THE IMPACT OF ICT ON STUDENTS' PERFORMANCE: A CASE STUDY ON UNDERGRADUATE UNIVERSITY STUDENTS

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ABSTRACT

Information and communication technology (ICT) now a days is the part and parcel of our daily life . Even the students also are spending a lot of their time using the ICT or internet facilities. This study has explored the impact of ICT on the performance of students at the undergraduate level. The research sample was taken from a group of students studying in the undergraduate level at different private and public universities in Bangladesh. The study found that there is not significant relation between the use of ICT and the performance of the students but the ICT addiction (habit based use of internet everyday) affects the performance of the students negatively. Finally, the study suggests that proper steps should be taken by the academic or related institutions to promote the use of ICT for focusing academic purposes so that the students may be benefitted much of using ICT.

Keywords: ***Information and communication technology, ICT addiction, Undergraduate student, Student performance.***

1. INTRODUCTION

ICT stands for "Information and Communication Technologies", that refers to technologies which provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication medium1```. In Wikipedia it is defined as:

"Information and communications technology (ICT) is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified

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communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information."

The impact and use of ICT has become a new topic of argument in the area IT in different sectors mainly in education. Educators use ICT as a modern tool that enables to modify the teaching methods in order to improve students' performance. Educational institutions are adopted ICT based teaching method and offering ICT related academic programs.

Students are availing the ICT facilities using different smart devices and internet. So it is essential to measure the students' openness to ICT and its impact on students' performance.

1.1 Objectives of the Study

The broad objective of the study is to find out the relationship between use of ICT facilities and performance of the undergraduate level students.

The specific Objectives are:

i.   To identify the reasons for students access to ICT facilities;

ii.   To explore how and how much students spend their time by using ICT.

iii.   To find out relationship between students use of ICT on academic and non-academic purpose and their performance.

1.2 Literature Review

The use of ICT and the impact on student performance in higher education is not immaculate and found mixed results in the literature. Earlier research has failed to provide a clear harmony regarding the effect of ICT on students' success.

Firstly, some studies could not show a realistic impact of ICT on students' performance in higher education. The evidence on the effect of computers and internet in schools on students' performance is much more limited. Kirkpatrick and Cuban (1998) found that the effect of computer use on student performance is questionable. Similarly, Goolsbee and Guryan (2006) report that, increased uses of computers and internet connections have had no measurable impact on any measure of student's achievement. Additionally, Conrad (1997) found that, although Internet use increases enjoyment, there are no statistically significant gains observed in student academic performance. In the same way Trucano (2005) identified that ICT impact on schools and concludes that the impact of ICT use on learning outcomes is unclear. Identically Sosin, Blecha, Agawal, Bartlett; and Daniel (2004) conduct a study on USA in 2002 and they found significant but small positive impact on students' performance due to ICT use. But they show that some ICT seem to be positively correlated to the performance while the others are not.

Moreover some other researches show mixed result like Coates and Humphreys (2004); Banerjee, Cole, duflo, and linden (2004); Leuven, Lindahl, Oosterbeek and Webbink (2004); Brown and Liedholm (2002); Angrist and Lavy (2002); demonstrate that there is no evidence of ICT playing a key role in higher education.

On the contrary, some studies show a factual impact of ICT on students' achievement. Agarwal and Day (2000) find that creative use of the Internet allows use of small class interactive techniques in larger classes and has a beneficial impact on student performance. One important assumption by (Polly, 2011: 12-14) "Technology has been shown to positively influence student learning when students explore technology-rich tasks that simultaneously require them to use higher-order thinking skills (HOTS), such as analyzing or evaluating information or creating new representations of knowledge." A very important study conducted by (Balanskat, Anja, Roger and Kefala, 2006) the result reveals that, ICT impact on competency development, team work, independent learning and higher order thinking skills. Furthermore, 86% of teachers in Europe state that students are more motivated and attentive when ICT facilities are used in class. Not only ICT has a strong motivational effect and positive effects on behavior, communication and process skills, but also students feel greater responsibility for their own learning when they use ICT, working more independently and effectively. So it can be said that, ICT helps to improve the quality of learning and educational outcomes. Moreover, Fuchs and Woessman (2004) use of digital technologies in higher education can have significant positive effects both on students' attitude and achievement.

The similar positive result on impact of ICT on student performance found in several studies such as, Talley (2005); Sosin, et. al (2004); Coates et.al (2004); Li, Boeuf, Basu, and Turner (2003); Kulik (1999); Attwell and Battle (1999). Finally some other surveys like as, (Iqbal, & Ahmed, 2010; Hameed, 2006; Amjad, 2006; Khan, and Shah, 2004) argue that, in order to be successful, a country should improve its education system by implementing effective and robust ICT policies.

From the above studies we understand that there are mixed results regarding the relationship between the use of ICT in higher education and the students' performance. In our study we try to find the exact relationship between these two variables would provide the real scenario.

The objective of the study is to measure various impact of ICT on education and the consequences in implementing the ICT based education. For our study purpose students' CGPA refer is the basis of performance; the higher CGPA indicates higher performance and the lower CGPA indicates lower performance.

2. METHODOLOGY OF THE STUDY

In order to achieve the objectives of this study we have used primary source of information. Primary data have been taken from the respondents through a close ended questionnaire. The sample size of the study was chosen from the BBA students at the different public (Dhaka University) and private (East-West, BUBT, UITS, UIU and ULAB) Universities. The sample size consisted of 300 students (those who have completed at least 3 semesters with their results published) and a questionnaire was provided to them in order to fill it in. The questionnaire was divided into two main areas. The first part of the questionnaire sought demographic characteristics, living conditions, and academic status of the respondents in the sample. The second part of the questionnaire focused ICT facilities available for students and purpose of internet use. This part attempted to examine whether the

respondents have computer and Internet access, whether they use these for their academic purpose or other purposes like watching movies, social networking, listening to music or browsing only for entertainment. In terms of data analysis, correlation analysis was used, applying SPSS, to identify the impact of ICT on the CGPA (performance) of the students. Correlation was calculated between these variables 'CGPA' and 'access to ICT'.

3. ANALYSIS AND FINDINGS
3.1 Performance comparison of the respondents
Table 1 (appendix-I) shows the performance (CGPA) of the respondents and comparison of performances on the basis of the percentage of the total scale of results. It is noticed that the performances of the students are gradually decreasing (from 81% to 76% to 73.25%).

3.1.1 Academic Use of ICT
Table 2 (appendix-I) shows the descriptive statistics of the variables regarding the academic use of ICT. The scale for the first variable (Hours spent on web browsing per week) is 1=Less than 10 hours, 2= 10 – 20 hours, 3= 20 – 30 hours and 4=More than 30 hours. The scale for the rest of the variables is same, that is 1=Most of the time, 2=Sometimes, 3=Rarely and 4=Never.

The descriptive results of the above table (table 2, given in the appendix-I) tells that most of the respondents use more 15.6 hours internet and other ICT facilities per week that means about 2 hours per day (since the mean value is 1.56) but they rarely use these to download books (mean value 2.42) or to browse some information which will be helpful for their exam preparation (mean value 2.35). Sometimes the respondents use internet to prepare their lecture sheet or to prepare their presentation slides (the mean value of the second variable: Browsing internet to prepare lecture sheet and the third variable: Browsing internet for presentation slides and other information are 1.90 and 1.65 respectively). That means the time they spent on web browsing per week major of them they spent for non-academic or social media or recreational purpose. However the results of the tables will make it clear.

3.1.2 Non-academic and Social use of ICT
Table 3 (appendix-I) shows the descriptive statistics of the variables regarding Non-academic and Social use of ICT. The scales for the variables shown in the table 3 are given in the following table:

Table I: Scale for the variables shown in the table 3.

Variable	Scale
Browsing non-academic sites	1=Most of the time 2=Sometimes 3=Rarely 4=Never

Social media accounts with	1=Facebook 2=Twitter, 3=Both Facebook and twitter, 4=Google plus 5=Others
Frequency of use of social media	1=More than once in a day 2=Once in a day 3=At least once in week 4=At least once in a month
Hours spent on social media per week	1=Less than 10 hours 2= 10 – 20 hours 3=20 – 30 hours 4=More than 30 hours
Primary use of social media	1=Keep in touch with friends, family and peers 2=Keep in touch with academic friends for academic purpose 3=Others

In the results, (table 3, appendix-I) it is noticed that that most of the respondents use about 15.1 hours internet and other ICT facilities per week (mean value 1.51) on different social media accounts (basically facebook sometimes tweeter: mean value 1.49). So from the table 2 and 3 it is found that the respondents spend total hours for web browsing is more than 15.6 per week while they spend time in social and other non academic purpose is about 15.1 hours per week. That means the half an hour spent per week is for academic purpose only. This finding support the result of the table 1(appendix-I) that is the time they spent on web browsing per week major of them they spent for non-academic or social media or recreational purpose. So the respondents spend very much little time in web browsing and internet for their academic purpose (about 1 hour) per week.

3.2 ICT Addiction

Table 4 (appendix-I) shows the descriptive statistics of the variables regarding ICT Addiction. The scales of the variables are given in the following table:

Table II: The scales of the variables shown in the table 4

Variables	Scales
Browsing recreational sites	1=Most of the time 2=Sometimes 3=Rarely 4=Never
Browsing internet for watching movies and other recreational clips	1=Most of the time 2=Sometimes 3=Rarely 4=Never

Downloading movies and dramas from internet	1=Most of the time 2=Sometimes 3=Rarely 4=Never
Regular use of internet as habit	1=Yes 2=Not yet 3=Never
Respondents can't even keep themselves away from using internet during exam. (because of habit)	1=Yes 2=I don't do this during my exam

The table (table 4) shows the mean value of the variable (Regular use of internet as habit) is 1.66. That means the regular use of internet is becoming a habit of some respondents. For this some of them cannot keep themselves away from using internet during the time of exam. (mean value 1.7). So these two causes may lead the low performance of the respondents using ICT. Following correlations tables will give the concrete decision regarding this hypothesis.

3.2.1 Correlations between non-academic & social use of ICT and Students performance

The above table (table 5, given in the appendix-I) shows the correlation statistics between the variables of academic and social use of ICT and Browsing non-academic sites & Hours spent on social media per week and students performance. And it is found that there is not significant positive or negative correlation between the performance of the students and the variables (.049 and .082 respectively). So this result says that though the respondents use majority of their time spent for social or non-academic media browsing it has not so much effect on their performance (CGPA).

This survey found that some of the students are much more addicted to the regular browsing of internet even in the time of exam they cannot keep themselves away from it. Following table says whether this tendency of the students affect their performance or not.

3.2.2 Correlations between the variables of ICT addiction and Students performance

The above table (table 6, given in the appendix-I) shows the correlation statistics between the ICT addictions and regular use of internet as habit & respondents using internet during exam (because of habit) and students performance. And it is found that there is not significant positive or negative correlation between the performance of the students and using internet during the time of exam (because of the regular internet using habit), but there is a negative correlation between the regular use of internet as habit and the students' performance. That means whether they use internet is not so much crucial, but the most influential factor is whether they use it as habit or not. So it can be decided that the habit based regular use of internet or ICT (the researchers named it ICT addiction) affect the performance of the students negatively. This is the major cause of low performance of the students using ICT.

4. RECOMMENDATIONS

- It has been found through this study that students, who do use ICT, use it mostly for non-academic purposes. In order to ensure that the ICT facilities made are accessed to enhance academic performance.

- There should be enough logistic supports within the academic institutions in order to allow all students to have regular access to ICT facilities but need strict supervision.

- Some students are avoiding the use of ICT. Such notion should be reversed with initiatives taken by the educational institutions themselves if we are to enjoy the benefits of technological advancement.

- Educational institutions need to take an active initiative to introduce the students to ICT by highlighting ways through which it can be of great help in enhancing their academic performance. This would make the use of ICT much more relevant to academic tasks.

- Parents need to be very conscious to ensure that their child should not too much involve of using ICT for recreation purpose. Because ICT addiction could be the cause of low performance as well as physiological imbalance.

5. CONCLUSION

In this era where technology is playing an important role in our daily activities including the academic arena, so it is the high time we assessed the impact of ICT in our daily life and ensured its positive use as much as possible. In this context, this study reveals a fact that the habitual use of ICT which is named ICT addiction affects negatively on the performance of the students. If proper steps are taken by the academic or related institutions to promote the use of ICT for solely academic purposes taking into consideration the findings and recommendations of this study, the students would be better benefitted using ICT.

6. LIMITATIONS OF THE STUDY

Following limitations are pointed out in this study:

- o Research area: the area of this research is not so wide rather it is confined into few universities. It could be more wider;

- o Tendency to hide the truth: the respondents are found to feel shy to answer the private questions or to show over estimating tendency to answer the questions regarding their performances;

- o Data collection method: the data are collected through the class teachers before or after the class, where some of the respondents might be biased by others, rather it could be through mail survey.

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Appendix I: Tables

Table 1: Descriptive statistics of Performance (CGPA)

Part I: Performance (Results) comparison							
Variables	N	Minimum	Maximum	Mean	Std. Deviation	Average CGPA	% of total scale
SSC	300	1.00	4.00	3.1500	.87753	4.05	81 (Scale 5)
HSC	300	1.00	4.00	2.9600	1.05931	3.80	76 (Scale 5)
CGPA up to the current semester	300	1.00	6.00	3.1600	1.40748	2.93	73.25(Scale 5)

Table 2: Descriptive statistics of Academic Use of ICT and Internet

Part II: Academic Use of ICT					
Variables	N	Minimum	Maximum	Mean	Std. Deviation
Hours spent on web browsing per week	300	1.00	4.00	1.5600	.95364
Browsing internet to prepare lecture sheet	300	1.00	4.00	1.9000	.72277
Browsing internet for presentation slides and other information	300	1.00	4.00	1.6500	.79347
Downloading and reading books from internet	300	1.00	4.00	2.4200	.94157
Browsing internet for exam preparation	300	1.00	4.00	2.3500	.87484

Table 3: Descriptive statistics of Non-academic and Social use of ICT

Part III: Non-academic and Social use of ICT					
Variables	N	Minimum	Maximum	Mean	Std. Deviation
Browsing non-academic sites	300	1.00	4.00	2.0500	.90011
Social media accounts with	300	1.00	5.00	1.4900	.94492
Frequency of use of social media	300	1.00	4.00	1.6600	.90948
Hours spent on social media per week	300	1.00	4.00	1.5100	.85577
Primary use of social media	300	1.00	3.00	1.3400	.62586

Table 4: Descriptive statistics of ICT Addiction

Part IV: ICT Addiction					
Variables	N	Minimum	Maximum	Mean	Std. Deviation
Browsing recreational sites	300	1.00	4.00	2.0400	.90617
Browsing internet for watching movies and other recreational clips	300	1.00	4.00	2.0900	.97214
Downloading movies and dramas from internet	300	1.00	4.00	2.0500	.93295
Regular use of internet as habit	300	1.00	3.00	1.6600	.72536

Respondents can't even keep themselves away from using internet during exam. (because of habit)	300	1.00	2.00	1.7000	.45902

Table 5: Correlations between the variables of non-academic & social use of ICT and Students performance

		Browsing non-academic sites	Hours spent on social media per week	Performance (current result)
	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	300		
	Pearson Correlation	-.176**	1	
	Sig. (2-tailed)	.002		
	N	300	300	
Performance (current result)	Pearson Correlation	.049	.082	1
	Sig. (2-tailed)	.397	.157	
	N	300	300	300
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 6: Correlations between the variables of ICT addiction and Students performance

		Regular use of internet as habit	Respondents using internet during exam.	Performance (current result)
	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	300		
	Pearson Correlation	-.216**	1	
	Sig. (2-tailed)	.000		
	N	300	300	
Performance (current result)	Pearson Correlation	-.035	.018	1
	Sig. (2-tailed)	.541	.761	
	N	300	300	300
**. Correlation is significant at the 0.01 level (2-tailed).				