

The Influence of Information Technology on Students' Academic Performances.

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Abstract

This study about influences of information technology on students' academic performances. The study was limited to students of faculty of commerce and management eastern university of Sri Lanka. The sample is limited to 45 management students. This technology factor was dived into three as ownership, usage, skills and students academic performance measured by the GPA of the students. At the end, the result was found that the technology usage directly influence on students' performance than other factors. The recommendation is the university environment should encourage more technology usage in the academic activities and develop the atmosphere with technology accessible.

Key words: *information technology, academic performance, technology ownership, technology usage, and technology skills*

1.Introduction

1.1 Background of the study

We live in an information technological era. In information technological era most of the professions attach with information technology. This opportunity also lead the teaching and learning sector more efficient. The technology makes students' involvement higher. Because the technology provide an opportunity to reduce the time that lead to increase the students' involvement in classroom activities.

Moreover, the industries willing to do things with information technology though they expect to get their workforce with knowledge of information technology. Sri Lanka's new millions goal plan government spending millions of rupees to develop infrastructure of information technology in universities and other learning institutions.

Leaf Group (<http://itstillworks.com>) says the advantage of information technology to students are

Learner Styles

A well-known concept to educators, Neil Fleming's multiple learning styles model suggests that not all students learn the same way. Information technology addresses individual learning preferences with its incorporation of rich multimedia. With just a few clicks instructors have instant access to thousands of articles, images, audio, and video that enhance their presentations and engage students. For instance, if a student has difficulty picturing a "yurt" -- the portable dwelling of nomadic Mongols -- a quick Web search yields informative articles, professional photographs, 3-D models, and videos about how yurts are made, along with an interactive map showing where the structures are found. Technology supports various approaches to visual learning, auditory learning, reading, and writing through its interactive, kinesthetic nature.

Classroom Management and Interaction

Information technology benefits the management of classrooms by its ability to create and organize in a virtual space. Many schools have adopted Learning Management Systems (LMS) that centralize aspects of courses in such a

virtual space. Teachers can post documents, eBooks, media, and quizzes that are automatically graded. Assignments can be posted and submitted online and grades can be viewed in a single virtual space. Students can access the LMS anytime and never have to worry about losing a paper or carrying a textbook. LMS also facilitates communication, interaction, and collaboration between students and teachers, providing opportunities to send messages, chat, create wikis, compose documents, blog, and share information much like social media sites.

Accessibility and Wider Participation

The emergence of online classes opens doors to many students who could not otherwise participate in educational settings due to time and financial limitations. Working adults, parents taking care of children, and students being homeschooled can earn diplomas and degrees while on the road or from their homes. Online courses offer non-traditional students the chance to go back to school and improve their lives according to their own schedule and at a lower cost than brick-and-mortar institutions. Free education services are sponsored by educational powerhouses. In an effort to share its resources with the

world, the Massachusetts Institute of Technology developed OPENCOURSEWARE (Link in Resources) that gives the public access to many of the school's courses. Information technology makes it possible for anyone with a desire to learn to pursue an education.

Information Technology and Assessment

As educational institutions move away from traditional grading and towards the assessment of specific skills, information technology redefines how to judge whether students have reached their objectives. For instance, by looking at broader collections of student work compiled in student ePortfolios, institutions are able to monitor how students develop over time and whether they have achieved their goals. The assessment of such skills as writing are enhanced by the use of online software programs such as WriteToLearn that compares semantics among large samples of student work and provides specific feedback on items such as content, redundancy, and irrelevancy. Information technology provides more complete assessment of a student's' academic competence and offers feedback focused on the individual.

The technology has plenty of advantages but no study discussed about the relationship between involvement and technology. Hence our study going to discuss about the relationship between technology and involvement.

1.2 Research Problem

Why don't teachers innovate when they are given computers? (YONG ZHAO, KEVIN PUGH, STEPHEN SHELDON and JOE L. BYERS, Conditions for Classroom Technology Innovations). This is the question arise when we think about the classroom technology and the students' involvement.

The Easter University of Sri Lanka is partially developed in Information Technology towards the faculty of commerce and management. Which is leads to a question, if technologies involvement is high in academic activities the students' involvement will be increased or not? Hence we are going to test students' involvement with development of technologies.

1.3 Research Questions

1. What extent technology ownership influence students' academic performance?
2. What extent technology usage influence on students' academic performance?
3. What extent technology skills influence students' academic performance?

1.4 Objective of the Study

We need to evaluate the classroom fundamental factors among the students. Those are follow;

1. To measure technology ownership toward students' academic performance?
2. To measure technology usage toward students' academic performance?
3. To measure technology skills toward students' academic performance?

2. Literature review

2.1 Information Technology and students.

Tech Target website says that Information technology (IT) is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure

and exchange all forms of electronic data. Though the students use the computer, store the data, networking with others via computer or other mobile phone.

IT software and hardware

IT includes several layers of physical equipment (hardware), virtualization and management or automation tools, operating systems and applications (software) used to perform essential functions. User devices, peripherals and software, such as laptops, smartphones or even recording equipment, can be included in the IT domain. IT can also refer to the architectures, methodologies and regulations governing the use and storage of data.

IT education and job functions

A team of administrators and other technical staffers deploy and manage the company's IT infrastructure and assets. IT teams depend on a wide range of specialized information and technology skills and knowledge to support equipment, applications and activities. Third-party contractors and IT vendor support personnel augment the IT team. (<http://searchdatacenter.techtarget.com/definition/IT>)

2.1.1 Technology ownership

Sri Lankan leading newspaper says, the technology ownership is concern about the laptops and Smart phones. In Sri Lanka there is trend towards the adults laptop ownership has declined compare to Smart phone ownership. The Daily Mirror says that Ownership of desktops and laptops in Sri Lanka has fallen significantly in the first half of 2016 (1H16) compared to the same period in 2015 due to increased use of smartphones and tablets.

According to the data released by the Census and Statistics Department, the number of households that own a laptop or a desktop fell to 22.5 percent in 1H16 from 24.4 percent year-on-year (YoY). The ownership of a desktop fell to 13.1 percent in 1H16 from 15.3 percent YoY.

Hence this will be lead to identify ownership and access a main factor to evaluate the information technology.

2.1.2 Technology use

According to Brain (Tech Participation, 2009) Technology integration is defined as the use of technology to enhance and support the educational environment. Technology integration in the classroom can also support classroom instruction by creating opportunities for students to complete assignments on the computer

rather than the normal pencil and paper. Technology integration in class would help students to explore more. Mostly the university students use the PowerPoint application software for making presentations. And also Microsoft Office package playing a significant role in students' academic activities.

2.1.3 Technology skills

Permalink (skillpages, 2010) says An analysis of Work-Based Learning Plans from across Massachusetts shows that interacting with other people, organizing information, writing, problem solving and critical thinking are vitally important, along with technical skills in the specific field, such as web design, programming, software installation, computer and AV equipment setup, and computer repair.

2.2 Involvement of student

Depict students' willingness to participate in routine school activities, such as attending class, submitting required work, and following teachers' directions in class. (Chapman, E. (2003) "Assessing student engagement rates,"). However, the term is also increasingly used to describe meaningful student involvement throughout the learning environment, including students participating

in curriculum design, classroom management and school building climate. (Fletcher, A. (2005).

In a 1984 article Alexander Astin presented what he referred to as “student involvement theory” which, as opposed to traditional pedagogical approaches, does not focus on subject matter and technique, but on the motivation and behavior of students. Astin’s theory looks at student involvement, which he defines as “the amount of physical and psychological energy that the student devotes to the academic experience” (p. 297). This definition incorporates time and energy spent studying, time on campus, participation in student organizations, and interaction with faculty members.

Astin’s theory has five basic postulates:

1. Involvement refers to the investment of physical and psychological energy in various objects.
2. Regardless of its object, involvement occurs along a continuum.
3. Involvement has both quantitative and qualitative features.
4. The amount of student learning and personal development associated

with any educational program is directly proportional to the quality of student involvement in that program

5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement (p. 298).

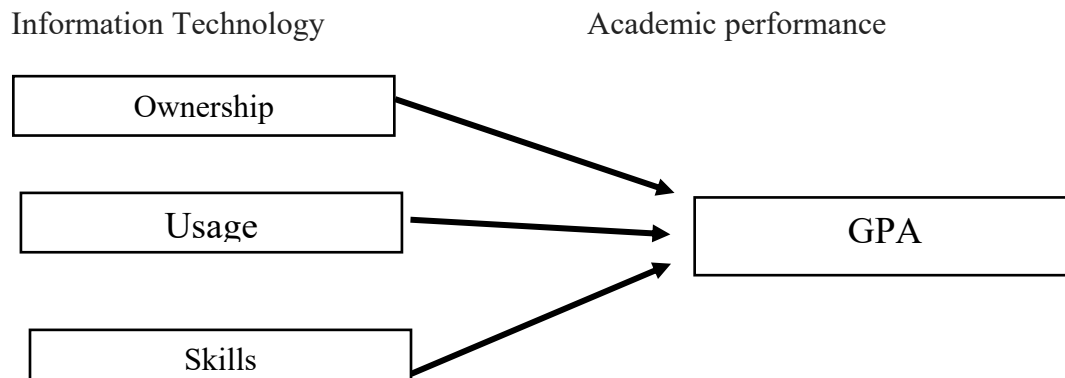
Hence the student’s involvement is measure by Academic performance. In practically the academic performance will evaluate by GPA

2.2.1 Grade Point Average

The great Schools Partnership says about the Grade Point Average GPA, A grade point average is a number representing the average value of the accumulated final grades earned in courses over time. More commonly called a GPA, a student’s grade point average is calculated by adding up all accumulated final grades and dividing that figure by the number of grades awarded.

This calculation results in a mathematical mean or average of all final grades. The most common form of GPA is based on a 0 to 4.0 scale.

3. Conceptual Framework



(Extracted from Judith Borreson Caruso, 2004)

4. Methodology

4.1 Research Design

Quantitative research method was utilized in this study for analyzing the collected data statically and numerically.

4.2 Study Setting

For the study, data were collected based on primary and secondary sources. Primary data is collected by questionnaire and secondary data collected from past research papers, literature, reports and internet.

To get an in-depth understanding of issues which factor influences on GPA among third year commerce and management students, questionnaire was issued to collect data from a sample of 45 third year students of management, Eastern

University, Sri Lanka based on simple random sampling method.

4.3 Unit of Analyses

The unit of analysis refers to the level of aggregation of the data collected during the subsequent data analysis stage. This study is concerned the unit of analysis will be the individual student of selected faculty of Eastern University Sri Lanka.

4.4 Time Dimension

Data were collected at one time from the respondents. It is a cross sectional design.

4.5 Sample Size

The population of Third year faculty of commerce and management students of Eastern University, Sri Lanka is 150 students. Among them 75 students are from Management. Using random

sampling method, 45 third year management students were selected to investigate that the factors influencing on Grade Point Average (GPA) of Third Year Commerce and Management Students of Eastern University, Sri Lanka.

4.6 Method of Measurement

The questionnaire was originally developed by Judith Borreson Caruso, 2004. I have used for this study and it includes demographic factors and variable questions. Likert Scale from strongly disagree to strongly agree (1 – 5) was applied in the questionnaire to evaluate responses. The numerical values were given for the purpose of quantification of variable as follows:

1. Strongly disagree
2. Disagree
3. Neither Agree nor Disagree

OGPA and Awards of Degree

Awards	OGPA
First Class Honors	=3.70 or > than 3.70
Second Class (Upper division) Honors	=3.30 - < 3.70
Second Class (Lower division) Honors	=3.00 - < 3.30
Pass	=2.00 - < 3.00

Source – Student Prospectus – 2013, Eastern University, Sri Lanka

Decision criteria for correlation analysis

4. Agree
5. Strongly agree

4.7 Data Analysis and Evaluation

Data was analyzed using descriptive analysis, frequency analysis, correlation analysis and regression analysis of sample from SPSS software application. Hence under the descriptive analysis, mean and standard deviation was derived from the analysis of samples. Furthermore criteria shown in table were adopted to evaluate relationship between variables.

Evaluation criteria for mean value

Range	Decision Level
$1 \leq X \leq 2.5$	Low level
$2.5 \leq X \leq 3.5$	Moderate level
$3.5 \leq X \leq 5.0$	High level

Source- Formed for this research

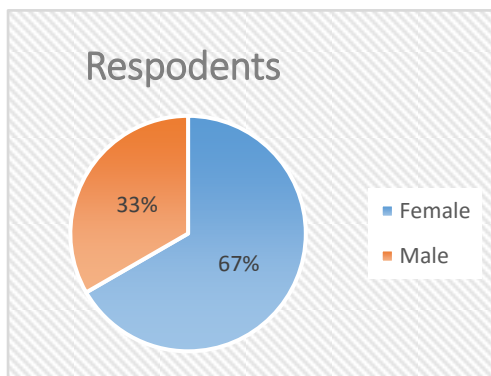
Range	Decision Attributes
r= 0.5 to 1.0	Strong positive relationship
r= 0.3 to 0.49	Moderate positive relationship
r= 0.1 to 0.29	Weak positive relationship
r= -0.1 to -0.29	Weak negative relationship
r= -0.3 to -0.49	Moderate negative relationship
r= -0.5 to -1.0	Strong negative relationship

Source- Formed for this research

5.Data Analysis

5.1 Demographic factor analysis

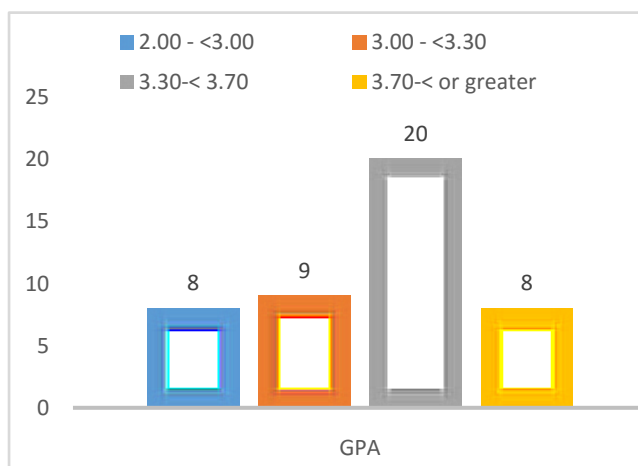
Gender



This Figure shows that the study included 45 respondents among them, female are 66.67% which means 30 peoples are female students. And 33.37% students are male students responded. It is equal to 15 students.

5.2 Descriptive Analysis

GPA Analysis



This GPA chart show that among the 45 students, the students who are got 3.30-< 3.70 range at the maximum number (20). There are two ranges GPA at low level (8) 2.00-< 3.00 and 3.70-< or greater. And there are students have 3.00-< 3.30.

Mean Analysis of technology use

Descriptive Statistics			
	N	Mean	Std. Deviation
Technology use	45	4.72	.330

The above table shows the mean value as 4.72. It indicates that a higher level of technology use among the respondents.

Mean analysis of technology skills

Descriptive Statistics			
	N	Mean	Std. Deviation
Technology skills	45	4.62	.428

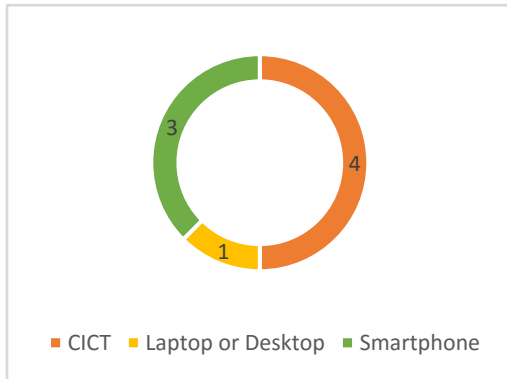
The table shows that the mean value of technology skill is 4.62. Which is also fall under the higher level. Though we can get the answer, there is higher level of technology skill among the respondents.

Comparison analysis for the Technology ownership and GPA

GPA * Technology ownership Crosstabulation					
Count					
		Technology ownership			Total
		Through CICT lab	Own a laptop or desktop	Own a smartphone	
GPA	2.00 - <3.00	4	1	3	8
	3.00 - <3.30	2	4	3	9
	3.30-< 3.70	5	7	8	20
	3.70-< or greater	2	0	6	8
Total		13	12	20	45

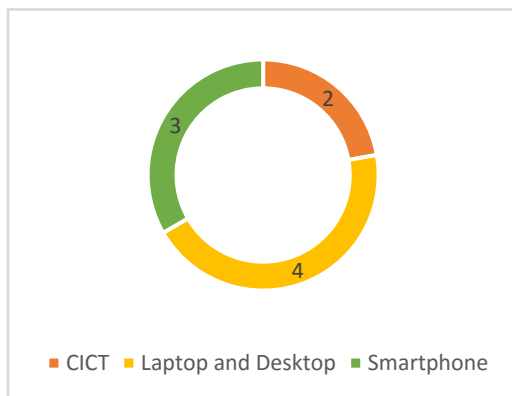
The table shows the similarity of technology ownership sub division (CICT, Laptop or desktop, and Smartphone) and GPA sub division (2.00-<3.00, 3.00-<3.30, 3.30-<3.70, 3.70-< or greater).

GPA Pass category (2.00-<3.00)



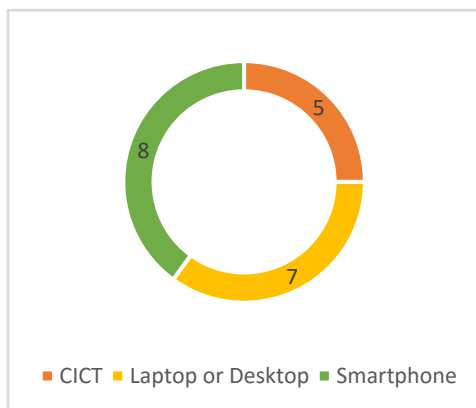
Total number of respondents in this category is 8. The major number (4) of respondent are belong to CICT. And lower number (1) of respondents are belong to having Laptop and desktop. And there is 3 respondents having passing GPA who are fall into smartphone users.

GPA Second Lower category (3.00-<3.30)



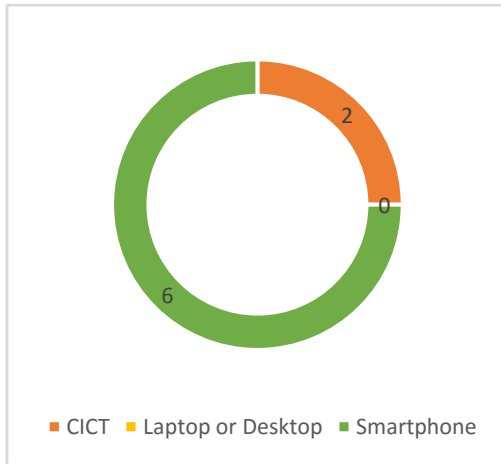
Major respondent have fall in sub-division of having laptop or desktop (4). And lower level of respondents belong to CICT which is 2. And 3 smart phone users also having second lower GPA.

GPA Second upper category (3.30-<3.70)



Total number of respondents are fall in this category is 20. In this category most number of respondents have smart phones. And also lower number of respondents are fall in category of CICT. And also significant number are fall in category of owning Laptop or desktop.

GPA first class category (3.70-< or greater)



In this category there are 8 respondents. Major respondents are having smart phone and rest of respondents are category of CICT. But there is no one from having laptop or desktop.

Correlation Analysis

Correlation analysis will elaborate the relationship between the variables. Though relationship between GPA, technology ownership, Technology Use, Technology Skill will be explain below.

Correlations		GPA	Technolo gy ownersh p	Technolo gy_usage	Technolo gy_skills
GPA	Pearson Correlation	1	-.122	.335*	.058
	Sig. (2-tailed)		.424	.024	.705
	N	45	45	45	45

GPA has a negative low level of relationship with technology ownership (-0.122). GPA has a positive modrate relationship with Technology usage (0.335). and GPA has a weak positive relationship with technology skills.

Regression analysis

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficient	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.048	2.642		-1.532	.133
	Technology_usage	1.062	.425	.356	2.500	.017
	Technology_skills	.654	.436	.285	1.498	.142
	Technology_ownership	-.389	.229	-.323	-1.698	.097

The learner relationship between GPA and Technology ownership, Technology skills and Technology usage. Above table shows the learner relationship, the technology usage has the higher coefficient it is 1.062 and lower coefficient is technology ownership it is -0.389. the technology Skills has coefficient of 0.654. The

technology usage has the p-value is 0.17 which mean it has significant relationship with GPA ($0.017 < 0.05$). and technology skill and ownership do not have significant relationship with GPA. Because the technology skills has the p-value of 0.654 ($0.654 > 0.05$) and technology usage has the p-value of 0.097 ($0.097 > 0.05$).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.418 ^a	.175	.115	.926

In above table shows the R- Square value is 0.175 which means GPA of respondent 17.5% variances explain by Technology usage, technology skills and technology

ownership. And rest of 82.5% will be explained by other factors.

6. Conclusions and Recommendations

6.1 Conclusions

The study focused about the technology influences on students' academic performance in third year commerce and management students, Eastern University. Hence the performance was evaluate by the GPA. And technology was measured by Technology ownership, usage, skills. Though the technology usage will decide the academic performance of the students. Rest of the variable do not influence on students' academic performance.

6.1 Recommendations

The student should involve their academic activities through Information Technology. Because, the usage plays an important role in the academic performance. If students contribute more with usage of Information Technology that will lead to good academic performances. But, there are other factors also influencing on the academic performances. Because the Information Technology Explain only 17.5% variance. Rest of the variance will be explained by other factors.

References

- [1] Alexander Astin (1984), Student Involvement Theory
- [2] Brain, (2009) TechParticipation, <http://techparticipation.blogspot.in/2009/09/technology-integration-definition.htm>
- [3] Chapman, E. 2003, Assessing student engagement rates
- [4] Dailymirror news paper, <http://www.dailymirror.lk/article/Sri-Lanka-computer-ownership-falls-as-usage-of-smartphones-tabs-gains--126727.html>
- [5] <http://edglossary.org/grade-point-average/>
- [6] <http://skillspages.com/blog/?p=202>
- [7] Judith Borreson Caruso 2004, ECR study of students anformation technology.
- [8] Skillpages 2010, <http://skillspages.com/blog/?p=202>
- [9] Tech Target (<http://searchdatacenter.techtarget.com/definition/IT>)
- [10] YONG ZHAO, KEVIN PUGH, STEPHEN SHELDON and JOE L. BYERS, 2002, Conditions for Classroom Technology Innovation, teachers college volume 104, PP 482-515