INFORMATION AND COMMUNICATION TECHNOLOGY(ICT) ON STUDENTS' LEARNING IN GHANA. THE CASE OF CENTRAL UNIVERSITY, KUMASI CAMPUS.

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ABSTRACT

Impacting knowledge, learning and teaching are seeing a lot of evolutions in modern times. Today, the methods of acquiring knowledge are rapidly expanding, and modern societies need to look seriously at effects of Information and Communication Technology (ICT) on teaching and learning.

The purpose of the study was to assess the effects of information and communication technology on students' learning. The study used the theory of cognitive elasticity (Spiro & Jehng, 1992), which was emphasized at four levels of assessment Kirkpatrick (Kirkpatrick, 1994). A quantitative method was used, and questionnaire was the main source of data collection. The summary of the findings of this study was prearranged based on the research objectives of this study. A sample of one hundred and fifty (150) respondents from Central University Kumasi campus formed the total number of respondents for this study, of which (60%) of the respondents were males and 40% are females.   The study revealed that, students have a positive perception on the use of ICT to enhance academic learning with a mean score a mean 4.59 which indicated the rank strongly agree to the perception statement. The perception index was 4.14 which showed that respondents interviewed at Central University generally agree to the perception statements.

The empirical results on factors that influence the use of ICT at Central University campus showed that variables "Inadequate infrastructure" and "Inadequate teaching personnel" were statistically significant at 10% and 1% respectively with a constant which was statistically significant at 1%.

In addition, the results on challenges confronting the use of ICT in Central University indicated that, Kendall's WA was 0.524 meaning there is 52.4% agreement among the rankers of the challenges facing the use of ICT. The challenged statement "Lack of ICT infrastructure" was ranked first by the respondents interviewed in the survey with a mean score of 4.83. "Inadequate teaching personal" was ranked least with a mean score of 2.64. The study recommends that, development policies and program interventions designed to improve the use of ICT by students must consider the variables used in this study that were statistically significant that is inadequate infrastructure and inadequate teaching personal.

Secondly, the university should invest heavily to provide an adequate number of computers and also enhance internet connection in the university to ensure easy access to teaching-learning materials on the web.

KEYWORDS: ICT, Teaching, Learning, Students, Central University, Ghana.

LITERATURE REVIEW

Theoretical Review

The study is based on the concept of dissolving intelligence (spiral et al., 1992) Kirkpatrick's step-step assessment (Kirkpatrick, 1994). Kirkpatrick emphasis reaction, transfer, learning and results. It attempts to answer questions regarding the participants' perceptions - did they like it?, was the material relevant to their work?

In addition, the participants' reactions have vital consequences for learning (level two), although a good reaction does not guarantee to learn; a bad reaction almost certainly reduces its possibility (Winfrey, 1999).

Two sets of ideas stimulate students to be content with their age which controls students and is used to identify their skills, knowledge and their quantity, the learning goes on and on.

 Part 3 – Transferring; they see the transfer at this stage, the program affects student behavior. Try to study at this stage; the answer is that you are ready to use new skills, new information or new relationships. The creation of the idea the students' needs daily is the additional supplemental refinements and changes to the

important information they need. The ideas are especially relevant to the first-time student to get the idea of knowledge and technology by learning of electrical drives and can explain the needs and the explanations of skilled students. (Noah and Schmitt, 1986, Amnill and McLean, (2001).

Student change their ways and desire to learn and use new skills and knowledge to do business, and the three types are; movers, drivers and trucks which they used to learn and to accomplish their goal. You can have information or skills in a new place. This is important for teachers by using modern technology and communication messages to teach a series of similarities, benefits and learning with literacy skills and knowledge.

You can use additional information from data or other data sources. (Allessi and Trollip, 2001). Long-term teachers should learn ICT. Students are taught to adopt the change of circumstances or places. Once you can learn skills and knowledge and make informed changes in education condition. This is in line with the strong development of science and communication messages today. It is important to note that the level of information provided is based on all students. They want to use their information in their workplace, but it's students know that they can use their skills to achieve their expectations on the field. The results of the fourth grade seem to be small and this trend is considered one leader and messengers can understand how they can live, strengthening behavior, high risks, enrollment, and cost savings restore the money.

This is one of the reasons why Holton made a mistake in 1996 (Amnill and McLean, 2001).

Sometimes learning is not only beneficial for valuable learning. In other words, you can get the information, however, project designers are not able to teach you and cannot learn to apply cultural or information. Exercise can be the same; this greatly affects the planning process.
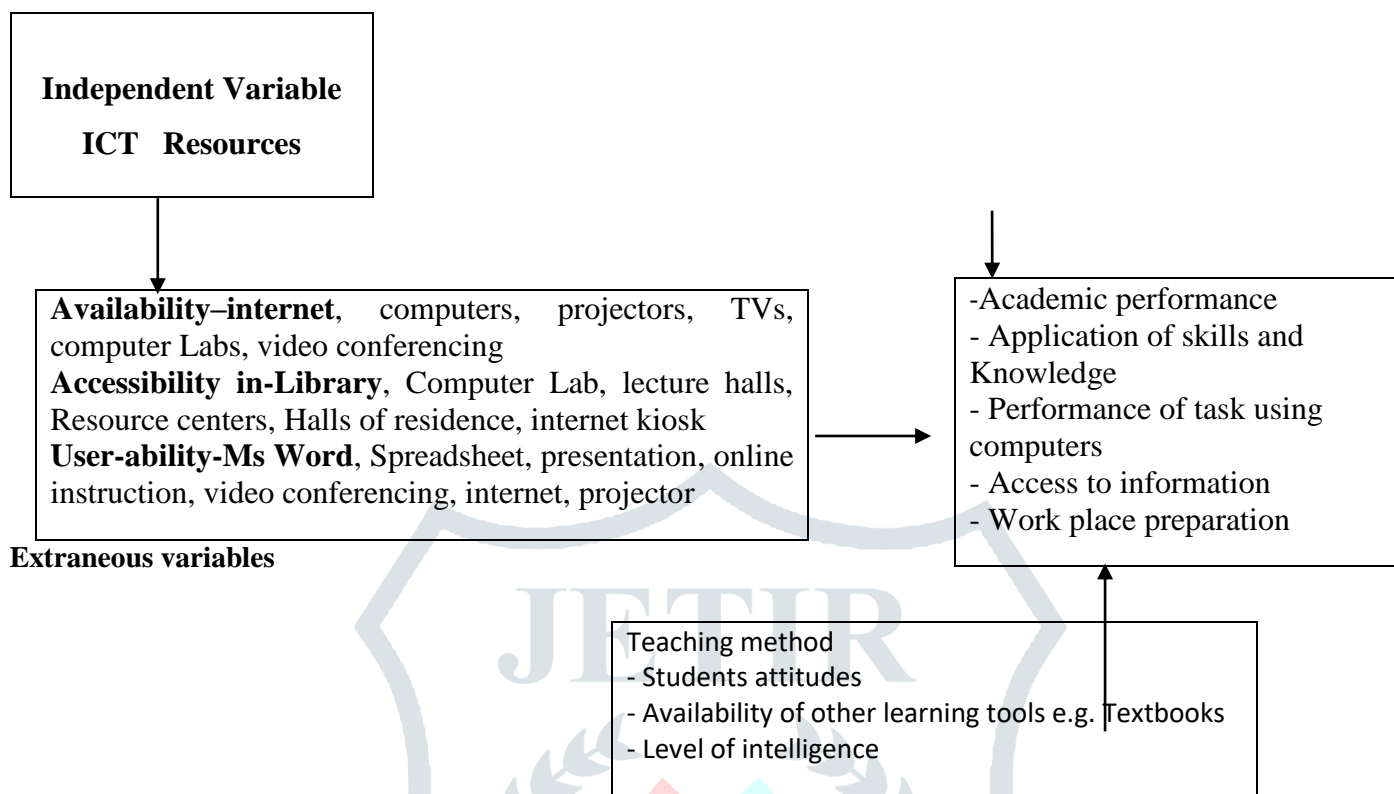
Conceptual framework

Fig 1: Conceptual framework showing relationship between ICT and learning Source: Adapted from Spiro et al., 1992

The presence and use of the ICT resources by the students and lecturers provide an avenue of Interaction. This interaction provides feedback, which enhances the learning environment application of multimedia applications such as sports, tests, animation and other technological applications provides such method, questions and answers. The student looks at the subject in a timely manner, which generates more interest. Books have been in touch with their education and have given them, there is a desire to try and apply the knowledge found in different locations.

User-ability of ICT resources and student's learning

Teaching is one of the most important functions in our field, grow fast and most of them are also in the hands of students and teachers. Success in modern technology has brought new opportunities but also allows many users and teachers to use them he is a new expert in teaching and learning (Jung, 2005).

As a result, global education is not spilling technology and media (Rector) in a recent study by the British Council of ICT to integrate the five pillars of the emphasis on the user's ability to source IT (Severe

Curriculum Schools in the UK with National, 2004) and development Professional ICT has improved God's own life in all books, no one owns it Research and Student 2000, Research (Cicero). To help students use ICT Vice-cultural knowledge of tax revenues. It's my nature business plans to share experiences with others to solve problems. I will not be alive, learning and (UNESCO, 2002) been taught exciting new opportunities.

The talents of students and teachers, (Bitten and Beater, 2002) teachers and students together are the evolutionary development, they can start looking for a technological education they know the path, and the use of others. It has the power that can be used properly technology, education, teachers and students can participate; Changes the knowledge of the traditional culture of students and teacher's knowledge and ability to overcome confusion in major changes and now.

New Housing (2002) and Good (2002) remember that icons are best to learn phase details and products indicate that learning environment and curriculum are also mathematics and equipment are in the heart of ITC. However, teachers and students they should rely on this topic and the ability to read basic information about ICT Integrating ICT in education. There are many searches it learns that students are often encouraged to learn and learn when using ITT personal research support.

Students do the computer skills to remember these things information technology and their functions. Believe if the students remember equipment and applications that facilitate understanding and use. Do not get the file to learn how to achieve different types of course; always use a storage plan and when you do not work.

There are no other plans small systems do not work (Jonassen, 2000) more than a disaster. But it is not very proud of the information technology, low expectations and a portion of the teacher, which reduces student expectations and general education system.

Research Design

This study used the cross-sectional structure in research. Cutting design is allowed population screening at a certain moment and the difference between individual groups in comparison with the population. It is also the intention to work together between ICT and students studying in the context of Central University, looking for students and teachers.

Again, this study used a quantitative research method. The choice of a quantitative research design for this study was informed by its primary strengths because, according to Creswell (2005) the findings are generalizable, and the data are objective. Creswell (2005) further asserts that quantitative research design is more scientific than a qualitative research design.

Sample Selection

The investigation was conducted at Central University. A total of 150 respondents were selected for this study. The classes and size of the respondents that partook in the study are shown in Table 1 below;

Table1: Sample selection and categories of respondent involved

Categories	Number	Percentage
Students	100	73.3%
Lectures	30	16.67%
Staffs	20	10%
Total	150	100%

Source: Author's construct, 2018

Lectures framed piece of the examination since they are associated with the educating and learning process. The managers were thought about approach implementers and firmly identified with the impact of ICT on learning. The understudies were viewed as the genuine delegate populace since they were the objective of this examination.

Empirical specification of the model

The decision for a student, lecturer or staff to indicate "Yes" or "No" can be explained as a distinct set of variables, concerning choice of models, the most significant aspect of the decision framework was the dichotomous dependent variable (decision Yes or No). According to Greene (2008), linear methods are inappropriate for dichotomous choices since they can lead to heteroscedastic variances. This problem is typically remedied by using maximum likelihood estimation. When heteroscedasticity is observed in likelihood estimation, such models require more general estimation (Wooldridge, 2000). However, such models are not often used, since logit and probit models with elastic functional forms in the independent variables tend to work well, in decision making by a student, lecturer or staff on performance, this is evaluated in terms of its additional performance.

If the benefit is higher, then preference or utility (U) to increase the use of ICT (assuming a monotonic), a monotonic relationship between utility and benefits will be higher than when start-up business performance is less.

According to Greene (2000), random utility models address these types of individual choice situations. A common specification is the linear random utility model. Suppose an individual utility after indicating "Yes" for a given vector of factors (Z) is denoted by U (Z) $_{re}$, and the utility without a performance by *UN (Z) re*.

Then, the preference for indicating "Yes" or "No" can be defined as a linear relationship.

$$Y = \beta_o + \beta_1 Power + \beta_2 Access + \beta_3 Infra + \beta_4 Bure + \beta_5 Personal + \beta_6 \operatorname{int} ernet + e$$

Where;

$$\beta_o, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$$

are coefficients and e is the error term of the equation.

Table 2.0 Variables and their Description

Variables	Description	Type of measure	Apriori /Expected sign
Dependent Variable			
ICT	Use of ICT	Yes = 1 No = 0	
Independent Variable			
Power	Indequate power supply	1 = Yes 0 = No	+
Access	Limited time to access the ICT lab	1 = Yes 0 = No	+
Infra	Inadquate infrastructure	1 = Yes 0 = No	+
Bure	Bureaucracy	1 = Yes 0 = No	+
Personal	Indequate teaching personal	1 = Yes 0 = No	+
Internet	Indequate internet services	1 = Yes 0 = No	+

Source: Author's construct, 2018

ANALYSIS AND INTERPRETATION OF RESULTS

Perception of students on ICT at University College.

Table 3:0 presents results on perception of students on the use of ICT in Central University College.

Table 3.0 Perception of students on the use of ICT

Perception Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean score
Increase academic performance			8 (5.3)	45 (30.0)	97 (64.7)	4.59
Helps students in their research work	2 (1.3)	6 (4.0)	3 (2.0)	71 (47.3)	68 (45.3)	4.31
Increase communication speed between lecturers and students		14 (9.3)	12 (8.0)	55 (36.7)	69 (46.0)	4.19
Improves students' learning	11 (7.3)	6 (4.0)	15 (10.0)	35 (23.3)	83 (55.3)	4.15
Increase instructional materials	9 (6.0)	8 (5.3)	21 (14.0)	58 (38.7)	54 (36.0)	3.93
ICT improves presentation in class	8 (5.3)	14 (9.3)	9.3 (13.3)	48 (32.0)	60 (40.0)	3.92
Promote students' group work and collaboration		11 (7.3)	37 (24.7)	59 (39.3)	43 (28.7)	3.89
Perception Index						**4.14**

Source: Computed from survey data, 2018

Table 3.0 shows results on the perception of students on ICT use at the Central University campus. The perception statement "Increase academic performance" had the highest mean score with a mean 4.59 which correspond with the rank strongly agree, which indicate that respondents' interviewed in the survey have a strong perception that the use of ICT on Central University campus increase academic performance of students. Also, the perception statements "Helps students in their research work", "Increase communication speed between lecturers and students", "Improves students' learning" and "Increase instructional materials" have mean scores 4.31, 4.19, 4.15 and 3.93 respectively.

The results from table 3.0 above further indicate perception statement "ICT improves presentation in class", "Promote students' group work and collaboration" and "Promote students' group work and collaboration" with mean scores 3.93, 3.92 and 3.89 respectively.

The perception index from the results from table 3.0 above indicate 4.14 which shows that respondents interviewed at Central University generally agree to the perception statements on the use of ICT and that perception plays a substantial role in students' ICT integration into learning.

Factors that influence the use of ICT at Central University

Table 4.0 Linear regression estimation of factors influence ICT use

Independent variable	Coefficient	Standard Error	t	P>|z|
Inadequate power supply	0.0566	0.1100	0.51	0.609
Limited time to access the ICT lab	-0.3065	0.2643	-1.16	0.251
Inadequate infrastructure	0.3336	0.1963	-1.70	0.095*
Inadequate teaching personal	0.3649	0.1238	2.95	0.005***
Bureaucracy	0.1747	0.1222	1.43	0.159
Constant	0.7653	0.1242	6.16	0.000***
Number of obs	150			
Prob > F	0.0034			
R-squared	0.2989			
Adj R-squared	0.2195			

Source: Computed from survey data, 2018 *, ** and * denotes 10%, 5% and 1% significance levels respectively**

Table 4.0 above presents results on the linear regression estimation of factors that influence ICT use. It can be seen from Table 4.0 above that the adjusted R^2 is 0.2195 which means that about 21.95% of the variation in the dependent variable (ICT use) is jointly explained by the explanatory variables, with a constant value which is positive and statistically significant at 1%.

Table 4.0 above indicates that variables such as inadequate infrastructure and Inadequate teaching personal were statistically significant.

The variable "Inadequate infrastructure" was positive and statistically influences ICT use at 10%. That is inadequate ICT infrastructure at Central University campus influence students' use of ICT at the University at a 10% significant level.

The results from table 4.0 above further indicate that, the variable "Inadequate teaching personal" was also positive and statically significant 1%.

Challenges affecting students' accessibility of ICT resources

The respondents were asked to give their views on the challenges affecting students in accessing ICT use.

Table 5.0 Challenges faced by start-up businesses

Challenges	Mean Score	Rank
Lack of ICT infrastructure	4.83	1st
Poor management	4.69	2nd
Limited time to access the ICT facility	4.22	3rd
Unreliable Internet	4.17	4th
Insufficient or irregular power supply	3.97	5th
Unavailability of appropriate software	3.48	6th
Inadequate teaching personnel	2.64	7th
Diagnostics Statistics		
Number of observation	150	
Kendall's Wa	0.524	
Chi-Square	145.784	
Df	6	
Asymp. Sig	0.000	

Source: Computed from Field survey, 2018

The result from table 5.0 shows the challenges confronting ICT use by students in Central University. Kendall's W^A was 0.524 meaning there is 52.4% agreement among the rankers of the challenges facing ICT use. The chi-square (X^2) calculated from the simulation was 145.784. The result was supported by the probability value of 0.000 which less than 1% $(P<0.01)$ significant levels. The statements "Lack of ICT infrastructure", "Poor management" and "Limited time to access the ICT facility" were ranked first, second and third by the respondents interviewed in the survey with mean scores 4.83, 4.69 and 4.22 respectively. Also, "Unreliable Internet", "Insufficient or irregular power supply", "Unavailability of appropriate software" and "Inadequate teaching personnel" were ranked fourth, fifth, sixth and seventh with mean scores 4.17, 3.97, 3.48 and 2.64 respectively.

Summary of Findings

The purpose of the study was to assess the effects of information and communication technology on students' learning. The summary of the findings of this study was prearranged based on the research objectives of this study. A sample of one hundred and fifty (150) respondents from Central University Kumasi campus formed the total number of respondents for this study, of which (60%) of the respondents are males and 40% are

females. This indicates that the majority of the respondents are males. 27% of the respondents are between the ages 26 to 30 years, 33% between the years 21 to 25 years, 20% are less than 21 years and above 30 years. The results further indicate that 35% of the respondents interviewed indicated that they are second-year students, 20% indicated the first year, 17% indicated fourth and fifth and also 12% indicated third. Also, Majority (55%) of the respondents are from the School of Business as their faculty, 35% from the School of Theology and Missions and 11% from Faculty of law.

On perception of students on the use of ICT, the perception statement "Increase academic performance" had a mean score a mean 4.59 which indicated the rank strongly agree to the perception statement. The perception index was 4.14 which showed that respondents interviewed at Central University generally agree to the perception statements.

The empirical results on factors that influence the use of ICT at Central University campus showed that variables "Inadequate infrastructure" and "Inadequate teaching personnel" were statistically significant at 10% and 1% respectively with a constant which was statistically significant at 1%.

In addition, the results on challenges confronting the use of ICT in Central University indicated that, Kendall's WA was 0.524 meaning there is 52.4% agreement among the rankers of the challenges facing the use of ICT. The challenged statement "Lack of ICT infrastructure" was ranked first by the respondents interviewed in the survey with a mean score of 4.83. "Inadequate teaching personal" was ranked least with a mean score of 2.64.

Conclusion

From the findings of this study, it can be concluded that; students' perception of ICT is that ICT use in the university increase academic performance and helps students in their research work.

Also, inadequate infrastructure and inadequate teaching personnel are all significant factors influence that influences students' use of ICT at Central University campus. Also, it came to light that lack of ICT infrastructure, poor management and limited time to access the ICT facility are three most important challenges confronting ICT use by students at Central University campus.

Policy Recommendations

From the analysis, findings and conclusions in this study, the following recommendations can be made for the policy makers. Firstly, Development policies and program interventions designed to improve the use of ICT by students must consider the variables used in this study that were statistically significant that is inadequate infrastructure and inadequate teaching personal.

Secondly, the university should invest heavily to provide an adequate number of computers and enhance internet connection in the university to ensure easy access to teaching-learning materials on the web.

Also, the university should develop pre-service and in-service staff training programmes that are tailored to the school programmes to keep ICT training tutors up to date with the technological changes which will promote proper integration of ICTs in teaching and learning in the university. More training tutors and computer technicians should be deployed to the various faculties in the university to train the students on the use of computers to increase the confidence when learning using ICTs.

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