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Research paper

ICT learning and its butterfly effects on students' academic performance

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Abstract

In this knowledge driven era, there exist a tight competition among the students. High academy performance is a key factor, which evaluates a person's knowledge and eligibility criteria for higher studies. Teaching method has an impact on student's learning behavior and performance. Introduction of ICT learning has created a massive change in the education sector. This research is focused on the influencing effect of ICT learning among the student community. For which, we are introducing an APM (Academic Performance Management) proposing that ICT learning technique has a greater impact on student performance through developing subject interest among students.

Keywords: *Learning; ICT Learning; Academic Performance; Interest; Memory; Time.*

1. Introduction

Many countries have started implementing ICT models in schools for almost 20 years and a number of researches have been done to understand change evolving ICT technology in a large scale educational setup (Falla, 1992b; Hampel, 1996; Harrison, 2004; Hinostraza, 2002; Konting, 2003; Selwyn, 2001; Warschauer, 2003; Yuen, 2003). The use of ICT has improved the motivation level of teachers and has inspired them to expand their teaching practices (Ilomaki, 2004). Fonseca, Marti, Redondo, Navarro and S'anchz (2014) stated that it was more convenient for the students to be more engaged in the suggested content and also technologically they were highly motivated and also found that technology can be used as beneficiary to academic performance. On one hand it was found that students find it helpful to facilitate their learning experience and to face academic challenges (Beetham and Sharpe, 2013). On the other hand many of them find it difficult to cope up with the technology. According to (Cheng, Lin and She, 2015) the knowledge of the students has increased in a long term as a result of technology improved classroom and also increased the learning results. (Trimmel and Bachmann, 2004) found that students who are exposed to the use of technology in classrooms are found with greater participation, they showcased better learning and improved performance when compared with student who do not use ICT. Regardless of many troubles involved in the execution of ICT tools in schools, researchers concluded that both teachers and students accept ICT teaching techniques as they believe that these techniques if employed effectively can be helpful in elevating standards of both teaching and learning (BECTA,2001; Kington, 2003). ICT models in schools still remain as a questionable and disputable matter considering its learning achievements and its implementation process (Reynolds, 2003).

2. Literature review

Saut CAPUK, Adiyaman University (2014) " ICT integration models into middle and high school curriculum in the USA"- The study shows that in order to develop students with the knowledge and skills that are required for the technologically enhanced society, ICT should be integrated to all subject curriculum in a suitable manner. To build up this, teachers should be provided with skills and knowledge of academic zone. Teaching purely ICT should not be the objective of education, instead ICT should offer ample chances to all students for a better and faster learning.

Adina-Petruta Pavela, Andreas Fruth, Monica-Nicoleta Neacsuc (2014) "ICT and E-Learning – Catalysts for Innovation and Quality in Higher Education"-This study stated that ICT is a game changer in the future progress of higher educational institutions. The ICT importance relies on the availability of information and ease of communication than the technology itself. Even though ICT will not replace the traditional classroom teaching and learning methods, ICT regulations are evidently favorable to higher educational institutions. In the current scenario, incorporation of ICT should become the preference of all educational institutions.

Sogol Talebiana*, Hamid Movahed Mohammadia, Ahmad Rezvanfara (2014) "Information and communication technology (ICT) in higher education: advantages, disadvantages, conveniences and limitations of applying e-learning to agricultural students in Iran"- This study stated that ICT is an emblem of a new phase in education. ICT modifies thinking method, enhances educational patterns and implements new teaching mechanisms. These techniques include features of technology positioned training and recommends new schooling methods in which the students play a greater role and also accentuate individualistic, self-reliant, adjustable and collaborative learning.

3. Hypothesis

We have developed four propositions to understand and predict the influence of ICT among school students. The importance and emphasis of academic performance of students are increasing as days go on. Therefore, we have developed a hypothesis to understand and predict the relation between academic performance and ICT employed in schools.

H1: The provision of ICT in schools has a positive impact on the academic performance of students.

Understanding level of students is also important with regard to their academic performance. So it is also important to know the impact of ICT on the understanding level of students, hence we developed a hypothesis.

H2: The provision of ICT in schools has a positive impact on the student's understanding level.

Whatever learned, we should be capable of applying it whenever required. Memorizing, hence play a major role in the performance. For this purpose, we have come up with a hypothesis to test the ICT influence on the memorizing capability among students.

H3: The provision of ICT in schools has a positive impact on memorizing capability of students.

Student's interest on subject influences them to develop their performance. So it is again important to know the influence of ICT to generate subject interest among students. Hence this hypothesis is developed.

H4: The provision of ICT in schools has a positive impact on the subject interest shown by the students.

4. Research methodology

The study is quantitative in nature. A survey has been conducted to unearth the responses for the hypothesis.

- Population of the study

The population for the study was student community of various educational institutions.

- Sample size

The sample size was limited to 182 students who are writing their 10th grade board exams

- The research instrument

The main instrument used for this research study was questionnaire. A total of 182 questionnaires were distributed among the class 10th students of three educational institutions. The reliability and the validity of the instrument were confirmed.

5. Analysis

Academic performance, students understanding level, time taken to study, memorising ability and subject interest were studied against ICT learning. Correlation analysis is done to understand the relationship between dependent and independent variables. Regression analysis is used to test the hypothesis.

At a significance of 5%, there exist a positive relation between ICT and dependent variables like, academic performance, students understanding level, subject interest and memorising capability of students. Time taken by students to study and the provision of ICT by the school is not related as P = .260 >.05.

Table 1: Correlation between Effective ICT and Dependent Variables

		Academic performance	Students understanding on subjects	Time taken to study	Memorising capability of students	Subject interest
Providing effective ICT	Pearson Correlation	.175*	.241**	.084	.289**	.284**
	Sig. (2-tailed)	.018	.001	.260	.000	.000
	N	182	182	182	182	182

CONCL Correlation is significant at the 0.05 level (2-tailed)

Table.2 shows that there is significant difference between the means and hence this Ho is rejected at P<.05. To test the predictability of the impact of ICT learning regression analysis is done. From table: 2 & 3 it is evident that the statistical model of ICT learning and academic performance is significant at F = 5.661 & P = .018 <.05. ICT learning create a positive impact on academic performance ($p < .05$; $\beta = .175$). Students' understanding level is checked against ICT learning and it is seen that the model is Accepted at F = 11.073; P = .001 < .05 and it positively influence student's understanding level ($p < .05$; $\beta = .241$). Model for memorizing capability of students and ICT learning is significant at F = 16.403; P <.05, and ICT helps students to memorise their subjects at $\beta = .289$; $p < .05$. It is found that ICT can increase the subject interest among student. The model is accepted at F = 15.807; $P < .05$; $\beta = .284$.

Table 2: ANOVA

Predictor	Dependent variable		Sum of Squares	df	Mean Square	F	Sig.
ICT	Academic performance	Regression	281.501	1	281.501	5.661	.018[b]
		Residual	8951.054	180	49.728		
		Total	9232.555	181			
	Students understanding level	Regression	8.088	1	8.088	11.073	.001[b]
		Residual	131.478	180	.730		
		Total	139.566	181			
	Memorising capability	Regression	14.824	1	14.824	16.403	.000[b]
		Residual	162.676	180	.904		
		Total	177.500	181			
	Subject interest	Regression	6.350	1	6.350	15.807	.000[b]
		Residual	72.309	180	.402		
		Total	78.659	181			

Table 3: Regression Coefficients

Dependent variable		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Academic performance	(Constant)	80.544	1.677		48.025	.000
	ICT Provision	1.002	.421	.175	2.379	.018
Student's understanding level	(Constant)	3.220	.203		15.842	.000
	ICT Provision	.170	.051	.241	3.328	.001
Memorizing capability	(Constant)	2.630	.226		11.632	.000
	ICT Provision	.230	.057	.289	4.050	.000
Subject interest	(Constant)	2.990	.151		19.835	.000
	ICT Provision	.150	.038	.284	3.976	.000

6. Conclusion

ICT techniques are very valuable to the foundation of education since it will be the next revelation and game changer in the education system. This study is to analyze ICT and its butterfly effects on student's academic performance. Here it is understood that ICT method increases the subject interest of the students, helps them in memorizing their lessons, increase the understanding level of the students, all this together ultimately leads to a better academic performance. The various features of ICT create a massive impact on students and help them to improve their academic performance.

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