

Relationship between students' attitudes toward ICT and their achievement in ICT
at the University of Cape Coast

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Published by: *International Journal of Basic Education*, Vol 1 (2010)

Abstract

The study investigated if a statistical relationship existed between academic achievement and achievement of students in ICT. Two research instruments were used to collect data. One was the end of semester examination in ICT involving hands-on computer exercises in MS-Word and SPSS was used to measure students achievement and a questionnaire which was used to measure attitude. On Students' achievement in ICT, there was no difference between the mean scores of the undergraduate students and postgraduate students. With regards to Students' attitudes toward ICT both postgraduates and undergraduate students both showed positive attitudes towards ICT. Also, the relationship between attitudes and achievement there is a moderate correlation between undergraduate students attitudes to ICT and their achievement in ICT where as among the postgraduate students there was a weak correlation between postgraduate students attitudes to ICT and their achievement in ICT. It is recommended that students should be encouraged to develop positive attitudes towards ICT. This may improve their achievement in ICT examinations.

Introduction

As educational systems seek to prepare students for work force, computer literacy becomes vital in higher education. The introductory course in computer application in education is a key component both of the curricula of B. Ed programmes run in the Department of Science and Mathematics Education and the M.Phil programmes run in the Faculty of Education, University of Cape Coast. It is prudent that the course be successfully taught because it is often the only opportunity for many students to acquire the fundamentals of computers use and its applications in education. As Carlson (2002) indicates, success in ensuring that teachers acquire the skills and knowledge they need to use technology effectively opens the door to all kinds of new educational opportunities for both teachers and students, and

downstream economic opportunities for graduating youth and their countries. Yet, there are many difficulties with this course in particular as it seeks to accommodate very large numbers of enrolled students, and its method of delivery is continuously evolving. One of the difficulties most often cited by faculty who conduct research regarding this course is the variability in students' computer experience, both real and perceived, which makes it very difficult to perceive how to design a course that is appealing and useful to all their students.

Literature exists that suggest that students' perceptions of their computer experience influence their behaviour in the course because they rely on these beliefs when making decisions about their actions (Levine & Donitsa-Schmidt; Levine & Donitsa-Schmidt; Low et al.; Smith et al.; Smith et al. as cited by Torkzadeh, Pflughoeft & Hall, 1999). While many students approach their training positively and master the skills necessary for the effective application of computers, others develop a dislike for technology. Aiken as cited by Yalcinalp (2005), described the attitude as "learned predispositions to respond positively or negatively to certain objects, situations, concepts or persons (p. 2). Fuchs and Woessman (2004) showed that while the bivariate correlation between the availability of ICT and students' achievement is strongly and significantly positive, the correlation becomes small and insignificant when other student environment characteristics are taken into consideration. Zhang and Espinosa (1997) had earlier reported that attitude predicts the need for learning computing skills which will in turn enhance ICT or computing skills.

Karsten and Roth (1998) show that higher levels of computer self-efficacy corresponds to greater achievement of computer competence among other things. Summers (1990) identifies lack of knowledge and experience in computing as one of the most common reason for teachers' negative attitudes towards computers. Jegede (2007) reports that ICT attitude bears significant relationship with and also predicts

competence. Liu, Maddux and Johnson (2004) also report that computer attitudes influence computer learning mediated by time. In their study of the relationship between ICT attitudes, attitudinal constructs and competence of selected Nigerian teachers, Jegede, Odusola and Olugbenga (2007) found “a significant correlation between attitudes toward ICT and computer competence” (p. 174).

However, several studies have shown that students' perceptions are strongly, but not perfectly, correlated with their actual computer experience (Case et al.; Compton et al.; Dyer et al.; Jones & Pearson; Levine & Donitsa-Schmidt; Pierce et al. as cited by Hernes, Hestmann & Haaland, 2002). Hernes, et al (2002) also reported that attitude does not bear a strong relationship with competence. Research results bordering on the relationship between computer attitudes and competence are very scanty and have yielded conflicting results.

Purpose of the study

The purpose of this study was to investigate if a (statistical) relationship existed between academic achievement and achievement of students in ICT. The study specifically explored the following research questions and also tested the null hypotheses below:

Research questions

1. What is the achievement level of undergraduate students in ICT end of semester examinations?
2. What is the achievement level of postgraduate students in ICT end of semester examinations?
3. What are the attitudes of undergraduate students toward ICT?
4. What are the attitudes of postgraduate students toward ICT?

Null hypotheses

1. There is no significant relationship between undergraduate students' attitudes toward ICT and their achievement in ICT.
2. There is no significant relationship between postgraduate students' attitudes toward ICT and their achievement in ICT.

Method

This study focused on the analysis of undergraduate and postgraduate students' attitudes and achievement toward computers. Attitude scales for computers (ATC) was developed by the researcher to assess students' attitudes toward computers. The achievement of the students was based on their final grades from this computer course.

Research participants

The research participants involved 11 female and 16 male undergraduate students offering B.Ed Health Science Education and 22 female and 33 male postgraduate students reading various M. Phil programmes in the faculty of education and took a course in Computer Applications in Education course during second semester of 2007/2008 academic year.

Instrumentation

End of semester examination in ICT consisted of hands-on computer exercises in MS-Word and SPSS which the students saved on the computer. The questionnaire was divided into two sections; the first part dealt with bio data and the second part on attitudinal responses. All the items in the survey were Likert-type items with four categories: Strongly Disagree, Disagree, Agree, and Strongly Agree. These categories were coded 1, 2, 3 and 4, respectively. Negatively worded items were reversed as 4 – strongly disagree, 3 – disagree, 2 – agree and 1 – strongly agree. The instrument was pilot tested on MPhil students in the School of Agriculture, University

of Cape Coast for validity and reliability. The Cronbach Alpha test for reliability for the items was 0.87. The students wrote their respective registration numbers on the questionnaire so their achievement in the ICT examination could be matched to their individual responses/questionnaires.

Data collection procedure

End of semester examination in ICT was conducted at the end of the semester and their achievement in the examination was recorded. A questionnaire was also administered to the research participants immediately after the examination. The completed questionnaires were collected on the spot.

Data analysis

The responses on the attitude scale were scored and analyzed using Spearman correlation, means, standard deviation and means of means of the responses and multiple regression analysis. The analysis was done employing SPSS version 13 developed by Hull and Wie (1986). A mean score of 3.0 or higher indicates a positive attitude towards ICT, while a mean score within the range of 2.5 and 2.9 indicates trends towards positive attitudes. Also, a mean within the range of 2.4 and 2.1 indicates a trend towards negative attitude towards ICT while a mean lower than 2.0 indicates negative attitudes towards ICT.

Results

The results from this study are presented in three parts. The first part deals with the distribution of scores obtained by undergraduate and postgraduate students, the second part deals with their attitudes to ICT whilst the third part deals with the relationship between students' attitudes towards ICT and their achievement in ICT.

Students' achievement in ICT

Table 1 presents the distribution of scores of both undergraduate and postgraduate students obtained in the ICT end of semester examination. The results from Table 1 show that the minimum scores obtained by the undergraduate students

was within the range of 50-59 (29.6% of students obtained this score) and the maximum score was within the range of 90-99 (11.2%). The percentage mean score for the undergraduate student was 74 with standard deviation of 15.6. The percentage mean score for the postgraduate students was 74 and standard deviation of 10.1. There was no difference between the mean scores of the undergraduate students and postgraduate students. However, a look at the standard deviations shows that the scores of the postgraduate students were more homogenous than that of the undergraduate students

Table 1: Distribution of undergraduate and postgraduate students' scores

score	undergraduate	Postgraduate
	Freq (%)	Freq (%)
30-39	0 (0)	1 (1.8)
40-49	0 (0)	0 (0)
50-59	8 (29.6)	0 (0)
60-69	1 (3.7)	16 (29)
70-79	5 (18.5)	22 (40)
80-89	10 (37.0)	14 (25.6)
90-99	3 (11.2)	2 (3.6)

Students' attitudes toward ICT

Table 2 presents the mean and standard deviation of undergraduate and postgraduate students' responses to attitudinal questions. Out of a total score of 84 which is the most positive attitude score and 21 being the least negative attitude score, the postgraduate students scored 64.2. Results from Table 2 show that 16 out of 21 of the postgraduate students scores had a mean score of 3 or higher. Two postgraduate students scores had a mean between 2.5 and 2.9 indicating trends towards positive attitudes towards ICT. Also, two postgraduate students scores had a mean within the range of 2.4 and 2.1 indicating a trend towards negative attitude towards ICT and 1

postgraduate students score had a mean lower than 2.0 indicating a negative attitude towards ICT.

Out of a total score of 84 which is the most positive attitude score and 21 being the least negative attitude score, the undergraduate students scored 66.3. This indicates that the undergraduate students had a positive attitude towards ICT. Results from Table 2 also show that 16 out of 21 of the items had a mean score of 3 or higher. With the remaining 5 scores, 3 undergraduate students scores had a mean between 2.5 and 2.9 indicating trends towards positive attitudes towards ICT. Two undergraduate students scores had a mean lower than 2.0 indicating a negative attitude towards ICT.

Table 2: Mean scores of students' responses to attitudinal questions.

S/N	Statement	Undergraduate		Postgraduate	
		Mean	SD	Mean	SD
1	Working ICT exercises is fun for me	3.0	.877	2.8	.811
2	I hate ICT	3.9	.267	3.6	.686
3	ICT is a difficult subject.	3.1	.801	3.0	.805
4	I do not like studying ICT	3.7	.480	3.5	.716
5	ICT is interesting for me	3.4	.844	3.5	.505
6	I like studying ICT	3.3	.669	3.2	.722
7	I like ICT	3.6	.700	3.4	.527
8	ICT is easy for me	2.6	.636	2.4	.561
9	I wish I do not come into contact with ICT	3.8	.641	3.6	.712
10	The technical language puts me off using computers	3.3	.832	3.1	.658
11	I am not what I would call a computer person	1.9	.730	2.3	.737
12	When I have difficulties using a computer I know I can handle them.	2.8	.834	2.6	.593
13	I have never felt myself able to learn how to use computers	3.3	.734	3.2	.637
14	I find using computers confusing	1.7	.813	1.8	.621
15	I find many aspects of using computers	3.4	.751	3.2	.599

	interesting and challenging				
16	I find using computers enjoyable	3.3	.775	3.2	.722
17	I would want to study ICT in Education even if it was not compulsory	2.9	.829	3.2	.834
18	The use of ICT has helped me in collecting data for my project work	3.2	1.00	3.1	.780
19	The use of ICT has helped me in analysis of data	3.4	.847	3.0	.839
20	The use of ICT has helped me in presentation of data	3.4	.792	3.1	.762
21	The use of ICT has helped me to retrieve information from the internet	3.3	.775	3.4	.688
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Total		66.3	15.6	64.2	14.5
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Relationship between attitudes and achievement

Pearson's correlation between undergraduate students attitudes toward ICT and their achievement in ICT was .432. According to Black (1999), $.3 < |r| < .7$ indicates moderate correlation. There is therefore a moderate correlation between undergraduate students attitudes to ICT and their achievement in ICT. Pearson's correlation between postgraduate students attitudes toward ICT and their achievement in ICT was .185. According to Black (1999) $0 < |r| < .3$ indicates a weak correlation. There is therefore a weak correlation between postgraduate students attitudes to ICT and their achievement in ICT.

Discussion

The general achievement of the undergraduate students was good as the average score was 74% and the standard deviation was 15.6. Also, the general achievement of the postgraduate students was good as the average score was 74% and the standard deviation was 10.1. Forty percent of the students score was within the average score. Both set of students showed positive attitudes toward ICT. The majority of the postgraduate students showed positive attitudes (had a mean score of 3.0 or higher). Also, majority of them found the use of computer enjoyable (mean =

3.2). However, one item in the postgraduate students' scores showed negative attitude (mean = 1.8). The majority of the undergraduate students' scores showed positive attitudes (had a mean score of 3.0 or higher) Also, majority of them found the use of computer enjoyable (mean = 3.3). However, two items in the undergraduate students' scores showed negative attitude (mean = 1.9 and 1.7).

Both groups of students had the same average score of 74%. Perhaps, one would have expected that the postgraduate students would have had a higher score in ICT examinations than the undergraduate students. This is in contrast with the findings of Summers (1990) as this was their second exposure of the postgraduate students to such a course. The issue is that the postgraduate students were over confident and did not prepare for the examination; thus performed averagely.

Conclusions and Implications

Generally postgraduate and the undergraduate students had similar positive attitudes toward ICT. Their achievement in ICT examination was also above average. However, the study showed that generally positive, attitudes toward ICT does not necessarily imply the student had higher score in ICT. This shows that it is not enough for students to develop positive attitudes toward ICT in order to attain higher score in ICT.

Recommendations

Students should be encouraged to develop positive attitudes towards ICT. This may improve their achievement in ICT examinations. Finally, students should neither be prevented nor should be encouraged too much to use computers. They should be encouraged on a moderate level. The quality of their involvement might be making the difference.

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