

Adoption of ICT in Learning: Perceptions from Technical College Students in Malawi

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Research Article

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Abstract

Background: There has been a growing interest to use Information and Communications Technology (ICT) in the field of education. Most countries have made strides to adopt the use of ICT in teaching and learning. A lot of studies have been made to find out about attitudes of stakeholders in education on adopting the use of ICT.

Aim: Considering that Malawi has recently been promoting the skills and vocational trades, this study was aimed at finding out how students in the technical and vocational colleges perceive the use of ICT in learning.

Methods: A quantitative research study was undertaken among 208 students using a questionnaire. Descriptive statistics and analyses of variance were used to analyze the results using IBM SPSS version 23 Software.

Findings: The study revealed that most students use ICT for recreational purposes than pedagogical. It was also revealed that there are no differences in perceptions of using ICT in learning between male and female students, although differences were noted between students coming from different locations.

Recommendation: We recommend the use of ICT in technical and vocational college as the world is changing in the manner the business is being transacted as witnessed with the impact of COVID-19. Further we recommend authorities to put more attention in the development of ICT learning resources as it has the power to drive the economy in all sectors.

Introduction

This decade has experienced a massive development in the world of computer science. Among the notable advancements is the progress taken in information and communications technology (ICT). Information and communications technology has taken center stage in every field of work. Lately, a growing interest has arisen in the field of education to adopt and use ICT in teaching and learning (Lekopanye, 2014). Just like in other fields, the use of ICT in education is said to be highly motivating and appealing to students than the traditional methods. It is said that its use in the education system makes access to knowledge easier (Deivam, 2013). Most countries have therefore taken positive steps to adopt ICT as an integral part of their education system.

A lot of studies have been conducted regarding to the use of ICT in education, most of which have centered on integration of ICT in secondary schools especially focusing on teachers' ICT skills (Sangrà & González-Sanmamed, 2010), ICT usage and attitude towards ICT (Moseley et al., 1999; Player-Koro, 2012) and also secondary school students' knowledge and pedagogical usage of ICT (Deaney, Ruthven, & Hennessy, 2003; Oulmaati, Ezzahri, & Samadi, 2017).

This study was motivated not only by the insight that the use of ICT in education is being tested in most African countries but also that the Government of Malawi is advocating for ICT skills to the whole country including vocational education (Chapalapata, 2020; Mlanjira Duncan, 2019). Therefore, understanding the perception of ICT from a skills and vocational education student would assist in policy reviewing in the education system of Malawi such that the relevance of ICT in learning should expand into the industrial world.

Research questions

This study aimed at answering the following questions:

1. What are students' usages of ICT?
2. What are students' beliefs and readiness to use ICT?
3. What are students' beliefs and readiness to use ICT in regard to their gender and homes of origin?

Review of related literature

The integration of ICT in education has taken center stage worldwide. The educational systems have adopted this new innovation in technology which has gotten the teaching process evolve from teacher centered to learner centered ("Integrating ICT in Teaching and Learning," 2018). Several studies have revealed that the use of ICT has a positive impact in the process of learning. Some scholars attest that ICT enhances the effect of teaching-learning process by bringing more materials and resources for classroom interaction (Deivam, 2013). Additionally, while others as (Arun K. Mishra and John Bartram, 2002) state, is that use of ICT in teaching and learning helps students to study anytime at their own pace and anywhere as long as there is a computer connected to the internet. It is therefore a necessity that students be exposed to these new technologies and gain proper experience of them (Hakkarainen et al., 2000).

The exposure of students to ICT facilities in the learning process is however, challenging. According to (Czerniewicz & Brown, 2005), there is always a difference when it comes to accessing ICT facilities among students which later affects its use in learning. (Czerniewicz & Brown, 2005) argues after discovering the lack of access to ICT facilities from students in disadvantaged cities of South Africa that this disparity is a huge challenge towards incorporating ICT in education. (Oulmaati et al., 2017) echoes in a recent study conducted in Morocco that despite the efforts by various stakeholders in promoting the integration of ICT in education, there is still a big gap in access to the ICT materials and the use of the same. In the study, it was discovered that most students have no access to ICT facilities once they were outside of the school premises as a result of financial reasons.

While it is true that most students struggle to access these ICT facilities, their use in most cases is not academic related. Studies have revealed various findings about ICT Skills and use among students.

(Umar & Jalil, 2012) studied secondary school students' skills, practices and barriers in using ICT. They found that Malaysian students are at moderate level in term of using ICT for basic and internet application such as accessing and sharing information. In term of using the internet for communication skills, students are at the proficient level. However, students are at the lowest level in using advanced ICT application. Relatedly, (Charles & Issifu, 2015) discovered that students' use of ICT is more social than pedagogical. (Charles & Issifu, 2015) reveal that the students use ICT devices more for communicating with their peers than for supporting their learning activities. Also, (Siddiquah & Salim, 2017) concur that much as the students possess knowledge in using basic packages of computers and other ICT facilities for academic work, they use them to a larger extent for recreational and other purposes.

However, as far as ICT knowledge is involved, students need to have hands-on experience in using various software in computers for maximum utilization of the technology. Woreta, Kebede, & Zegeye, (2013) states from a study that about 51% of the respondents had ICT knowledge and only 46% students utilized ICT while 47% of the respondents never used electronic communication such as email or chat room, and that 39% of the respondents never used Microsoft office. This was a direct result of having no knowledge of computer packages. Woreta et al., (2013) attributed this to family educational background as well as areas of origin for students. Those students whose families had a sound educational background were able to use the computer than those whose background was academically poor. In addition, it was revealed that those who came from rural areas had problems with ICT while those from urban areas were more likely to utilize ICT compared with those from rural areas. Concurring with Woreta et al., (2013) in terms of geographical factor, Asfar & Zainuddin, (2015) explain that there is a wide gap of students' ICT skills between students from urban areas with students from rural areas.

Additionally, in terms of ICT proficiency in relation to gender, Umar & Jalil, (2012) found out in their study that gender had no significant difference in terms of the students' level of ICT skills. In line with Umar and Jalil study but from a different context, Aesaert et al., (2015); Vanderlinde, Aesaert, & Van Braak, (2015) studied the relationship between gender and students' socio-economic status toward students' ICT competences. The study found that students, in general have difficulties in higher order ICT competence. However, in terms of gender, unlike Umar and Jalil's findings, the study showed that female students had better technical ICT skills and higher order ICT competences compare to male students. However, despite female students having higher order competencies than their male counterparts (Basavaraja & Sampath Kumar, 2017). Basavaraja & Sampath Kumar, (2017) revealed in a study done among students in urban schools that there were no statistical differences between male and female students in the use of ICT.

Material And Methods

Study settings

This study was conducted within the three districts of the northern part of Malawi namely: Mzuzu, Karonga and Rumphi. The names of the technical colleges that were purposely sampled are; Sonda Vocational Training Centre, Phwezi Rural Polytechnic, Livingstonia Technical College, Phwezi Women's

Training Centre, Miracle Technical and Mzuzu Technical College. Malawi is located in the southern part of Africa bordering Tanzania, Zambia Mozambique and Zimbabwe with a total population close to 19,413,262 with the majority of its people depending on education and Agriculture (Centres for Disease Control and Prevention, 2019; Munthali & Xuelian, 2020; Ngwira & Watanabe, 2019; WPR, 2020).

Population and sampling

This study purposively targeted the selected vocational colleges with a reason that there were registered by TEVET and were also reputable in the Northern region of Malawi. In coming up with the number of students to be included in the sample convenience sampling was used and targeted a total of 300 students. However, a maximum number of 208 questionnaires were collected representing a 69% response rate.

Instrument development

Using the literature and research questions, questionnaires were developed. The questionnaires consisted of 27 items. The questionnaire was divided into 4 parts: First part had 10 questions on demographics, second part had 7 questions on usage of ICT, the third part had 6 questions on beliefs of students on using ICT and finally, the last part on students' readiness to use ICT had 4 questions. Parts 2, 3 and 4 used questions with a 5-point Likert scale.

Validation and pilot study

Before undertaking the survey, the questionnaire was pilot tested to 15 respondents and some changes were made to the original questions. We calculated the

Cronbach alpha resulting to 0.73 for internal consistence of the instrument.

Data Analyses

Data was analyzed using IBM SPSS Statistics 23. Firstly, descriptive statistics was used to analyze the demographics of the students. Analyses of Variance (ANOVA) was used to study the differences in perceptions with regards to students' gender and homes of origin.

Ethical consideration

To gain access from the vocations colleges we get permission from technical college authorities and the students were engaged right in their institutions of learning. Further all the participants were informed in advance that this study was voluntary and confidential.

Results

Social Demographic Characteristics

Out of the 208 students studied, about 68% (N=142) were male while 32% (N=66) were female. On home of origin, 32% (N=67) came from urban areas, 20% (N=41) from rural areas and 47% (N=98) were from semi-urban. For sources of income, 25% (N=52) were employed, 13% (N=27) had businesses, and 62% (N=129) depended on parents and other guardians. It was recorded that 28% (N=58) had access to personal computers from their homes while 72% (N=150) had no access to computers. The students were in Commercial courses (Administrative studies, Tailoring and fashion design, Cosmetology, Information and Communications Technology), Engineering and Transport courses (Welding and fabrication, General Fitting, Electrical installation, Electronics; Automobile Mechanics, Motorcycle Mechanics), and in Construction courses (Bricklaying, Painting and Decoration, Carpentry, Plumbing).

Table 1: Demographic characteristics

Variable	Category	<i>F</i>	%
Gender	Male	142	68
	Female	66	32
Home origin	Urban area	67	32
	Rural	41	20
	Semi Urban	98	47
Source of Income	Employed	52	25
	Business	27	13
	Parents dependants	129	62
Computer access	Have access Personal access	58	28
	No access to personal computers	150	72

Research question 1: What are students' usages of ICT?

Table 2 below shows results on how students use Information and Communications Technology. From the table, it shows that with an average mean of 4.64, most students use technology for making communication with their friends. Most students however, do not use ICT for pedagogical purpose. The average mean in using ICT for pedagogical purposes fell below average to 2.06.

Table 2: Students' usages of ICT

Items	Percentage					Mean	SD
	Never	Rarely	Sometimes	Often	Always		
Playing games	40.9	39.4	12.9	39.4	2.4	1.88	0.96
Making presentations	39.4	53.4	7.2	0.0	0.0	1.66	0.60
Processing texts	18.6	32.2	32.2	10.1	6.7	2.53	1.11
Publishing materials	28.4	33.7	24.0	10.6	3.4	2.27	1.09
Preparing spreadsheets	44.2	40.9	14.4	0.5	0.0	1.71	0.72
Creating graphics	28.4	36.5	27.4	7.7	0.0	2.15	0.92
Communicating with friends	0.0	0.0	4.8	25.9	69.2	4.64	0.57

Cronbach alpha =0.73

Research question 2: What are students' beliefs and readiness to use ICT?

i. Beliefs of technical students towards using ICT

To assess the beliefs of students towards using Information and Communications Technology for learning, 6 items were used in the questionnaire. Table 3 below shows that the overall mean was 3.09 and the overall standard deviation was 1.15. This shows that the students had a more positive attitude towards learning using Information and Communications Technology, hence, their perception was positive.

Table 3: Beliefs of technical college students towards using ICT

Statement	Mean	SD
I believe that the use of ICT is good for my education	3.08	1.12
I believe that ICT can help me improve my vocational skills	3.19	1.21
I believe that ICT can help me learn more skills from other students	3.28	1.26
I believe that ICT can help me to be more creative in my skills	3.03	1.06
I believe that I understand my course work better if I use ICT	2.89	1.15
I believe that using ICT makes me interested in learning	3.11	1.13
Overall	3.09	1.15

Cronbach alpha = 0.93

ii. Readiness to use ICT for learning

Four items were used to assess the students' readiness in using Information and Communications Technology. From the results in table 3, it shows that the mean was low i.e. and this shows that the students lacked the readiness in using Information and Communications Technology.

Table 4: Readiness of technical college students towards using ICT for learning

Statement	Mean	SD
If it becomes available, I would like to use digital technologies in my education	3.10	1.28
I can fix problems created by digital technology	1.27	.45
I feel confident that I can use digital technologies in my education	2.73	1.39
I will continue using digital technology in learning	2.18	.98
Overall	2.34	1.03

Cronbach alpha = 0.73

Research question 3a: What are the differences in students' beliefs and readiness to use ICT with regards to gender?

i. Differences in beliefs to use ICT in regards to gender.

Descriptive analysis revealed that although male students gave more positive responses (overall mean = 4.16) than female students (overall mean = 4.13) there were no statistical differences in their responses. Table 4 below shows the mean scores and standard deviations in beliefs to use ICT in regards to gender.

Table 5: Mean scores of student's beliefs towards use of ICT based on gender

Statement	Gender	Mean	SD
I believe that the use of ICT is good for my education	<i>Male</i>	4.07	.68
	<i>Female</i>	4.09	.75
I believe that ICT can help me improve my vocational skills	<i>Male</i>	4.18	.72
	<i>Female</i>	4.15	.75
I believe that ICT can help me learn more skills from other students	<i>Male</i>	4.36	.63
	<i>Female</i>	4.33	.69
I believe that ICT can help me to be more creative in my skills	<i>Male</i>	4.04	.66
	<i>Female</i>	3.98	.75
I believe that I understand my course work better if I use ICT	<i>Male</i>	4.16	.71
	<i>Female</i>	4.10	.78
I believe that using ICT makes me interested in learning	<i>Male</i>	4.19	.72
	<i>Female</i>	4.14	.78

ii. Differences in readiness to use ICT in regards to gender.

Descriptive analyses pertaining to the readiness to use ICT in regards to gender reveal that although there were no significant differences from male and female students, the female students still gave more positive responses with an overall mean of 2.52 than male students whose overall mean was 2.23. Table 5 below shows mean scores of students in readiness to use ICT as regarded by gender.

Table 6: Mean scores of students in readiness to use ICT as regarded by gender.

Statement	Gender	Mean	SD
If it becomes available, I would like to use digital technologies in my education	Male	2.98	1.26
	Female	3.38	1.30
I can fix problems created by digital technology	Male	1.26	.44
	Female	1.30	.46
I feel confident that I can use digital technologies in my education	Male	2.57	1.36
	Female	3.06	1.40
I will continue using digital technology in learning	Male	2.11	.94
	Female	2.34	1.03

Research question 3b: What are the differences in students' beliefs and readiness to use ICT with regards to homes of origin?

i. Differences in beliefs to use ICT in regards to students' home of origin.

Much as the responses were positive from students towards beliefs in use of ICT, there were statistical differences observed in regard to students coming from different locations. The students from urban locations gave more positive responses towards believing in use of ICT with an overall mean of 4.50 seconded by students from semi-urban whose overall mean was 4.19. Students from rural areas gave the lowest score with an overall mean of 3.52. Additionally, one-way analyses of variance were performed to find out statistical differences in statements. The following statements had statistical differences: I

believe that the use of ICT is good for my education ($F=54.68$), $p < .05$. I believe that ICT can help me improve my vocational skills ($F=72.92$), $p < .05$. I believe that ICT can help me to be more creative in my skills ($F=32.21$), $p < .05$. I believe that I understand my course work better if I use ICT ($F=69.04$) $p < .05$. I believe that using ICT makes me interested in learning ($F=52.68$), $p < .05$. Table 6 below shows mean scores of students' beliefs toward the use of ICT based on location of students' homes.

Table 7: Mean scores of student's beliefs towards use of ICT based on students' homes of origin.

Statement	Course	Mean	SD
I believe that the use of ICT is good for my education	<i>Urban</i>	4.45	.53
	<i>Rural</i>	3.31	.52
	<i>Semi-urban</i>	4.16	.60
I believe that ICT can help me improve my vocational skills	<i>Urban</i>	4.64	.54
	<i>Rural</i>	3.31	.52
	<i>Semi-urban</i>	4.21	.59
I believe that ICT can help me learn more skills from other students	<i>Urban</i>	4.44	.63
	<i>Rural</i>	4.40	.70
	<i>Semi-urban</i>	4.26	.63
I believe that ICT can help me to be more creative in my skills	<i>Urban</i>	4.24	.63
	<i>Rural</i>	3.36	.58
	<i>Semi-urban</i>	4.16	.60
I believe that I understand my course work better if I use ICT	<i>Urban</i>	4.62	.52
	<i>Rural</i>	3.31	.52
	<i>Semi-urban</i>	4.17	.62
I believe that using ICT makes me interested in learning	<i>Urban</i>	4.63	.57
	<i>Rural</i>	3.40	.63
	<i>Semi-urban</i>	4.19	.61

i. ***Differences in readiness to use ICT in regards to students' home of origin.***

The overall mean score for readiness to use ICT was low, however statistical differences revealed that there were also differences in responses depending on the location from where students came from. The responses in table 7 below indicate that students in the urban sector gave more positive responses towards readiness to use ICT with an overall mean of 3.34. Students in the semi-urban courses ranked second with an overall mean of 2.15. Students in the rural sector gave the lowest score with an overall

mean of 1.71. One-way analyses of variance were also conducted and it was discovered that the following statements had statistical differences: If it becomes available, I would like to use digital technologies in my education ($F=300.39$), $p < .05$; I feel confident that I can use digital technologies in my education ($F=260.22$), $p < .05$; I will continue using digital technology in learning ($F=56.49$), $p < .05$. Table 7 below shows mean scores of students' readiness to use ICT based on students' home of origin.

Table 8: Mean scores of students' readiness to use ICT based on students' home of origin.

Statement	Course	Mean	SD
If it becomes available, I would like to use digital technologies in my education	<i>Urban</i>	4.64	.48
	<i>Rural</i>	2.12	.70
	<i>Semi-urban</i>	2.98	.75
I can fix problems created by digital technology	<i>Urban</i>	1.31	.47
	<i>Rural</i>	1.24	.43
	<i>Semi-urban</i>	1.29	.46
I feel confident that I can use digital technologies in my education	<i>Urban</i>	4.42	.68
	<i>Rural</i>	1.82	.71
	<i>Semi-urban</i>	2.17	.91
I will continue using digital technology in learning	<i>Urban</i>	2.97	.85
	<i>Rural</i>	1.65	.72
	<i>Semi-urban</i>	2.19	.83

Discussion

The findings revealed by this study indicate that firstly, students use ICT mostly for communication. This is similar to findings by other researchers such as Charles & Issifu, (2015); Siddiquah & Salim, (2017); Umar & Jalil, (2012) who agree that using ICT for communicating is not a pedagogical purpose.

Secondly, the study showed that there were positive responses in beliefs and readiness to use ICT. The findings however showed that although there were no statistical differences in the responses between male and female students, male students showed more positive responses in beliefs of using ICT than female students. On the other hand, female students showed more readiness in using ICT than men. Thirdly, the findings reveal that there were statistical differences in beliefs and readiness to use ICT among the students from urban, semi-urban and rural areas. These findings are in line with (Asfar & Zainuddin, 2015; Woreta et al., 2013) whose studies revealed big gaps in ICT proficiency between students in urban and rural areas.

Conclusion

The significance of adopting ICT in all sectors of development including education could not be overlooked. Adopting ICT in vocational colleges proves to be a driving force of the economy in general. However, many developing countries like Malawi still lag behind in promoting this development due to many reasons including having limited resources since many ICT resources are expensive to acquire and maintain. However, this study recommends that authorities in education sector must strive to develop ICT in order to have a positive academic impact on the students as many students have indicated that they usually use the ICT resources for social than academic purposes. However, with recent changes due to the effects of pandemics like COVID-19 it is clear that in the near future, students will be forced to engage themselves in ICT learning platforms as they will have no any other options. As such it is recommended that the significance of ICT should be civic educated especially to the students who play a major role in driving the economies of their countries.

Limitations of the study

Just like any other unfunded study, this study encountered some limitations such as the unwillingness of respondents to fill in the questionnaire since there were no tokens of appreciation to act as a motivation for them, rendering it to be voluntary. However, the researchers overcame this limitation by encouraging the students that this study will be of high help to them as it will motivate the authorities to change some policies according to the advice that would be gotten after the report is compiled.

Declarations

Competing interest

The authors declare that there is no competing interest

Statement of availability of data and materials

All the data materials are provided if anything is needed will be provided upon request from the authors.

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Authors Contributions

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