

The Impact of ICT in Enhancing the Academic Competency among College Students in Ongkarak District, Thailand

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Abstract

The role of Information Communication and Technology (ICT) is the key nowadays in almost every arena of our competitive life of 21st century. Throughout the globe, it has set the opportunities for the sustainable growth and fast development. This paper analyses the impact of Information Communication and Technology (ICT) in enhancing the academic competency among college students. Now in 21st century all education system across the globe has changed due to Information Communication and Technology (ICT). The aims of this paper are two-fold: first to determine the impact of ICT on higher education which is not only in student performance but also in enhancing their academic competency and second purpose is to provide solutions if any negatively impact occurred. With this research it has been found that the ICT could be of a great strength in maintaining a very high competitive competency among teachers, knowledge facilitators and the students. Proper guidance and application of ICT tools will make the cost of implementation on ICT and its infrastructure more economical, in terms of the benefits which could be taken out of this. Results show that the correct alignment together between the implementation and application of ICT tools adds up with an added advantage in terms of application, knowledge and experience among the students towards their increased competency. It is found that the ICT learning achievement of the students is affected when the teaching and learning processes are enhanced by Information Communication and Technology (ICT). It motivates the students to become more involved, active and interested in learning. In addition, ICT with its implementation, practice and usage makes the value-added graduates with increased competency, compatibility and multi-tasking skills.

Keywords: Information Communication and Technology (ICT); students' performance; academic competency; higher education.

1. INTRODUCTION

Educational system of Thailand is largely a government responsibility provided through the ministry of education. Thailand's constitution guarantees its citizens twelve years of free education. The Thai education system comprises 4 levels, namely pre-school education, primary education, secondary education, and higher education. Previously, education in Thailand was provided by Buddhist monks and was only boys available but nowadays is providing by teachers instead.

Source: *OECD/UNESCO (2016), Education in Thailand: An OECD-UNESCO Perspective, Reviews of National Policies for Education, OECD Publishing, Paris*

The impact of ICT on learning can be approached in different ways. In this paper has shown the impact of ICT on higher education in enhancing their academic competency. However, ICT is not only impact on learning outcomes but also the teaching method of teachers. When the term ICT is used in this paper, it should be understood within a higher education organization. Consequently, ICT for learning and teaching are including both formal and non-formal. The objectives of the proposed study are namely, to identify the impact of ICT on college students in enhancing academic competency, to determine the efficiency and effectiveness of ICT in academic competency, to estimate ICT has enhanced the students competency, and to collect satisfaction of college students about the ICT.

2. LITERATURE REVIEW

2.1 ICT and students' performance

(Tikam, 2013) has done his research on ICT and the finding shows the impact of ICT includes affecting all aspect of education, improving the effectiveness of education, helping literacy movements, enhancing scope of education. (Hui-Yin Hsu, Shiang-Kwei Wang, 2011) Wang's research study indicates that using digital texts and blogs correlated positively with higher retention rate. (Adel Ben Youssef, Mounir Dahmani, 2008) Adel Ben Youssef and Mounir Dahmani's research examined the relationship between the use of information and communication technologies (ICT) and student performance in higher education.

2.2 Teachers' characteristics

(Jo Tondeur, Johan van Braak and Martin Valcke, 2007) Jo Tondeur's research concludes that the potential value of a school-based ICT curriculum that translates the national ICT related curriculum into an ICT plan is part of the overall school policy. (Steve Kennewell and Gary Beauchamp, 2007) Steve Kennewell's study of Information and Communication Technology (ICT) rich primary school, interactive whiteboards (IWBs) were found to be the predominant ICT tools used by teachers. (Gill Kirkup and Adrian Kirkwood, 2005) Gill Kirkup and Adrian Kirkwood's study investigates how HE teachers in one large distance learning university have, over time.

2.3 Digital innovation

(Ashraf, 2015) A Development Impact Assessment on the Use of ICT (Mobile Phone) in Rural Areas if Bangladesh is done by Mahfuz Ashraf in 2015. The field data reflected that how information diffusion improve and resolve the rural

communities' agricultural queries and problems to enhance their livelihood. (Farid Shirazi, Ojelanki Ngwenyama, Olga Morawczynski, 2010) Farid Shirazi, Ojelanki Ngwenyama, Olga Morawczynski analyze archival data on 133 countries from 1995 to 2003 for "ICT expansion and the digital divide in democratic freedoms". (Watson, 2006) "Understanding the relationship between ICT and education means exporing innovation and change" has done by Watson in 2006.

2.4 Learning Outcomes & Lack of ICT Utilisation

(Aristovnik, 2012) Aleksander Aristovnik analysed, "The impact of ICT on educational performance and its efficiency in selected EU and OECD countries: a non-parametric analysis" in 2012. (Fadhili. M. Ngalawa, Peter Elia Mosha and Peter Josephat, 2012) in the paper "The use of ICT tools in higher learning institutions in Tanzania" reveals that there are several factors that favor ICT tools utilization such as inadequate books in the Library, adaptability, availability of technical support to mention few.

2.5 Conceptual Model / Research Framework

Based on the literature review the following model is framed:-

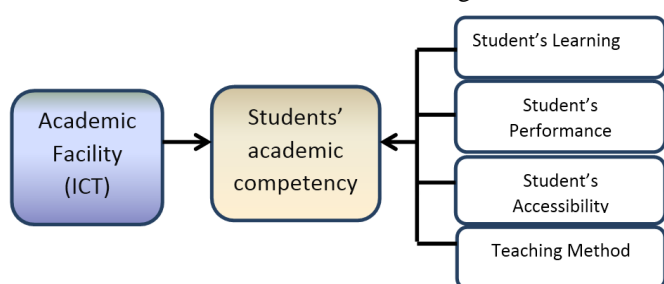


Fig.1. Conceptual ICT Model / Research framework

2.6 Research Design

This research involved quantitative and qualitative methods of data collection of the year 4th and year 3rd students. Population of this study is the students of Faculty of Business Administration of the college located in Ongkarak district, Nakhonnayok in Thailand.

Initially, a pilot study of 30 respondents was done for scale refinement and for estimating the standard deviation score, for the exact population size of 532 students.

By extracting the standard deviation score of 0.741 of 26 impact of ICT on college students extracted through the pilot study result of the impact of ICT, since the population is 532, the researcher has taken 48 percentage of the population size as an acceptable representation, i. e., 48 % of 532; we get a sample size of 255.

The survey instrument was developed by reviewing the various literatures all about the impact of ICT on college students and previous questionnaires related to various dimensions were validated and refined with the help of pilot study data.

Instrument - Questionnaire used as a survey instrument

Scale used - Sec 1 – Demographic Profile (Nominal Scale)
 Sec 2 – ICT Dimensions (Likert's 5 Point Scale)

2.7 Statistical Tools & data analysis

The internal consistency of the instrument was assessed by Cronbach's alpha. After obtaining the appropriate level of content validity and required level of reliability the final instrument was developed.

Table 1: Reliability Statistics

	Cronbach's Alpha	N of Items
Overall	0.812	26

Sl. No.	Dimension	Cronbach's Alpha
1	Learning via ICT has promoted student's knowledge.	0.836
2	Through learning ICT has improved student's skills and abilities.	0.847
3	ICT helps students understand their lesson better and faster (i.e. online quiz)	0.832
4	ICT can encourage critical thinking.	0.827
5	ICT has motivated students to commit to learn and to participate in learning activities.	0.865
6	Students find their efficiency increased due to ICT.	0.841
7	Students use ICT tools to express their idea and have collaborative learning.	0.747
8	ICT improves poor handwriting and languages skills through word processing.	0.787
9	ICT encourages use of peer coaching and peer reviews.	0.788
10	Students independently solve a problem with the knowledge they achieved in the class using ICT.	0.841
11	ICT has improved students quality of work and has given them the confidence to perform enhanced learning tasks.	0.824
12	ICT is attractive and pulls attention of students.	0.736

Sl. No.	Dimension	Cronbach's Alpha
13	ICT is important today to develop corporate competency.	0.917
14	ICT creates new resources of knowledge both within and outside classroom.	0.802
15	ICT tools (i.e. E-Learning) helps students to search independently for information at anywhere and anytime across the globe.	0.825
16	Students can select and compare quality & price and save time because no need to go to the school or definite teaching premises.	0.765
17	Students can select learning products and learning (Institutions) service from anywhere around the world.	0.841
18	Students know how to take advantages from ICT tools to facilitate education.	0.747
19	Students will get the advantage of learning information for their decision making in anyway (i.e. course information, teacher online discussion forums, weblog, online teaching tools etc.)	0.737
20	Students have been updated about the academic activities through ICT (college or university website or weblog) well in advance.	0.838
21	ICT increased information reliability and accuracy adding to authenticity of learning tasks, with realistic and up-to-date information.	0.741
22	Students can easily access to knowledge through using ICT (Internet, social network, electronic library etc.)	0.824
23	ICT has no complicated system. It is a process of easy accessibility.	0.738
24	ICT changes teachers' practices, planning tools and assessment rubrics.	0.841
25	Teachers are using ICT tools to provide efficient and effective facilitation of learning.	0.824
26	Teacher has integrated students' participation and motivational learning through the application of ICT.	0.901

The above table depicts the alpha coefficient for the twenty six items are 0.812, suggesting that the items have relatively high internal consistency.

By the above data, primary data was conducted from the sample size through questionnaire and taken secondary data mostly from related journals, textbooks and websites. In this study, Chi-Square, One-Way ANOVA, Factor Analysis and Multiple Regression Analysis are used in this paper as a statistic tools in order to interpret all data.

3. DATA INTERPRETATION AND ANALYSIS

3.1 Chi - Square Analysis

3.1.1 Social network site vs. ICT creates new resources of knowledge both within and outside classroom

H₀: There is no significant relationship between social network site of the respondents that using and ICT creates new resources of knowledge both within and outside classroom.

H₁: There is significant relationship between social network site of the respondents that using and ICT creates new resources of knowledge both within and outside classroom.

Table 2: Chi – square tests Social network site vs. ICT creates new resources of knowledge both within and outside classroom

	Value	Degree of freedom (df)	Asymp. Sig. (2-sided)
Pearson Chi-Square	74.000	24	0.000
Likelihood Ratio	38.782	24	0.029
Linear-by-Linear Association	4.510	1	0.034
N of Valid Cases	255		

a. 29 cells (82.9%) have expected count less than 5. The minimum expected count is .02.

The two variables include social network site of the respondents that using and ICT creates new resources of knowledge both within and outside classroom have a strong relationship that observed from the table 2. In Pearson Chi-square value, we have a low significance value of 0.000 (typically below 0.05).

3.2 One-Way ANOVA Analysis

3.2.1 Faculty vs. ICT helps students to search independently for information

H₀: There is no significant difference between faculties of the respondents with ICT tools (i.e. E-Learning) helps

students to search independently for information at anywhere and anytime across the globe.

H₁: There is significant difference between faculties of the respondents with ICT tools (i.e. E-Learning) helps students to search independently for information at anywhere and anytime across the globe.

Table 3: Faculty vs. ICT helps students to search information independently (ANOVA)

	Sum of Squares	Degree of freedom (df)	Mean Square	F	Sig.
Between Groups	19.069	11	1.734	2.936	0.001
Within Groups	143.456	243	0.590		
Total	162.525	254			

There is a significant difference between faculties of the respondents with ICT tools (i.e. e-Learning) helps students to search independently for information at anywhere and anytime across the globe because of the above table shows the significant level of 0.001. Thus, the alternative hypothesis is accepted but null hypothesis is rejected.

3.3 Multiple Regression Analysis

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.657	0.431	0.366	0.595

The above table displays are R, R², adjusted R² and standard error

R (0.657) refers to the multiple correlation coefficient i.e. it is the correlation between the observed and predicted values of the dependent variable. R² (0.431) is the proportion of variation in the dependent variable explained by the regression model. Adjusted R² (0.366) attempts to correct R² to more closely reflect the goodness of fit of the model in the population.

Table 5: ANOVA

Model		Sum of Squares	Degree of freedom (df)	Mean Square	F	Sig.
1	Regression	61.169	26	2.353	6.648	.000
	Residual	80.690	228	0.354		
	Total	141.859	254			

The output for a total (141.859) is the sum of information for regression (61.169) and residual (80.690). F statistics (6.648) are the regression mean square divided residual mean squared. The significance value of 'F' is (0.000) here, which is less than 0.05, so the independent variable does a good job in explaining the variation in the dependent variable.

Table 6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.099	0.353		0.280	0.780
	Learning via ICT has promoted student's knowledge.	0.036	0.078	0.032	0.466	0.642
	Through learning ICT has improved student's skills and abilities.	0.122	0.078	0.104	1.565	0.119
	ICT helps students understand their lesson better and faster (i.e. online quiz)	0.002	0.063	0.003	0.038	0.970
	ICT can encourage critical thinking.	0.059	0.064	0.062	0.918	0.360
	ICT has motivated students to commit to learn and to participate in learning activities.	0.036	0.062	0.038	0.583	0.560
	Students find their efficiency increased due to ICT.	0.046	0.058	0.051	0.799	0.425
	Students use ICT tools to express their idea and have collaborative learning.	0.036	0.059	0.037	0.607	0.545
	ICT improves poor handwriting and languages skills through word processing.	-0.040	0.049	-0.052	-0.821	0.412
	ICT encourages use of peer coaching and peer reviews.	-0.070	0.057	-0.078	-1.230	0.220
	Students independently solve a problem with the knowledge they achieved in the class using ICT.	0.077	0.057	0.089	1.353	0.177
	ICT has improved students quality of work and has given them the confidence to perform enhanced learning tasks.	0.128	0.059	0.136	2.180	0.030
	ICT is attractive and pulls attention of students.	0.046	0.061	0.050	0.761	0.448
	ICT is important today to develop corporate competency.	0.093	0.063	0.099	1.487	0.138

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	ICT creates new resources of knowledge both within and outside classroom.	-0.072	0.059	-0.081	-1.221	0.223
	ICT tools (i.e. E-Learning) helps students to search independently for information at anywhere and anytime across the globe.	-0.041	0.061	-0.044	-0.672	0.502
	Students can select and compare quality & price and save time because no need to go to the school or definite teaching premises.	0.030	0.059	0.033	0.508	0.612
	Students can select learning products and learning (Institutions) service from anywhere around the world.	-0.032	0.063	-0.034	-0.507	0.613
	Students know how to take advantages from ICT tools to facilitate education.	0.120	0.075	0.121	1.608	0.109
	Students will get the advantage of learning information for their decision making in anyway (i.e. course information, teacher online discussion forums, weblog, online teaching tools etc.)	-0.021	0.061	-0.022	-0.352	0.725
	Students have been updated about the academic activities through ICT (college or university website or weblog) well in advance.	0.172	0.070	0.158	2.465	0.014
	ICT increased information reliability and accuracy adding to authenticity of learning tasks, with realistic and up-to-date information.	0.017	0.065	0.017	0.255	0.799
	Students can easily access to knowledge through using ICT (Internet, social network, electronic library etc.)	0.010	0.057	0.011	0.173	0.863
	ICT has no complicated system. It is a process of easy accessibility.	0.038	0.060	0.039	0.640	0.523
	ICT changes teachers' practices, planning tools and assessment rubrics.	0.055	0.061	0.059	0.905	0.366
	Teachers are using ICT tools to provide efficient and effective facilitation of learning.	-0.018	0.063	-0.019	-0.293	0.770
	Teacher has integrated students' participation and motivational learning through the application of ICT.	0.182	0.063	0.194	2.900	0.004

Multiple R=0. 657, F value =6.648, degree of freedom (df) =26,338, p value<0.01, R square=0. 431

$$\hat{Y} = .099 + (0.036)x_1 + (0.122)x_2 + (0.002)x_3 + (0.059)x_4 + (0.036)x_5 + (0.046)x_6 + (0.036)x_7 + (-0.04)x_8 + (-0.07)x_9 + (0.077)x_{10} + (0.128)x_{11} + (0.046)x_{12} + (0.093)x_{13} + (-0.072)x_{14} + (-0.041)x_{15} + (0.03)x_{16} + (-0.032)x_{17} + (0.12)x_{18} + (-0.021)x_{19} + (0.172)x_{20} + (0.017)x_{21} + (0.01)x_{22} + (0.038)x_{23} + (0.055)x_{24} + (-0.018)x_{25} + (0.182)x_{26}$$

Where \hat{y} is the estimated overall satisfaction of college students in enhancing their academic competency.

3.4 Exploratory Factor Analysis

Table 7: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.905
Bartlett's Test of Sphericity	Approx. Chi-Square	2326.368
	Degree of freedom (df)	325
	Sig.	0.000

Here, the researcher concludes that the data is suitable for factor analysis since Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is 0.905 which is shown in the above table.

4. FINDINGS, RECOMMENDATIONS & CONCLUSION

4.1 Findings

In *Chi-Square Analysis*, it is found that social network site usage of the respondents' impact on ICT creates new resources of knowledge both within and outside classroom.

In *One-Way ANOVA Analysis*, the faculties of the respondents have significant differences with ICT tools (i.e. e-Learning) helps students to search independently for information at anywhere and anytime across the globe, students can easily access to knowledge through using ICT (Internet, social network, electronic library etc.), and the teacher has integrated students' participation and motivational learning through the application of ICT.

Six factors were identified in exploratory factor analysis namely ICT facilities corporate competency, ICT provides effectiveness and efficiency of learning outcome, ICT develops teacher's teaching skill, ICT has improved information and communication up to date and reliable, Various selection of ICT tools, and ICT improve student's knowledge, abilities and skills respectively.

In the regression analysis, the multiple R found to be 0.657 which reveals that there exist a relationship of 65.7 percent between the factors of impact of ICT and the college student's academic competency.

4.2 Recommendations

The results of the current study have established the positive impact of ICT in enhancing students' academic competency and the overall teaching and learning processes. The researcher suggests that special funds be created to revamp the e-learning support centers at the faculty level for students use.

- Government should emphasise on ICT enabled e-learning and the Institutions should improve infrastructural facilities like high-speed internet, smart-classrooms to make ICT functional in universities to improve learning.
- Curriculum designers must take ICT to consideration when designing the syllabus for tertiary institutions.
- Stakeholders must place ICT in a center place of activities in all universities.

4.3 Conclusion

The current study was conducted to investigate the effect of using educational technology on the achievement and performance of students at the Srinakaranwirot University (SWU) Ongkarak Campus and St. Theresa International College (STIC). It has been revealed by the results that the learning achievement of students is affected when the teaching and learning processes are enhanced by Information Communication and Technology (ICT). It motivates the students to become more involved, active and interested in learning. In addition, ICT with its implementation, practice and usage makes the value-added graduates with increased competency, compatibility and multi-tasking skills.

Most of the academic staff and instructors at SWU and STIC are integrating their teaching with ICT tools due to its easy access and availability. The integration with ICT will enable

teachers to build teaching competencies therefore it will impact their teaching effectiveness and performance.

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