mean rank of 7.06. Next to this was to do school work with mean rank of 6.95 and to obtain non course related information with mean rank of 6.39. On the other hand, creating web pages had a mean rank of 3.74. This was followed by downloading games with mean rank of 4.10, downloading music came next with mean rank of 4.12. The findings generally suggest that the Internet is being used by the respondents mainly to obtain

course related information and it is least used by the respondents for creating web pages. The results also reveal that a significant difference exist between the main and the lowest purpose of using the Internet These results generally corroborate the findings by Livingstone and Bober (2005) who reported that students used the Internet mostly for the purpose of obtaining academic related information. Similarly, Kumar and Kaur reported that students used the Internet mainly for academic purposes such as obtaining course related information and communication by e-mail. On the other hand, findings from a study of Internet use in Nigeria (Jagboro, 2003) revealed that 69.86% of students

used the Internet for e-mail, 53.42% for research material and 39.71% for course material.

c) Relationship between Internet use and academic performance

Respondents were asked to indicate their perceived relationship between Internet use and perceived academic performance. Findings showed respondents strongly agreeing that it would be difficult to survive in their academic programme without access to the Internet, while 41 agreed, 37 disagreed and 24 strongly disagreed. Overall, 158 respondents strongly agreed that without the Internet, they would be average students while 62 respondents agreed that indeed with internet they too would be average students. The agree response generally outnumbers the number of those who disagreed (n= 44), and strongly disagreed, 42 (n=42). Similarly, 155 respondents strongly agreed that the use of Internet improved their GPA while 84 respondents agreed. The sum of these two on agree responses also outnumber those who disagreed (n= 40) and those who strongly disagreed, (n=27).

Furthermore, 139 respondents strongly agreed that Internet access and use enhanced their academic performance while 67 respondents agreed. These two agree responses are also more than the sum of responses for those who disagreed 61 and strongly disagreed 39. The computed Chi-square showed that the proportion of responses is significantly biased in favour of strongly agree and agree. The results suggest that a relationship generally exists between the use of the Internet by the respondents and their academic performance. Moreover, respondents were asked to self-rate their academic performance on a four points scale: Poor, Average, Good, and Excellent. These four points were collapsed into two: Poor and Average were grouped as Low; while Good and Excellent were grouped as High. The results showed that Internet access during session by the respondents in 3rd year significantly relates with respondents academic performance where (Chi. cal. 7.885; Chi. tab. 3.84; df, 1 at .05 significance level).

Similarly, respondents were asked to relate frequency of access to the Internet during the holidays to their perceived academic

performance. To establish this relationship, respondents were asked to indicate their frequency of access to the Internet during holidays in 2nd year of study. The results suggest that no relationship existed between the frequency of access to the Internet by the respondents during the holidays in their 2nd year of study and their perceived academic performance in their 3rd year of study with (Chi. Cal. = .760 > Chi. tab. 3.84, df = 1, and .05 significance level). The non significant relationship between frequency of access to the Internet and respondents perceived academic performance during holidays in 2nd and 3rd year of study may suggest that no serious academic work took place using the Internet during school holidays due to the lack of access.

Furthermore, respondents were asked to rate themselves with regard to their perceived relationship between Internet access and use on one hand and academic performance during 2nd and 3rd year of study on the other. The purpose of this question was to attempt and establish changes in the self-rating of perceived academic performance of the student in 2nd and 3rd year of study and actual academic performance for the 3rd year of study. The results showed that during 2nd and 3rd year of study, change in the self rating of perceived academic performance based on Internet use of the Internet for 0-5 hours per week decreased from the expected. Similarly, for respondents using Internet for more than 6 hours per week, 116 respondents indicated that there was a decrease in their performance, 69 respondents indicated that their performance remained unchanged, and 13 respondents indicated that there was an increase in their performance. Despite the fact that many respondents than expected indicated that there was a decrease in their perceived academic performance in their 3rd year of study even though they had used the Internet, the result still showed that there was a significant relationship between use of Internet and respondents' perceived academic performance (Chi. cal. = 17.68, Chi.tab.5.99, at 2 degree of freedom). Overall, the results suggested that the use of Internet correlated with students' academic performance. Similarly, the result of the Interview conducted with heads of departments about relationship between

Internet access and academic performance of students showed that Internet access enhanced academic performance

The relationship between frequency of Internet access during school session and perceived academic performance in third year of study on one hand; and the relationship between percentage changes in the self ratings on participant's perceived academic performance in their 2nd and 3rd year of study on the other revealed that significant relationship exists between use of the Internet and perceived academic performance. However, no significant relationship was shown in the use of Internet during holiday in second year and self-rating of perceived academic performance of the participant during session in third year of study. The decrease in the academic performance in the 3rd year of study may be an aberration but could also be attributed to limited access to Internet during the holidays when students are not in session

The various findings on the existence of relationship between Internet access and perceived academic performance among the University of Botswana undergraduate students in general are in conformance with empirical findings, postulates and assertions from related studies. For instance, Comunale, Sexton and Voss (2002) found evidence which suggested that higher course grades were related to more frequent website use. Similarly, National Science Foundation (1997) reported that time spent on the Internet significantly relates to academic performance. The findings of this study at the University of Botswana are also in agreement with those reported by Gao and Lehman (2003) who found that web-based learning increased student's performance considerably. Additionally, a study by NCES (2005) revealed that most students (88%) report that Internet help them to do better in school. Similarly, the findings by Mathew and Schrum (2003) show that positive relationship exists between ratings of academic performance with the amount of time spent per week on the Internet. Moreover, Laird and Kuh (2004) showed that a strong positive relationship exists between using information technology and academic performance

d) Differences in the use of Internet along disciplinary lines

Respondents were asked to indicate by ticking yes or no the reasons why they used the Internet. The purpose of the question was to establish the differences existing in Internet access and use among respondents based on their disciplines. The results suggest in general that Business, Engineering technology, and science had their expected count less than 5 (25%) when the minimum expected count was 1.62. The single case Chi-square was found to be 16.9 which was significant at .05. This outcome suggests that a significant difference exists in the use of Internet by the respondents especially with respect to obtaining course related information based on discipline. The findings moreover suggest that respondents in the disciplines of Education, Business and Humanities accessed the Internet largely to obtain course related information more than respondents from other disciplines.

On the issue of using Internet to obtain non course related information, the findings showed that no cells i.e. (.0%) has expected count less than 5 when the minimum expected count is 5.49. This result suggests that no significant difference exists in the use of Internet for obtaining non course related information by the respondents based on disciplines. Similarly, looking at the use of Internet to communicate by e-mail, the result suggest that one cell i.e. Engineering Technology has an expected count less than 5 (8.3%) with the minimum of 3.53, and Chi square of 7.5. This result suggests that no difference exists in the use of the Internet by the respondents for communication by e-mail in Engineering technology and other disciplines. On the use of Internet to chat with other persons, the results suggest that no cells have an expected count less than 5. The minimum expected value count was recorded by Engineering Technology, while the Chi-square was valued at 18.4. These results suggest that there is a difference in the use of Internet by engineering technology students to chat with other persons compared to other disciplines. In particular, the findings suggested that Humanities, Education and Social Sciences use the Internet for chatting more than other disciplines.

On using the Internet to download games, the results suggest that 2 cells (16.7%) had expected count less than 5 with the minimum expected count of 2.65, while chi-square was 8.3. This finding generally suggests that there is no significant difference in the use of Internet to download games based on respondent's discipline. On using the Internet to do (assignment), 1 cell (8.3%) had expected count less than 5 when minimum expected count was 3.82 and the chi-square was valued at 15.7 which is significant at .05 level. This result suggests that a significant difference in the use of Internet to do school work (assignment) exists from disciplinary point of view. Furthermore, the result suggest that a significant difference exists in the use of the Internet to play games, and entertain self; while no difference exists in the use of Internet to download music and create web pages from the disciplinary point of view.

The findings on the whole reveal that differences exist in the uses of Internet to obtain course related information, chat with other persons, do school assignment, play games and entertain self from discipline to discipline. These results correspond with the findings of Livingstone and Bober (2005), Kumar and Kaur (2005) who found that majority of the students searched the Internet for the purpose of obtaining academic/ course related information. The variation in the student's use of the Internet based on discipline as reported earlier could be attributed to the fact that information in some discipline was more available on the Internet than in other disciplines.

e) Relationship between computer self-efficacy, prior computer experience, Internet access and academic performance

Respondents were asked to indicate the extent of their computer self-efficacy on a four point scale. They were also required to state their frequency of access to the Internet per week. The purpose of these questions was to find whether the three variables relate to respondents perceived academic performance. The inter-correlation coefficients between the pair of the independent variables (Computer Self Efficacy, CSE and Prior Computer Experience, PCE) were not so high and so the relationship

was found to be weak. The highest correlation coefficient was found between PCE and Internet access ($r = .45$), while the least correlation coefficient was recorded between CSE and Internet access ($r = .17$). These results suggest that the two independent variables (CSE and PCE) significantly relate to and influence Internet access and academic performance among the University of Botswana students. Additionally, the entire three variables correlate significantly with academic performance when it was taken as a dependent variable (Internet access, $r = .366$; Computer self-efficacy $r = .326$; and Prior computer experience $r = .336$).

On the correlation between computer self-efficacy and prior experience, the result indicates that the two independent variables significantly relate to and influence Internet access of the participants. Additionally, the entire three variables correlate significantly with academic performance when it was taken as a dependent variable (Internet access, $r = .366$; Computer self-efficacy $r = .326$; and Prior computer experience $r = .336$). The result seems to be in consonant with the postulate by (Yashau, 2004) that prior knowledge or experience provides a learner with a large amount of relevant information in specific domain as well as the strategies of organizing the knowledge. Empirical studies (Yates and Chandler, 1994; Geer, White and Barr, 1998) show that a student who enters a program with a wide range of prior knowledge and experience, learn quickly, and develop confidence in the new skills they are learning. Yushau (2004) observes that the major difference between higher and the lower achievers is that the former are capable of using their previous knowledge to learn new information while the later lack that capacity. Loyd and Gressard (in Yashau, 2004) point out that students with high computer experience are significantly confident about related task than those with less prior computer experience further lend credence to this present result.

On the other hand, self-efficacy has been proved to be essential to overcome fear that many novice users experience. Campaeu and Higgins (1995) on one hand and Stapple, Hulland and Higgins (1998) on the other noted that those with high levels of computer self-efficacy in remote computing situations were

more productive and satisfied, and better able to cope when working remotely.

f) Problems encountered when using the Internet

Respondents were asked to state problems they faced in Internet access and use. The respondents were provided with a number of options to choose from. The purpose of this question was to find out which of the problems were commonly encountered by the students when accessing the Internet.

The results based on Friedman Test generally showed limited access in terms of inability to get computer to use during school session (Mean = 4.85) as the most significant problem followed by slow connections (Mean = 4.83); inability to get computer to use during holidays (Mean = 4.69), too much information received (Mean = 4.40); time consuming due to slow connections (Mean = 4.39); lack of knowledge to use the Internet (Mean = 2.43); and lack of knowledge to use the computer (Mean = 2.39). The Chi-value of (597.102) represented the difference between the problems ranked on top and those at the bottom. This is significant at .000 and 6 degree of freedom. These results suggest that respondents are being confronted with a lot of problems when accessing the Internet at University of Botswana and these problems are significant and need to be dealt with.

On the issue of problems encountered by the participants when accessing the Internet, the finding show limited access in terms of inability to get computer to use during school session and slow connections as the most significant problems. These problems are not new. Even in the developed world where the use of the Internet began and has come of age, such problems have been experienced. For instance, Mashra, Yadav and Bisht (2005) found in a survey conducted in the United States that majority of respondents 83.7% male and 61.3% female faced the problem of slow Internet access. The inadequacy and insufficiency of the access point as revealed on this study may be connected with the poor financial status and funding at the University of Botswana

f) Measures needed to enhance and optimize use of the Internet

Respondents were asked to suggest ways by which problems of Internet access at the University of Botswana could be addressed. The findings generally revealed the provision of more Internet access points on the campus as the most common suggestion with 89 respondents (29.1%). This was followed by other suggestions such as: giving allowances to students to buy personal computers or laptops with 45 respondents, (14.7%), and allowing cyber café service providers to operate on campus, 38 respondents (12.4%). From these findings, it can be seen that the provision of more Internet access points on the campus was the common suggestion. This was followed by giving allowances to students to buy personal computers or laptops instead of depending on the school. Another common suggestion was that cybercafé operators should be allowed set up service points on University of Botswana campus. The solution that more access points should be provided should be considered a vital one.

Conclusions

The purpose of this study was to investigate the relationship between Internet use and perceived academic performance among undergraduate students at the University of Botswana. The findings generally showed that significant relationship exists between use of Internet and academic performance. The decrease and unchanged academic performance for some respondents could be attributed to factors such as limited access to the Internet and the lack of adequate digital literacy.

In the context of Botswana, a number of recommendations are proffered. The limited access to Internet would be addressed in part by encouraging students to seek alternative means of gaining access to the Internet especially cybercafé and public libraries that have Internet access. The University should find a more practical way of enhancing equitable access to Internet resources rather than limiting access. Such practical approach could include, opening computer labs for 24 hours 7 days a week. Similarly, because the major use to which the University of Botswana students put the Internet is to obtain course related information, students should be well equipped with digital literacy

skills for them to make effective use of the Internet resources available of campus. Moreover, the University of Botswana should consider putting in place a policy that integrates use of the Internet in the delivery of academic programmes. On the other hand, given the commitment of the University of Botswana's to use ICTs in learning and teaching, it is important for the University to consider increasing Internet access points on campus to enhance access. Moreover, attempts should be made to upgrade the infrastructure to improve bandwidth and enhance speed of Internet access.

Additionally, the differences that were identified with regard to Internet access among students from different disciplinary backgrounds with the university requires further investigation. Similarly, given that this study only tried to establish the relationship between use of the Internet and perceived academic performance, future research at the University of Botswana should delve into the nature of the relationship in terms of whether it's negative, positive and overall impact of Internet connectivity at University of Botswana. On the other hand, given that computer self-efficacy and prior computer experience were found to influence use of Internet, government should consider providing subsidy or credit to students for computer purchases in the same way they do with educational loans. Similarly, government could consider improving access to the Internet in society by equipping public libraries and schools with Internet access facilities.

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