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## TECHNOLOGY USE AND SELF-EFFICACY AS PREDICTORS OF ACADEMIC STANDING AMONG POLYTECHNIC STUDENTS IN OGUN STATE

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### ABSTRACT

This study investigated the usage of technology and self-efficacy as predictors of academic standing among polytechnic students in Ogun State. The study adopted a descriptive survey research design of an ex-post facto type. Three research hypotheses were formulated and tested at 0.05 level of significance. Data were collected using two standardized instruments for usage of technology and self-efficacy, while a self-developed questionnaire was used to assess academic standing among the students. Research questionnaires were administered to one thousand five hundred (1500) students that were randomly selected from two polytechnics (one federal and one state) in Ogun State, Nigeria. Data were analyzed using Pearson Product Moment Correlation Coefficient, t-test, and multiple regression statistical methods. The findings of this study reveal a significant relationship among the variables of the study. The study also indicates a significant prediction of technology use and self-efficacy on students' academic standing ( $R = .583$ ;  $R^2 = .340$ ;  $F_{(2,1483)} = 23.709$ ;  $P < .05$ ). Also, the study reveals no significant gender difference in students' academic standing ( $t = 1.217$ ,  $P < 0.05$ ), while significant difference was observed based on discipline ( $t = 3.428$ ,  $P < 0.05$ ). Based on the outcome of this study, recommendations as well as suggestion for further studies were raised.

**Key Words:** Academic standing, self-efficacy, technology use, polytechnics' students, gender.

### Introduction

Students' academic standing is determined by the quality of their academic performance and progress toward their academic goals. Good academic standing indicates that a student is eligible to continue his or her academic career when he/she is not on academic probation, or disciplinary probation or suspension/expulsion from the college. However, technology changes the way of

learning in the classroom. Students are no longer bound, physically, by the bricks and mortar that surround them. Instead, they have at their fingertips the opportunity to explore the world and take in vast amounts of information along the way. We are only just beginning to realize the potential of technology in helping to improve student learning and increase academic performance (Aramugam, 2011).

Studies within the educational institutions suggest that students have been using computers for a variety of purposes, on average, for over seven years (Quan-Haase, 2007), almost all students report owning computers (Hargittai, 2007; Malaney, 2004–2005), and the majority of students at universities have been online for more than six years (Quan-Haase, 2007; Hargittai, 2007). Malaney (2004–2005) found that Internet use had increased significantly among students in recent years. Specifically, Gordon, Juang, & Syed (2007) report that the top five uses of the Internet in their convenience sample of undergraduate psychology students were e-mailing friends, getting help with school work, talking with friends, e-mailing family, and IM. In a Canadian study, Quan-Haase (2007) found that 78 percent of the students reported owning a cell phone, but only 36 percent used it daily. Hargittai (2007), in a study of all incoming students at the University of Illinois-Chicago, found that almost 97 percent had a cell phone. In Nigeria, Adenuga & Ayodele (2012) found out that 3488 (87.7%) of their participants made use of mobile phones; 357 (9.0%) made use of laptop; 116 (2.9%) made use of desktop computers and 15 (0.4%) respondents made use of other means of accessing the web-page, not for academic attainment but for social networking.

Adenuga & Ayodele (2012), Junco & Mastrodicasa, (2007); Lenhart, Madden, & Hitlin, (2005) noted that students and young adults use a variety of technologies at very high levels, much higher than other age groups. Unfortunately, little is known about the impacts of the use of these technologies on students' academic standing especially within the Nigeria context. Self-efficacy is seen as an individual's confidence in their ability to organize and execute an action to solve a problem or accomplish a task (Bandura, 1997). Several studies (Adenuga & Ayodele, 2009; Bandura, 1997; Mabekoje, 2010; Salami, 2004) have linked self-efficacy to academic success. Self-efficacy can make a difference to people's ways of thinking feeling and action. With respect to feelings, a low sense of self-efficacy is associated with depression, anxiety and helplessness. People with low self-efficacy also harbor pessimistic thoughts about their performance and personal development (Mabekoje, 2010; Adenuga & Ayodele, 2009). In constant, a strong sense of belief in one-self facilitates cognitive and execute processes in multiple contexts, influencing, for example, decision making and academic achievement (Bandura, 1995; Shcwarzer, 1999).

Self-efficacy has been found to be related to academic achievement, behaviours and attitudes (Faulkner & Reeves, 2009; Hagger, Chatzisarantis & Biddle, 2001; Yalcinalp, 2005; Schwarzer & Fuchs, 2009; Salami, 2004; Salami & Ogundokun, 2009). Research has shown that low research self-efficacy can interfere with students' academic success (Adenuga & Ayodele, 2009; Love, Bahner, Jones, & Nilson, 2007). Research has also shown that high self-efficacy is an important factor related to students successfully implementations of academic goals (Adenuga & Ayodele, 2009; Forester, Kahn, & Hesson-McInnis, 2004).

### Purpose of the Study

The purpose of this study was to investigate the influence of technology use and self-efficacy on students' academic standing among polytechnic students in Ogun State. This will help to give direction to programmes aimed at increasing students' academic standing. There are inconsistencies in previous research on students' academic standing. We have not been able to find studies in which all these predictors have been examined together to influence students' academic standing. Therefore, this study is crucial to the understanding of the predictors of students' academic standing in Ogun State.

### Hypotheses

In order to achieve the purpose of this study, the following hypotheses were tested at the .05 level of significance.

1. There is no significant relationship among the variables of the study (technology use, self-efficacy and students' academic standing).
2. There is no significant prediction of technology use and self-efficacy on students' academic standing.
3. There is no significant difference in students' academic standing based on gender and discipline.

### Research Methodology

**Research Design:** This study adopted an ex-post-facto survey research design where questionnaire were used to collect data from the respondents on the studied variables.

**Participants:** A total of one thousand five hundred (1500) students from Federal Polytechnics Ilaro, and Moshood Abiola Polytechnics who had spent at least one academic year with the institution were purposively selected for this study. The stratified sampling technique was used to select respondents to reflect strata of the disciplines (course of study), which include the science based and non-science based courses. Also, a simple random sampling technique was used to select the participants based on gender and discipline. The age range of the respondents is between 16- 29 years with mean age of 18.23 and standard deviation of 8.15.

### Measures:

**Biographical Information Sheet:** The biographical data information sheet was used to collect information on the participants' gender (male or female), age in years, and field of study.

**General Perceived Self-efficacy Scale (G.P.S.S.):** Self-efficacy was measured using the General Perceived Self-efficacy scale (G.P.S.S.) developed by Schwarzer and Jerusalem (1995) which assesses a self-efficacy based on general personality disposition. Participants responded by indicating their extent of agreement with each of the 10 statements using a four-point scale of 1 (Not at all true), 2 (Barely true), 3 (Moderately true) and 4 (Exactly true). The GPSS has demonstrated high internal consistencies with Cronbach  $\alpha$  ranging from .75 and .90 (Schwarzer & Jerusalem, 1995).

**Students Technology Usage Scale (STUS):** A modification of Ersoy and Aktay, (2007)'s Internet Resources Scale was used to assess participant's tendency to use technology to enhance academic success. The instrument has 27 items that adopt a four-point Likert-type format

ranging from 1 (strongly disagree) to 4 (strongly agree). The internal consistency reliability of STUS in this study yielded a Cronbach's alpha  $\alpha = .83$ . The scale was found to be suitable for Nigerian samples.

**Academic Standing Questionnaire (ASQ)** was a self-developed questionnaire made up of 15 items. It measures the extent at which a student is eligible to continue in attendance and not on academic probation or disciplinary probation/suspension/expulsion from the polytechnic. The scale adopts a four-point Likert-type format ranging from 1 (strongly disagree) to 4 (strongly agree). The internal consistency of the scale by Cronbach's alpha  $\alpha = .79$  for the present sample.

**Procedure:** A set of questionnaires for assessing biographical data information, technology use, self-efficacy and students' academic standing questionnaire were administered on the sample through the assistance of two (2) research assistants.

**Data Analysis:** Product moment correlation, t-test and multiple regression analyses were used to analyses the data collected.

## Research Results

**Table 1: Descriptive Statistics of Participants Based on the Variables of the Study**

S/N	Variable	Category	N=(1483)	Frequency	%
1	Sex	a.	Male	647	43.6
		b.	Female	836	56.4
2	Age	a.	Under 18years	587	39.6
		b.	18years above	896	60.4
3	Field of Study	a.	Science-related courses	748	50.4
		b.	Non-Science related	735	49.6
4	Ever Usage of Technology	a.	Yes	1500	100.0
		b.	No	Nil	Nil
5	Frequency of Usage	a.	Hardly Ever	Nil	Nil
		b.	Daily	1257	84.8
		c.	Twice or thrice weekly	226	15.2
6	Accessibility Means	a.	Mobile Phones	984	66.4
		b.	Laptop	327	22.0
		c.	Other means	172	11.6
7	Available Resources Used	a.	Academic Journals Database	567	38.2
		b.	Electronic Libraries	488	32.9
		c.	Blogs/Forums	107	7.2
		d.	Search Engines	913	61.6
		e.	Social Network Engines	1321	89.1

The result of the analysis of the demographic variables of the study revealed that male respondents were 647 representing 43.6% while female respondents were 836 (56.4%). Respondents less than 18years of age were 587 (39.6%) while those above the ages of 18 years were 896 (60.4%). 50.4% of the students are from sciences and 49.6% are from non-science oriented discipline. All the participants agreed that they made use of technology in the course of

their study, while the frequency of usage revealed that 84.8% used technology daily and the remaining 15.2% used it twice or thrice per week.

On the accessibility means used by the participants, 66.4% of the respondents used their mobile phones, 22% made use of laptop, while the remaining 11.6% made use of other means like desktop at cybercafé. Statistics on the available resources used by the participants revealed that 89.1% were on social network engines while 32.9% made use of electronic libraries, 7.2% used blogs/forums, and 61.6% made use of search engines.

**Table 2: Correlation matrix of the Relationship between technology use, self-efficacy and students' academic standing**

Variables	Technology use	Self-efficacy	Academic standing
Technology use	1.000	.511**	.397*
Self-efficacy	.511**	1.000	.488**
Academic standing	.397*	.488**	1.000

\*\* Correlation is significant at the .05 level (2-tailed)

\* Correlation is significant at the .01 level (2-tailed)

The results in Table 2 indicated that there is a significant relationship among the variables of the study. A significant high relationship was observed between technology use and self-efficacy ( $r=.511$ ) as well as students' academic standing ( $r = .397$ ). Also, positive relationship was observed between students' academic standing and self-efficacy (.488). The findings imply that technology use, self-efficacy and students' academic standing are positively related to one another.

**Table 3: Model Summary of the multiple Regression Analysis of the significant influence of technology use and self-efficacy on students' academic standing**

	R	R <sup>2</sup>	Adj. R <sup>2</sup>	SE	Change Statistics				
Model					R <sup>2</sup> Change	F Change	d f 1	d f 2	Sig. F Change
Predictor Variables	.583	.340	.340	13.009	.340	23.709	2	1483	.013

a. Predictions: (Constant), Technology Use and Self-efficacy

b. Dependant Variable: Academic Standing

The results in Table 3 revealed a significant influence of technology use and self-efficacy on students' academic standing ( $R = .583$ ;  $R^2 = .340$ ;  $F_{(2,1483)} = 23.709$ ;  $P < .05$ ). This revealed that technology use and self-efficacy accounted for 34% of the variance on students' academic standing. This finding rejected the hypothesis, which stated that there is no significant influence of technology use and self-efficacy on students' academic standing.

**Table 4: T-test analysis showing difference in students' perception of service quality based on gender, career choice, and school type**

Gender	N	X	SD	Df	t-cal.	t-crit.	P
Male	647	68.518	17.432	1481	1.217	1.96	Not Significant
Female	836	69.011	16.687				
Science	748	70.899	18.751	1481	3.428*	1.96	Significant
Non-Science	735	65.547	15.883				

The results presented in Table 4 revealed that the obtained value of t is 1.217 for the gender difference in students' academic standing which is less than the t- critical value of 1.96 and 0.05 level of significance. This implies that there is no significant gender difference. Further analysis of the result based on the respondents' mean scores reveal that female students with average mean score of 69.011 are better off in their academic standing than their male counterparts with a mean score of 68.518.

The section that measures the difference between science and non-science students revealed a significant difference between science and non-science students' academic standing. The science students had an average mean score of 70.899 over their non-science counterparts with a mean score of 65.547.

### Discussion of Findings

Findings of the first hypothesis revealed that technology use, self-efficacy and students' academic standing are positively related to one another. It can be deduced individual belief about themselves to achieve educational goals and appropriate use of technology can enhance their academic success or career. This finding corroborates the earlier findings of Aramugam (2011) students have at their fingertips the opportunity to explore the world and take in vast amounts of information along the way in order to improve their learning and increase academic performance. Also, the studies of Adenuga & Ayodele (2009); Bandura (1997); Mabekoje (2010) and Salami (2004) support this finding that self-efficacy has a strong relationship with academic success.

Technology use and self-efficacy was reported by the outcome of this research account for 34% of the variance on students' academic standing. The finding of this study is line with the position of previous research that technology (Quan-Haase, 2007; Hargittai, 2007; Malaney, 2005) and high self-efficacy (Adenuga & Ayodele, 2009; Forester, Kahn, & Hesson-McInnis, 2004) are important factors related to students successfully implementations of academic goals.

The last findings show no gender difference in students' academic standing while a significant difference was observed based on discipline. Although, this finding revealed no significant difference based on gender but a significant difference on discipline, yet this could be due to the students' orientation about their field of study.

### Conclusion and Recommendations

Higher institutions around the world are moving rapidly to introduce technologies (ICTs) into all aspects of teaching and learning processes not just as a means of striving to get accreditation and be more competitive in the global market but to improve academic excellence. It should be noted, however, that students' academic standing can be influenced negatively by students' maladaptive behaviour and unseriousness, it can also be improved through strong self-efficacy and technological use.

As noted by Naeema (2011) formal education is recommended for students to gain a better understanding of the goals, purposes, and benefits behind such new communicational tools. Encouraging academic staff as well, is another realizable recommendation. This will lead directly to encouraging group academic communication in a way that will decrease students' fruitless computer usage. It will also extend their efforts to learning and problems solving rather than endless youthful social communication and achieve better utilization of the Internet and available technologies rather than wasting time and money in unproductive applications, which will eventually affect even their commitment to learning.

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