The Effects of Information and Communication Technology (ICT) on the Academic Performance of Accounting Students

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Abstract
Purpose: The purpose of this study is to identify the effects of ICT on the academic performance of accounting students
Design/methodology/approach: The variables measured were students' ICT skills, educational ICT facilities, lecturers' utilization of ICT for teaching and students' attitude toward ICT. 280 questionnaires were distributed to accounting students attending one of the private universities.
Findings: Findings indicate that educational ICT facilities has a significant positive relationship with the academic performance of accounting students. This implies that ICT helps increase flexibility when delivering education to students as they have wide access to information anytime and anywhere. Interestingly, the findings also show that attitude towards IT has a significant negative relationship with academic performance. It indicates that a positive attitude towards IT can adversely affect academic performance.
Research limitations/implications: This study focused only on a selected sample, while the small sample size might not portray or reflect the actual results of this study. Moreover, the results might not be applicable to other settings that have not been tested in this study. Thus, the findings might differ in other settings or circumstances.
Practical implications: The results of this study will impart essential knowledge about ICT that can be used when preparing accounting undergraduates to face competition in the industry or job market. Results show that the readiness of accounting students equipped with the necessary skills in ICT is essential for fulfilling one of the fundamental principles of professional competence and due care.
Originality/value: This research was conducted to close the gap and discrepancies of previous studies and provide the latest findings on the relationship between ICT and students' performance, especially accounting students.

Keywords: ICT, Information Technology, Digital Learning, Academic Performance, Accounting Education

Introduction

Information Technology (IT) as well as Information and Communication Technology (ICT) must not be confused as both terms actually come from two different fields. IT involves computers, software, networking and IT infrastructure used for relaying or managing information in day-to-day activities for personal or working purposes. ICT refers to the use of computer-based communication technology that serves as a network for seeking information. This includes computer hardware and software that can be used for transferring information resources (Goay and Wong, 2003). ICT is important not just for communication but also as an educational tool intended for teaching, learning and research purposes. This is especially important during the current Covid-19 pandemic, which has pushed schools, higher education institutions and training providers to cope with technology and ensure that effective learning continues (Chin, 2020). Thus, knowledge of how students engage in ICT tools plays a vital role in managing and leveraging technology for enhancing students' learning.

In the last two decades, the direct link between using ICT, students' study habits and academic performance have been the focus of numerous studies. Some previous studies have shown that ICT could help students with their learning by improving communication between them and lecturers (Valasidou and Bousiou, 2005). Tinio (2002) stated that ICT's potential is increasing, specifically in accessing as well as improving relevance and quality of education in developing countries. Ismail and Mahmood (2018) found that the use of multimedia and technology have a significant positive influence on students' academic performance and concluded that the use of technology in enhancing the learning process requires changes in the learning mode by applying new technological strategies to meet educational objectives. In addition, the National Institute of Multimedia Education (2009) in Japan found that exposure to educational ICT has positive consequences on students, especially in terms of knowledge, comprehension as well as practical and presentation skills. This means that the student's academic worth is now being reflected in higher order critical skills as the student shifts from lecturer-based approach to student-based approach when applying ICT in everyday learning. Elsaadani (2015) iterated that ICT skills is one of the most important skills that should be possessed by accounting graduates as it is highly demanded in the industry. Therefore, to further explore this issue, this study intended examine the effects of ICT on students' academic performance, especially accounting students.

Literature Review

ICT and the Academic Performance of Accounting Students

The relationship between the use of ICT and students' performance in educational institutions is not really clear and there are some contradictory findings in previous literature. Earlier studies have failed to provide a clear agreement about the effects of ICT on students' achievement (Youssef and Dahmani, 2008). Effects of ICT on teaching and learning of accounting is immeasurable. Ngozi (2001) stated that the benefits of IT benefits are numerous. Fuchs and Woessmann (2004) found that there is a positive relationship between the effectiveness of computer usage for instruction and students' academic achievements. Bonnet and Dunne (1997) argued that the use of ICT can positively transfer knowledge to students. The availability of ICT resources enhances learning by making education less dependent on different teaching qualities and making education available at home throughout the day (Mbwesa, 2002). Furthermore, the availability and use of ICT can help students exploit enormous possibilities for acquiring information for schooling purposes and increase learning through communication (Riel, 1998). On the other hand, Leuven (2004) concluded that there is no evidence indicating a relationship between educational use of ICT and students' academic performance. Tinio (2002) also disagreed that ICT's potential is increasing, especially in terms

of access as well as improving the relevance and quality of education in the country. Students may use ICT for leisure time activity purposes, which leads to less time for studying. Online gaming and increased communication channels do not necessarily mean increased achievement (Youssef and Dahmani, 2008). Research on the use of computers in classrooms and its influence on students' achievements has reported no influence or negative influence when using computers for instructional purposes (Angrist and Lavy, 2002; Rouse and Krueger, 2004).

Theoretical Framework and Hypothesis Development
Theory of Technology Acceptance Model
The theory used to support this study is the Technology Acceptance Model (TAM). TAM posits that students' interest to use the computer is influenced by perceived usefulness and perceived ease of use. The TAM model was initially developed by Davis (1989) and it is actually based on the theoretical grounding of the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975). TRA is a well-known model in the social psychology domain, which posits that a person's behaviour is determined by an individual intention to perform a particular behaviour. In other words, TAM defines how users should accept or how to use specific technology as well as describes the function of causal relationships between perceived usefulness and perceived ease of use of ICT. The TAM assumes that user adoption and effective use result from the intention to use a system, which is in turn is affected by perceived usefulness and perceived ease of use of ICT. The basis for this form has been found in previous studies suggesting that higher interaction, usage, or interest levels produce better learning effects (Jung, Choi, Lim and Leem, 2002). TAM is further used to explain the relationship between the impact of ICT usage and the academic performance of accounting students.

Students' ICT Skills and Academic Performance of Accounting Students
Elsaadani (2015) iterated that a group of international accounting associations has determined that ICT skills is one of the most important skills that should be possessed by accounting graduates. General ICT skills are categorized into two groups, which are the use of software and hardware tools (Windows, word processing, spreadsheet applications, presentation software, database applications, Web applications, mobile applications, mobile devices, hardware and software installation, principles of networks) and the responsible use of internet services (e-mail, Web browsing, digital authoring, electronic databases, and principles of digital communication) (Candy, 2000). Furthermore, distribution, use, and practices as well as ICT skills change rapidly as new applications replace old ones, and new tools and applications are introduced every month (Ilomäki, 2008). Wessesls (2007) studied the issue of ICT offered to accounting students and found that the cause of the gap between skills acquired by accounting graduates and the required level needed by the profession is due to the limited use of accounting software packages in the course of their study. Furthermore, Luna-Maldonado (2016) found that technological skills in the classroom have a significant positive influence on academic performance, while technological competence is needed for new educational possibilities and enhancement of critical thinking. Hence, the following hypothesis was formulated.

H_1: There is a significant relationship between students' ICT skills and the academic performance of accounting students

Educational ICT Facilities and Academic Performance of Accounting Students

Miller, Crossdale-Ovwidoand Mordi (2012) reported that ICT facilities, such as the internet, video conferencing, database, computer systems, networking, tele-conferencing etc. have not only changed the nature and method of teaching but has also changed the role of accounting educators and their students. ICT has imposed innumerable challenges, especially in the area of utilizing ICT facilities in teaching and learning of accounting education courses (Ezeani and Akpotohwo, 2014). Fuchs and Woessmann (2004) had used international data from the Programme for International Student Assessment (PISA). This indicates that although the bivariate correlation between the availability of ICTs and students' performance is strongly and significantly positive, the correlation becomes small and insignificant when other environmental characteristics are taken into consideration. In addition, the point is that the more the students benefit from education's physical environment, the better their achievement. Thus, increasing physical investment in education must lead to better results and performance (Youssef and Dahmani, 2008). Therefore, the following hypothesis was formulated.

H_2: There is a significant relationship between educational ICT facilities and the academic performance of accounting students

Utilization of ICT in Teaching and the Academic Performance of Accounting Students

The effective utilization of ICT in the teaching and learning of accounting courses is beyond the acquisition of resources, such as an adequate curriculum, instructional strategies, competent teachers, which allows the programme's products to achieve the relevant skills needed in the business market (Ezeani and Akpotohwo, 2014). The benefits of ICT can be gained only when educators are willing to explore new opportunities by changing classroom practices using ICT (Harris, 2002). Educators' use of ICT can help promote the learning environment's quality as it has a catalytic effect on the interaction and reception of information. It makes the teaching process more attractive by using ICT and students will be able to easily capture the lesson being taught. This directly contributes to students' academic performance. Clotfelter (2007) stated that teachers' experience and teachers' license test scores have a positive impact on students' achievements. The lack of significant effects of these teachers' characteristics should not be interpreted as evidence that teachers have no impact on students' academic performance. Teacher quality, measured by a teacher's fixed effects, has considerable impact on students' achievements (Rockoff, 2004). In other words, a teacher's quality may be important, but it is not well captured by the teacher's level of experience, certification, and education. Hence, the following hypothesis was formulated.

H_3: There is a significant relationship between the utilization of ICT in teaching and accounting students' academic performance.

Students' Attitude towards ICT and Academic Performance of Accounting Students

Students could improve their achievement in examinations if they are encouraged to develop positive attitudes towards ICT (Ayebi-Arthur, 2010). Mbah (2010) found that there is a positive impact on students' study habits and academic performances, especially when information can be accessed, is easily available and facilitated by ICTs in efforts to achieve academic success. On the contrary, Islam and Fouji (2010) stated that there is a negative impact on students' attitude towards ICT. In this digital world, students do not assume that ICT is a tool that can enhance their academic performance. Based on their research, majority of students did not agree that ICT can enhance their academic performance. In addition, Al-Khadashand Al-Beshtawi (2009) found that there is no significant relationship between an attitude about using

computers and students' performance, which will be a value-added element when studying computer skills related to accounting. Therefore, the following hypothesis was formulated.

H_4: There is a significant relationship between students' attitude towards ICT and academic performance of accounting student

Research Methodology
Data collection procedures and measurement of variables
Study data were collected using questionnaires, which were distributed to 280 accounting students from one of the private universities in Malaysia. The questionnaire was divided into five sections, comprising section A concerning demographic profiles and the dependent variable, while section B to Section E was specifically reserved for the independent variables in this study. However, the variables included in section B until section E used a five-point Likert scale as a tool for measuring the variables. Each section comprises of 5 to 10 questions and the scales based on a five-point Likert scale, where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree on the circumstances that could affect the accounting students' academic performance. The average score for each category was used to represent the result for each independent variable. Academic performance, which was the dependent variable, was measured based on the respondents' Cumulative Grade Point Average (CGPA) in the recent semester at the time the data were collected.

Data analysis
The regression analysis was performed to test the relationship between independent variables and the academic performance, which was the dependent variable. The empirical models used to test the hypotheses are shown below.

$$AP = \beta0 + \beta_1 ICT\ skill + \beta_2 ICTfaci + \beta_3 ICTuti + B_4 AttICT + e$$

Where,

AP	=	Academic performance
$\beta_1 ICTskill$	=	Student's ICT skill
$\beta_2 ICTfaci$	=	Educational ICT facilities
$\beta_3 ICTuti$	=	Educators' Utilisation of ICT
$B_4 AttICT$	=	Students' attitude towards ICT
e	=	Error term

Findings
Descriptive analysis
The findings in Table 1 represent respondents' information consisting of gender, year of study and CGPA. All of the 280 questionnaires distributed were successfully returned. The results show that majority of respondents are female (222 students or 79.3%), while the rest were male (58 students or 20.7%). As for "the year of study", questionnaires were distributed equally among first year to fourth year of study students. Thus, each group consisted of 70 students, totalling 280 students overall. Based on the cumulative grade point average (CGPA), 43.2 percent had a CGPA of between 3.50 to 4.00, 39.6% had a CGPA of between 3.00 to 3.49, 13.9% had a CGPA of between 2.50 to 2.99, 2.9% had a CGPA of between 2.00 to 2.49 and 0.4% had a CGPA of below 2.00

Table 1: Respondents' Information

Demographic Factors	Category	Frequency	Percentage (%)
Gender	Male	58	20.7
	Female	222	79.3
Year of studies	First year	70	25
	Second year	70	25
	Third year	70	25
	Fourth year	70	25
CGPA	< 2.00	1	0.4
	2.00 - 2.49	8	2.9
	2.50 - 2.99	39	13.9
	3.00 - 3.49	111	39.6
	3.50 - 4.0	121	43.2

Based on the Kolmogorov-Smirnov (K-S) test, as shown in Table 2, all variables show a significant value of $p < 0.01$, which indicates non normal distribution of data. Hence, the Spearman correlation test was conducted. Prior to performing the regression analysis, data were transformed into normal scores (Young, 1998) in order to fulfil the requirements of linear regression and obtain a normal distribution data (Field, 2013). The advantage of using normal scores is that the results from the test would have exact statistical properties since the significance level can be determined. Besides, both the F-test and t-test as well as the regression coefficients from the transformation, provide a more meaningful interpretation.

Table 2: Descriptive statistics for dependent and independent variables

	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis	K-S Test
CGPA	1.000	5.000	4.225	0.818	-0.911	0.528	0.000
β ICTskill	1.300	5.000	4.030	0.582	-1.033	3.276	0.000
β ICTfaci	1.462	5.000	3.840	0.645	-0.697	1.177	0.000
β ICTuti	1.500	5.000	4.069	0.544	-0.883	2.698	0.000
BAttICT	1.909	5.000	4.128	0.553	-0.534	1.251	0.001

Correlation Analysis
Table 3 summarizes the statistical results of the correlation coefficient analysis. Results show that none of the coefficients exceed 0.8, which indicates strong multicollinearity (Gujarati, 1992). Therefore, there is an absence of strong multicollinearity among the variables.

Table 3: Spearmen Correlation

	ICT_Skills	ICT_Facilities	Utilization_of_ICT	Attitudes ICT
β ICTskill	1.000	0.408	0.423	0.501
β ICTfaci		1.000	0.451	0.396
β ICTuti			1.000	0.605
BAttICT				1.000

Multiple Regression analysis
Results of the multiple regression analysis concerning the relationship between independent variables and academic performance disclosure is presented in Table 4. The results indicate that there is a significant relationship between educational ICT facilities and academic

performance (p-value of 0.046). The higher the number of ICT facilities for educational purposes, the higher the academic performance of accounting students. Hence, Hypothesis 2 (H2), which indicates that there is a significant relationship between educational ICT facilities and academic performance of accounting students is supported. Youssef and Dahmani (2008) stated that increased physical investment in education leads to better results and performance. This finding is consistent with Fuchs and Woessmann (2004), who found that the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive.

There have been some interesting findings on the relationship between attitudes toward ICT and academic performance. Results show that positive attitudes towards ICT have a negative relationship with academic performance. It implies that positive attitudes toward ICT might adversely affect students' academic performance. This might happen because allowing certain students to use computers will distract them from focusing on the completion of tasks. Islam and Fouji (2010) also stated that students do not consider ICT as a tool for enhancing and increasing their academic performance. This result is consistent with Hernes et al (2002), who reported that attitude does not bear a strong relationship to competence.

However, the relationship is insignificant for the influence of ICT skills on students' performances. Thus, Hypothesis 1 (H1), which states that there is a significant relationship between accounting students' ICT skills and their academic performance is not supported. This result appears to be in line with the study conducted by Khan and Khan (2015), who failed to provide a clear explanation for the effect of ICT investments on students' achievement as students' performances focused more on their characteristics as well as educational ICT facilities provided. This is further supported by Elsaadani (2015), who indicated that the performance of accounting students and their exhibiting of ICT skills is still questionable despite the government and educational institutions' efforts to incorporate ICT into the educational system. In contrast, Claroa, Hinostrozab and Jara (2015) found that computer users differ in their performance if they possess necessary competencies, abilities and attitudes. Ilomäki (2008) also stated that the development of a student's expertise is affected by the student's level of ICT skills.

Lastly, it was observed that educators' utilization of ICT had no significant influence on students' academic performances. Therefore, Hypothesis 3 (H3), which states that there is a significant relationship between lecturers' utilization of ICT and accounting students' academic performances is not supported. However, the result is consistent with Youssef and Dahmani (2008), who reported no significant relationship between lecturers' education and qualification and students' academic performances. The reason is that lecturers' characteristics lack effectiveness and should not be seen as a strong indicator of a good academic performance. However, Rivkin and Hanushek (2005) strongly suggested that students' performances are not well captured by a teacher's level of experience, qualification, and education but rather, the teacher's quality could play an important role in students' academic performances.

Table 4: Multiple regression result

Variables	Coefficients	t-statistics	Sig.t
(Constant)		-0.820	0.413
β ICTskill	0.113	1.558	0.120
β ICTfaci	0.140	2.000	0.046
β ICTuti	0.071	0.895	0.372
BAttICT	-0.199	-2.465	0.014

$R^2 = 0.198$., F-statistic $= 2.876, p = 0.023$

Discussion and Conclusion

The aim of the study is to determine the effects of ICT on the academic performance of accounting students registered in one of the private universities. Data of the study were obtained by distributing 280 questionnaires to students pursuing the Bachelor of Accounting degree at the university. The questionnaires were distributed equally among first, second, third and final year students. Findings indicate that only 'educational ICT facilities' and 'attitude towards ICT' have a significant relationship with students' academic performances. This implies that sufficient and appropriate educational ICT facilities and resources have a positive impact on students' academic performances. Educational ICT facilities help students to access, store, process, apply and disseminate information (Buba, 2011). Findings also strongly indicate that 'attitude towards ICT' might impair students' performances. Even though technology could have a positive impact on students, however, being obsessed with technology could have an adverse impact as well. It could cause psychological and physical issues that later affect their performance. Lastly, for further improvement, future studies should cover wider areas or settings to allow its findings to provide greater generalizability. A wider coverage is recommended to allow a greater number of respondents for data collection. Future studies should be conducted in other settings to ensure more accurate and reliable data, thus, making it applicable in most circumstances.

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