

PREDICTORS OF ACADEMIC PERFORMANCE: SELF-EFFICACY AND USE OF ELECTRONIC INFORMATION

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Abstract

In the digital era any student in the institution of higher learning who intends to excel in academics should have the ability to effectively utilize electronic information resources and services. This study examined self-efficacy and use of electronic information as predictors of academic performance. Seven hundred students (undergraduate and postgraduate) were randomly drawn from 7 departments in faculty of education, university of Ibadan, Nigeria. Three research questions guided the study. Morgan-Jinks (1999) academic self-efficacy scale and use of electronic information scale (UEIS) with $r=0.75$ were used. The result indicates that self-efficacy and use of electronic information jointly predict academic performance, and that correlation exists among self-efficacy, use of electronic information and academic performance. Finally, the result reveals that Internet information resources are frequently used by students. Based on the research findings the study makes some recommendations.

Introduction

Improved student achievement ultimately depends heavily on the interplay of full commitment and personality constructs. Learning efforts as well, do not always result in successful learning outcomes because students inevitably face obstacles, interferences and failures and the most frequent outward sign of their failure is low grade. Psychologists and educationists argue that an individual's self-efficacy, or perception of capability or ability, is intimately related to learning behavior patterns. Many students have difficulty in school not as a result of intelligence or physical impairment, but because they have perceived themselves as unable to do academic work (Esrtrom, 1996). Success in school work or life appears to depend on how much a person feels about the qualities and abilities possessed or on those qualities themselves. Estrom explained that when a

student says "I will never understand this material" he is saying more about himself than about the subject matter. It is likely that such students will not cope essentially because they judge themselves as not competent and capable of being successful. This is why Bandura in Pajares (2002) argues that many students have difficulty in schools not because they are incapable of performing successfully but because they are incapable of believing that they can perform successfully, they have learned to see themselves as incapable of handling academic work or to see the work as irrelevant to their perceptual world. To him, students with strong sense of personal competence, approach difficult tasks as challenges to be mastered rather than as threats to be avoided.

Related to the issue of self efficacy, is the current debate about influence of technology on students' academic achievement. A vast and growing amount of information available through electronic information resources, and its accessibility to the students should be seen as an opportunity to enhance their academic performance. This is because it provides an atmosphere that encourages sharing of knowledge in the creative process and collaborative efforts among educationists, students and researchers. The questions that arise therefore are: do the students make use of this opportunity? Does this opportunity yield them any positive result? This study examines self-efficacy and the use of electronic information as predictors of academic performance.

Literature Review

Self-efficacy perceptions are judgments regarding one's capability to successfully perform specific tasks and behaviors (Saks, 1995). It is the belief in ones capability to organize and execute the course of action required to manage prospective situations (Bandura, 1999). In essence, self-efficacy is the confidence that one has in one's ability to do the things that one tries to do. Bandura (1986) defined self-efficacy as people's judgment of their capabilities to organize and execute course of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses (p.391). Thus perceived self-efficacy is a significant determinant of performance that operates partially independent of underlying skills (Bandura, 1986). It involves a generative capability in which one must organize cognitive, social and behavioral sub-skills into integrated courses of action (Saks, 1995).

Most investigations on self-efficacy in academic settings have sought to determine the predictive value of self-efficacy belief on varied performance. Academic achievement depends heavily on the students' personal conviction of being in charge of their own fate. The high achievers did not ascribe their fate to luck or to the vagaries of chances but rather to their own personal decision and efforts (Coleman in Richardson; Norman and Sharon 1998). In the Same vein, students who rarely experience success in the classroom and perceive themselves as academic failures often develop a syndrome that includes a variety of self –defeating motives. For example, such students are far more apt to develop an external locus of control, they are low in self regulated learning strategies and they have low levels of self-efficacy and as well no motivation (Richardon; 1998). Frank and John in Tella and Tella (2003) observe that prior determinants such as ability and previous performance attainments helps to create self-efficacy perceptions and are also strong predictors of subsequent performance. Waldman (2003) asserts that academic self-efficacy beliefs vary according to subject matter, in that students may have high self-efficacy in one subject but not in another. Since “people are generally more interested in performing activities in which they have high self-efficacy”(Ren, 2003:323), we can now infer from here that students with high self-efficacy will be more likely to take advantage of what is around them (e.g., electronic information). That is, if they are familiar and feel comfortable with them for example (Internet, electronic journals, CD-ROM database etc.), they will use them, and if they feel that learning through these electronic information resources will enhance their academic performance, they will learn about them.

Few studies have been conducted on self-efficacy and use of electronic information and findings seem to suggest that the two variables might be related to academic performance. Lent, Lopez and Beischke (1993) showed how efficacy can be tailored to varying levels of academic outcomes and still remain highly predictive. In some studies, researchers have reported that girls perform as capable as boys in varied academic tasks but nonetheless report lower self-efficacy, particularly at higher academic levels (Pajares and Johnson, 1996; Pajares and Miller, 1994). Studies (Lent, Lopes and Miller, 1993) have further confirmed that the self-efficacy of students is more predictive of their interest in major school subjects than their prior achievement or outcome expectations and that male students report higher self-efficacy than female students. Tella and

Tella (2003) also report that self-efficacy has a significant relationship to academic achievement and that the variable is a better predictor of academic achievement. In a study of library instruction and self-efficacy (Ren, 2000) also showed a positive correlation between students' self-efficacy and the frequency of use of library electronic resources.

Students' use of information system can be in the form of communicating or posting of information or material by way of electronic mail bulleting boards, world wide Web (Internet), or other such electronic tools (Mischnick, 1998). Electronic information has a lot of functions and benefits that are prominent, which can be of immense use to students in various schools and educational sectors particularly research institutions. Once the user is connected to the Internet can link up with any part of the world for the purpose for which the user intends (Osunrinde, Adekiya and Adeyemo, 2002). Electronic information serve as a motivating factor to students as it provides them with the opportunity to transmit, acquire or download process and disseminate information on subject of interest. Electronic information sources offer today's students' opportunities different from their predecessors (Ray and Day, 1998). Brophy (1993) further observes that electronic information is "information needed which can be delivered from the most appropriate source to the user; the user can re-specify his or her needs dynamically; the information is obtained when it is wanted, so becomes 'just in time' rather than 'just in case'; the user selects only the information needed to answer the specific question and finally, the information is only stored should the user wish."

Other advantages according to (Ray and Day, 1998:5) include the fact that "electronic information sources are often faster than consulting print indexes, especially when searching retrospectively and allows the use of keyword combinations. They open up the possibility of searching multiple files at one time, a feat accomplished more easily than when using printed equivalents. Electronic resources can be printed and searches saved to be repeated at a later date; they are updated more often than printed tools." Relating to these, Internet is used as medium of expression to educate the learners and provide information needs at their door steps to ensure hitch free and cross reference data to the appropriate location. However, it could be said that improved data transmission facilities will go a long way to reduce the incessant hardship faced

by students in the acquisition of and data generation which serve as basis for research and academic performance improvement. Among the electronic information system students get, most of their information include Internet, E-mail, electronic journal, bulletin boards, telephone, telex, CD-ROM database, electronic journals, electronic books etc.

Some studies on use of electronic information and academic performance (e.g. Joan and Craig, 1998) revealed that the academic community has accepted that electronic information sources had an impact on their work. Although services currently available to academic staff and students are not being used to their full potential and some are hardly used. There are various reasons for the use and non use of the Internet including how the academics perceived the Internet and what it was capable (or not capable) of doing which influenced the extent it was referred to.

Swan and Brown (1996) reported that in the academic situation, a huge proportion of respondents have access both to Internet facilities and to online services provided via library, yet usage figures for these media are quite low. Corporate respondents indicated that they are not confident of their abilities to use these media effectively and anecdotal evidence suggests that academic end users feel similarly. Academic end users rated journals as the most important sources of information with 86% undertaking a systematic search of these journals in print form in their institutional library. The academic respondents were overwhelmingly in favor of greater access to electronic information.

Elliot (1996) supported the idea that the use of computers in the education of young children promotes social interaction and academic achievement. He suggested that there should be provision for introduction to computers in early childhood settings to enrich learning opportunities and provide guidance to teachers to find developmentally appropriate software and hardware. In the same analysis "minimal communication between school and home was found by Burden (1995) to contribute to low performance by students. He describes the experience of establishing a computer based telephone message system in the high school, and involving parents, teachers, and students in its use. The results of his survey research further state that at the end of nine weeks of system use, there was a positive increase in school/home communication and in

provision of classroom information by teachers, although only one of six expected outcomes was achieved.

Bishop (1991) argues that the potential of the National Research education network has dramatically changed the nature of education, and scholarship is becoming more apparent particularly when the library and education communities are continuing to expand their use of electronic networks. He suggested that students may use electronic network to learn by engaging in electronic conversations with distant peers who are native speakers, and libraries may create and "publish" electronic information resources over the network to an audience far broader than their tradition patron group. Bandura also looked at how self-efficacy relates to computer use, linking computer use with educational achievement, especially since computers provide a ready means for self-directed learning. Bandura 1997:434) shows how disparities in computer skills can create disparities in educational development". He stressed further that "belief in one's efficacy to master computers predicts enrollment in computer courses independently of beliefs about the instrumental benefits of knowing how to use them" (Bandura, 1997:435).

Waldman (2003), when drawing inference from Bandura's position asserts that "students with high self-efficacy regarding computers would also be more likely to explore new technologies, software or databases. Additionally, they would be more likely, for example, to explore a library's website and find that the library has specialized resources, and they might even try some searches on those resources without, or with less prompting from professors and/or librarians and without necessarily taking library workshops" (p.12). Studies have also been conducted on access to electronic information in the context of African universities. For instance Oduwole and Akpati (2003) examined the accessibility and retrieval of electronic information in the Nigerian University of Agriculture Library, Abeokuta. The majority of users were satisfied with the information obtained and reported that they found these automated services to a greater or lesser extent easy to use. The major constraints to information accessibility and retrieval of automated library services were infrastructural: the limited number of terminals available for use and power supply outages. Wats and Ibegbulam (2005) present results from a preliminary investigation into the situation regarding access to electronic healthcare information in developing countries,

focusing on the circumstances in the Medical Library, College of Medicine at the University of Nigeria. Information gathered from a series of interviews with the librarian at the Medical Library identify a number of issues, including the lack of an adequate ICT infrastructure and affordable online access, and a need for library staff and library users to gain ICT skills and information seeking skills.

Chisenga (2004) carried out a survey of the use of ICTs in ten African Public Library Services and found that, although most libraries had Internet connectivity, almost none were offering Web-based information services to their users. He identified four principle barriers to the effective provision of ICTs in the surveyed libraries: lack of adequate or reliable funding; lack of strategic planning; none-use of Internet to provide information services to users; and lack of consistent training for library users in new ICT services. Ondari-Okemwa (2004) carried out a survey of 46 sub-Saharan countries to discover the impediments to providing access to “global knowledge” in sub-Saharan Africa. Respondents suggested that unreliable electricity supply and high cost of ICTs were significant barriers to accessing online information. Similarly, in a study of access to electronic information resources in Nigerian libraries, Ashcroft and Watts (2005) found that unreliable electricity supplies and prohibitively high costs of Internet Service Providers (ISPs), hardware and software were barriers to ICT provision. In a discussion about ICTs in African universities, Karbo (2002) also identifies the problem of the cost of providing ICTs as well as a suitable infrastructure to house them.

This paper focuses on self-efficacy and use of electronic information as predictors of academic performance.

Methodology

The study sample comprised of 700 undergraduate and graduate students from the Faculty of Education, University of Ibadan. These were randomly selected from seven departments that make up the faculty. One hundred students were selected from each department. The mean age of respondents in the sample was 35 years and the range was between 25 and 45 years.

The Morgan-Jinks student self-efficacy scale developed by Morgan and Jinks (1999) was used. The instrument is a thirty item scale and

had an overall reliability coefficient of $r=0.8$. The sub-scale Alpha was 0.78 for talents, 0.70 for context and 0.66 for efforts. The instrument has a response format ranging from Really Agree (1) to Really Disagree (4).

The use of electronic information scale adapted from various standardized scale developed to measure impact of information technologies on academic achievement were adapted and revalidated. The reliability co-efficient of the scale yielded $r=0.82$ using a test retest reliability method of two weeks interval. Responses to the instrument ranges from strongly agree to strongly disagree.

Data on academic performance of the participants were collected through an aptitude test developed in the field of general knowledge which includes English Language and Mathematics and General Education. The test contains 40 items with a reliability of $r=0.81$ through a split half reliability method. It is a multiple choice scale which was scored over 100%.

The three instruments were administered to all 700 participants in the study. Since all the respondents were drawn from the faculty of education, University of Ibadan, the administration took place in a hall under a normal examination condition. The response rate was 100%.

The data gathered to answer the three research questions developed on this study were analyzed using multiple regression analysis, Pearson production moment correlation matrix, and simple percentage statistical tools.

Findings

Research Question 1: What is the joint contribution of self-efficacy and use of electronic information to academic performance of the participants? The results of the analysis are presented in Table 1.

Table 1: Regression Analysis on Performance Data.

Multiple R	= .30638
R - Square	= .09387
Adjusted R - Square	= 05531
Standard Error	= 8.32556

Analysis of Variance

Source	DF	Sum of squares	Mean Square
Regression	2	337.47657	112,49219
Residual	697	3257.80343	4.674036485
F=24.77		Sign F= .0986	

The results in Table 1 show that the two independent variables [self-efficacy and use of electronic information] made a joint contribution of 9% to academic performance of the respondents. The result of the analysis of variance [ANOVA] that was done on multiple regression data produced an F-ratio 24.77 of which was significant at 0.05 Alpha level. The result of the first research question on this study reveals that both self-efficacy and use of electronic information jointly predicted academic performance of the students. This is corroborated by studies (Tella and Tella, 2003; Pajares and Johnson, 1996) that self-efficacy is a better predictor of academic performance. On the use of electronic information, Eliot (1996) supported the use of computers in the education of children by stating that it promotes social interaction and academic achievement. The finding also supports study by Joan and Craig (1998) which revealed that electronic information sources had a positive impact on academic performance.

Research Question 2: Is there any correlation among self-efficacy, use of electronic information and academic performance? To answer this question, participant's score on the self-efficacy test, use of electronic information and aptitude test were correlated using Pearson product moment multiple correlation matrix. The result is presented in table 2.

Table 2: Correlation Matrix among the Variables

Variables	Academic performance	Electronic. Inf.	Self-Efficacy
Academic. Performance	1.0000		
Electronic. Information	.2779*	1.0000	
Self-Efficacy	.1559*	.0991	1.0000

Table 2 contains descriptive statistics and inter-correlations among the study variables. As indicated in the table, academic performance correlated with: (1) Use of electronic Information ($r = .2779$; $P < 0.05$); Self-efficacy ($r = .1559$; $P < 0.05$). This indicates that both the variables correlate with academic performance only that electronic information has greater correlation value than self-efficacy. The results of the second research question reveal that correlation exists among the independent variables (self-efficacy and use of electronic information) and the dependent variable (academic performance). The reason for this correlation may be due to the fact that academic performance most of the time depend on students' personality variables. No doubt self-efficacy is a personality variable, hence the correlation. Additionally, gathering of qualitative relevant information through e-mail, electronic journals, electronic books, CD-ROM database and host of other as well as their effective use can also bring about good academic performance. It can also be stressed that students find it more interesting gathering information through electronic sources; hence their influence on academic performance.

Research Question 3: Which electronic information sources do students use most often? To answer this question percentage and frequency count of the participant's response to each of the electronic information sources indicated were conducted.

Table 3: Percentage of Common Use electronic information Sources

Sources	No of Respondents	Rank	Percentage
Internet	248	1	35.42
CD-ROM Database	143	2	20.43
Elect. Journal	131	3	18.71
E - Mail	128	4	18.29
Electronic Books	26	5	3.71
Bulletin Board	24	6	3.43

The data in Table 3 above reveal that electronic information source that students use most often to search for information is Internet with 248 respondents (35.42%). This is followed by CD-ROM Database with 143 respondents (20.43%). Electronic journal is next with 131 respondents (18.71%), followed by e-mail with 128 respondents (18.29%); while electronic books have 26 respondents (3.71%) and bulletin board 24 respondents, (3.43%) followed

respectively. These results indicate that the internet is now a vital source of information for students. They also show that students are making use of the electronic information resources to improve their performances. This study has shown the positive effects of Internet on students' academic performance. Therefore there is a need to make sure that efforts are being made for the provision of Internet connectivity in all academic institutions to keep abreast of new developments in the various academic disciplines.

Conclusion

This study has revealed that the combined effects of self-efficacy and the use of electronic information resources predict and influence academic performance. It found that correlation exists among all the variables and the internet is the electronic information resource that students frequently use.

Recommendations

Based on the research findings the following recommendations are made. One, academic staff and students should be made aware of the information available on the web and its benefits and relevance. Two, training and guidance in the use of electronic information resources (including the Internet) should be offered to both academic staff and students. It would be beneficial if new skills were integrated into the curriculum so that students can be taught how to conduct effective searches. This will enable them to be able to discriminate between relevant and irrelevant resources. Third, electronic information resources should be made available for use all the time.

Fourth, information literacy as a course should be made compulsory for all students irrespective of their discipline. This will go a long way to increase the knowledge and skill level of the learners regarding the use of electronic information. Therefore, librarians and information professionals should provide the necessary training in the use of e-resources. Finally, students should be encouraged to have a positive perception about themselves and their ability to perform academic tasks. This will enable them to tackle any academic task and consequently achieve success.

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