काशी हिन्दू विश्वविद्यालय

BANARAS HINDU UNIVERSITY

Department of Statistics
Institute of Science (BHU)

'The Effect of Digital devices Usage on Student Academic Performance'

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Submitted by

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ABSTRACT

This study determined to identify the effects of Digital devices, as a learning tool on the academic performance of students. This utilized the descriptive correlational design methods in order to achieve the purpose in identifying the level of Digital devices use and academic performance of students. This study was conducted at Banaras Hindu University, among 205 respondents, determined through Slovin's formula.

The study utilized a questionnaire adopted from Maria Limniou "The Effect of Digital devices Usage on Student Academic Performance". Mean, Pearson product-moment correlation, and linear regression was used to determine the effects of using Digital devices as a learning tool on the academic performance students.

Findings revealed that level of used of Digital devices as a Learning Tool obtained an overall mean of 2.84. It indicates further that their level of used of Digital devices as a Learning Tool was effective in their learning. It revealed that the Academic Performance of students obtained an overall mean 87.35. It implies further that their academic performance was very satisfactory. It was found on the correlation analysis of Digital devices Use as a Learning Tool and Academic Performance of Students are related to each other. The more the students used Digital devices as a learning tool, the more they improve their academic performance.

Findings revealed that the regression analysis of effects of Digital devices as a learning tool on the average grade showed the significant variable contribution to the effects of Digital devices as a learning tool on the average grade.

TABLE OF CON TENTS

Objective

The following things are to be in concern during study of the effects of Digital devices in the learning performance of students-

- What type of personal Digital devices (PDDs) do university students use?
- What is the student's pattern of using personal Digital devices (PDDs)?
- What are the positive effects of common technological devices to the performance students?
- What are the negative effects of common technological devices to the performance of students?
- Is there a significant relationship between using Digital devices and the learning performance of students?
- What are the positive effects of common technological devices to the performance students?

INTRODUCTION

In the 21st century, which is called the digital period, technological revolutions and inventions have provided the world with different products with different purposes. One of the most influential products of it is the (Laptop & smart phones) .

The first machine that looked like today's laptops—flat screen in a clamshell design over the keyboard—was the grid Compass. British designer Bill Moggridge created it in 1979.

While A smartphone is a cellular telephone with an integrated computer and other features not originally associated with telephones, such as an operating system (OS), web browsing and the ability to run software applications. Smartphones are used by students as part of progessive learning & for improving academic performance . The first smartphone was designed by IBM and sold by BellSouth (formerly part of the AT&T Corporation) in 1993.

Nowadays, Digital devices is not only being called as a tool to use for connecting others, but it is also used for several purposes such as surfing information related to researches and education. Some examples are the following: online searching, gaming, chatting, video calling, etc. These are some of the applications that may affect the people especially the students in their academic performance. According to the study of Erin Schreiner in the webpage SCIENCING, he said that the biggest lament of teachers in regards to Digital devicess is that it leads to student distraction and off task behavior (Schreiner, 2017).

The main objective of this study is to know the effects of Digital devices as a learning tool on the academic performance of students. The researchers will conduct a survey among graduate's of different institutes of india.

This survey determines whether Digital devices (basically laptop & smart phones) as a learning tool can affect their academic performance.

This study therefore attempts to find out the effects of Digital devices (basically laptop & smart phones) as a learning tool among Students on their academic performance. Also, to check whether or not there will be a significant relationship between Digital devices (basically laptop & smart phones) use as a learning tool and academic performance of students.

Statement of the Problem

The main purpose of the study is to identify The effects Digital devices (basically laptop & smart phones) as a Learning Tool on the Academic Performance of Students to attempt the answer of following questions:

- What is the level of use of Digital devices (basically laptop & smart phones) as a learning tool ?
- What is the academic performance of the students?
- Is there a significant relationship between Digital devices (basically laptop & smart phones) use as a learning tool and academic performance students?
- Is there an effect of Digital devices (basically laptop & smart phones) as a learning tool on the academic performance of the students?

Significance of the Study

This research explored the effects of Digital devices (basically laptop & smart phones) towards the academic performance of the Students. This study aimed to create awareness among students about the efficient use of Digital devices in their studies.

The result of this research will be a good source of information for the readers regarding the effects of Digital devices (basically laptop & smart phones) to student's academic performance. This study would give factual information among the students on how they can use their Digital devices on a proper manner.

This study would provide evidence to the teachers on the effectof Digital devices (basically laptop & smart phones) as a learning tool on the academic performance of their students and would educate the community on the possible effects of Digital devices towards the academic performance of the students.

This study would serve as an answer to the researchers to have comparative analysis and basis for the future study regarding the effect of Digital devices (basically laptop & smart phones) as a learning tool on the academic performance of the students and add variable that were not included in this study.

Scope and Delimitation of the Study

The main objective of the study is to determine whether the of Digital devices (basically laptop & smart phones) use has an effect on the academic performance. The study will be conducted by students of undergarduate of Banaras Hindu University, varanasi . The respondents of this project is the graduate's of different institue of india.

Since the respondents are drawn from the graduate's of different institute of india, the references of the conclusions are the subject to this sample. This study is limited to the effects of Digital devices (basically laptop & smart phones) as a learning tool on the academic performance among graduate's of different institue of india.

Writing Appraisal

This chapter presents the review of related literature, theoretical framework, conceptual framework, hypothesis, and schematic diagram. This paper seeks to further understand Digital devices (basically laptop & smart phones) as a learning tool and its relation to the academic performance of the students.

This section presents a brief overview of relevant studies regarding of the effects of Digital devices (basically laptop & smart phones) as a learning tool on the academic performance of students**.**

SmartPhones as a Learning Tool

According to the World Health Organization (WHO) over half the population use Digital devicess and there is an estimated 6.9 billion subscriptions globally as of 2014 (World Health Organization, 2014). The impacts of Digital devices technologies on learning are portability, collaboration and motivation enhancing students, parents and teachers' education system (Barker, Krull, and Mallinson, 2006). The use of Smartphones results in increasing the parents of the student's involvement in education.

In mobile learning, the capacity of the student to learn will increase. According to Eteokleous and Ktoridou (2009), the benefits of Smartphones integration into student learning on campus are useful with the Smartphone capabilities that are easily supporting learning However, Smartphones are so advanced and smart that they actually perform almost the same functions and features as personal computers (Cui and Wang, 2008) and like all communication and computing devices, cell phones, can be used to learn (Prensky, 2004).

With the widespread ownership of Digital devicess among students, mobile phone usage in the classroom is probable. Of the students who own Digital devicess, Froes and colleagues (2012) found that 75% have their cell phones with them in every class period.

According to Pritchard (2009), it stated that it is an individual's preferred means of acquiring knowledge and skills; he also added that it is "a person's typical approach to learning activities and problem solving". Liu (2008) defined it as "approaches to learning which refer to information processed in a preferred way in accordance to learner's habitual characteristics Sarasin (2006) described it as "a certain specified pattern of behavior and /or performance according to which the individual approaches a learning experience".

Academic Performance

According to Steve (2000), academic performance of a student can be regarded as the observable and measurable behavior of a student in a particular situation. For example, the academic performance of a student in English includes observable and measurable behavior of a student at any point during a course. In English students' academic performance students consists of scores obtained from teacher-made test, first term examination, mid-term test, and so on. Therefore, we can equate academic performance with the observed behaviour or expectation of achieving a specific statement of or statement of educational intention in a research (Steve, 2000).

Academic Performance refers to how students deal with their studies and how they complete different assignments given to them by their teachers. The popularity of Digital devicess enlarged briskly in the last span. This is most likely due to the reason that every person used it extensively to get worldwide access Students are paying more attention towards these trends rather than utilizing their time for their studies and this surely affects their academic performance. The destructive effects of these Digital devicess the progressive ones. This is because of the reason that when they are studying, they get attracted to phones to kill the boredom during their study time, side tracking their attention from their work and they forget why they are using it.

According to Craton (2011), playing video games is often associated in our society with poor academic performance. This idea is supported by some research. A 2000 study found a negative correlation between GPA and time spent playing video games (Anderson & Dill, 2000). The correlation was relatively small. A 1997 study suggests that "there is no clear causal relationship between video game playing and academic performance (Emes, 1997, p. 413).

As Digital devices technology continues its rapid development, it appears that the device is also capable in contributing to student learning and can improved academic performance. It shows that it is not always a distraction for learning. For example, modern 'smartphones" provide students with immediate, internet-connected computer, such as online information retrieval, file sharing. and interacting with professors and fellow students (Bull and McCormick, 2012).

Correlation between Measures

There are several researches that have investigated the relationship between Digital devices (basically laptop & smart phones) use as a learning tool and academic performance in various disciplines. In the study of Steve (2000), in which the vast majority of students reported using the Digital devices (basically laptop & smart phones) during time to support their self- learning. In addition, all participants indicated that they used their mobile devices outside of the classroom to facilitate their learning. Clearly, the motivation to use the devices and opportunities to use the devices to learn were not the problem as students found ways to use them with in and outside of their even when specific uses were not provided by instructors (Steve, 2000). Furthermore, it also appeared to be an important shift in the use of Digital devices as students started to see it more as a tool for learning tasks than non-learning tasks. Several studies reveal that students frequently report using a variety of electronic media including cell phones while in class, studying, and doing homework (Jacobsen & Forste, 2011),

However, using Digital devices (basically laptop & smart phones) interfere with school work and consequently revealing school failure (Wood, Zivcakova, Gentile, Archer, De Pasquale and Nosko, 2012). Lepp et al (2014) studied this relationship and found that high frequency Digital devices users tended to have lower academic performance, highly anxiety and lower satisfaction with life relative to their peers who used smartphones less often.

Schematic Diagram

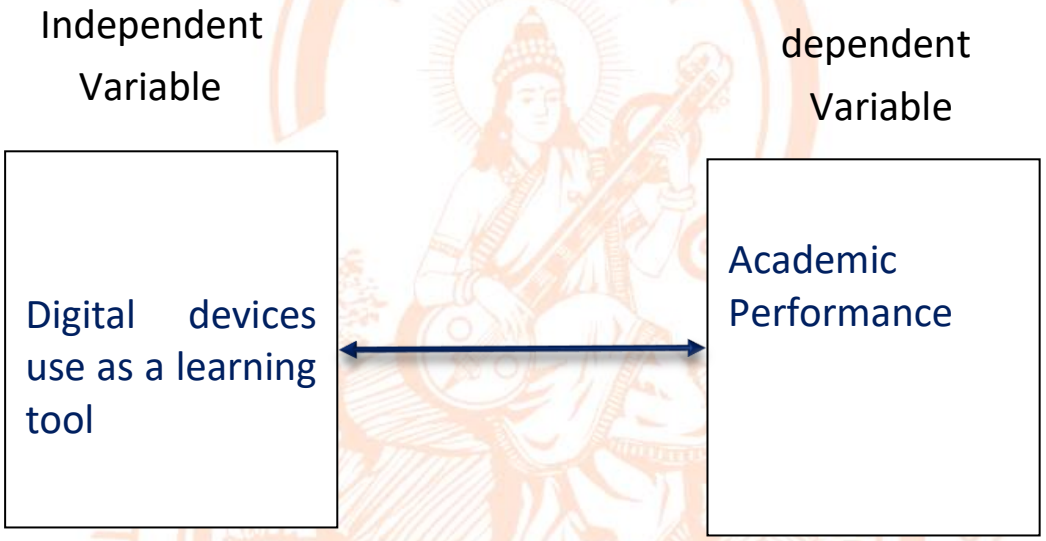


Fig 1: schematic diagram showing relationship between the dependent and independent variable.

Statistical Methodolgies

This chapter deals with statistical technique or procedure during study of The effect of Digital devices on student academic procedure.

SAMPLE SIZE DETERMINATION

- In addition to the size of the population and purpose of study three criteria are set to determine the appropriate sample size: the level of confidence, the level of precision and variability in attributes being measured.
- The level of precision: It is the range of estimated value in which the true value of the population parameter is with a certain probability.
- The Confidence level: It is the probability that the population value lies with in two values.
- Degree of variability: As a proportion of 0.5 corresponds to maximum variability, it is often used in determining more conservative sample size.
- Since population size is unknown to me, I simply take population size large to get a conservative sample size.

SAMPLING TECHNIQUE

- The sampling adopted for this survey is proportional stratified sampling.
- Proportionate stratified sample means that size of sample strata is proportional to the size of population strata; or probability of unit being selected from the stratum is proportional to relative size of that stratum in population.

- The benefit of stratified sampling is that you obtain reasonably precise estimates for all subgroups related to your research question.
- When you have smaller groups in your study, simple random sampling can miss some of them by chance. Stratified sampling helps retain the complete variety of the population in the sample..
- It has numerous disadvantages also, stratified sampling produces benefits only when the researchers can form subgroups that are relatively homogeneous relative to the entire population. If researchers cannot create appropriate strata or the members of a stratum are not reasonably similar, the stratified sample will be ineffective.

Hypothesis of the Study

The hypothesis was tested at a 0.05 level of significance.

H_0: There is no significant relationship in the effects of Digital devices as a learning tool on the academic performance of students

H_1: There is a significant relationship in the effects of Digital devices as a learning tool on the academic performance of Students.

Data collection

- The first step in any statistical enquiry is the collection of relevant data. Data collection methods are important because how the information collected is used and what inferences it can generate are determined by the methodology and analytical approach applied by the surveyor.

- The data of this project was gathered, individually from the respondents. The project personally facilitate the distribution of questionnaires to the respondents during their vacant time.

Questionnaire

A questionnaires was design to conduct the survey of the topic “The Effect of Digital devices Usage on Student Academic Performance”.

Pre-test: A pre-test is conducted to verify that questionnaire is well understood and does not yield obvious bias effects of Questionnaire.

Scoring Procedure

The scale taken for the study of this project is shown in Table 1 –

Descriptive Scale	Numerical Scale
Not at all	1
Small Extent	2
Moderate Extent	3
Fairly Great Extent	4
Great Extent	5

Table 1

Cronbach's Alpha (CA) was calculated to determine the internal consistency of 46 statements which results in 0.715 and hence acceptable for good consistence reliability index.

Cronbach's Alpha:

$$\alpha = \left(\frac{k}{k-1}\right)\left(\frac{s_y^2 - \sum s_i^2}{s_y^2}\right)$$

- K No. of item
- S^2_y variance of poulation
- Σs^2_i sum of variance among all item

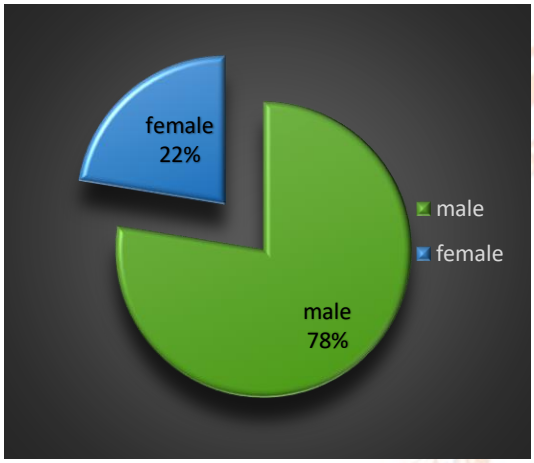
Using above formula in excel we get overall CA value is 0.725, which is quite acceptable for internal consistency of data.

RESULTS

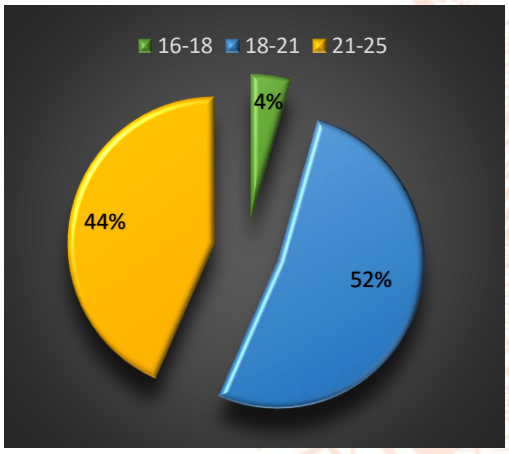
This chapter presents the results and discussion of the gathered data as ,

Some basic detail of respondent, that I gathered during survey will be presented in formof pie chart.

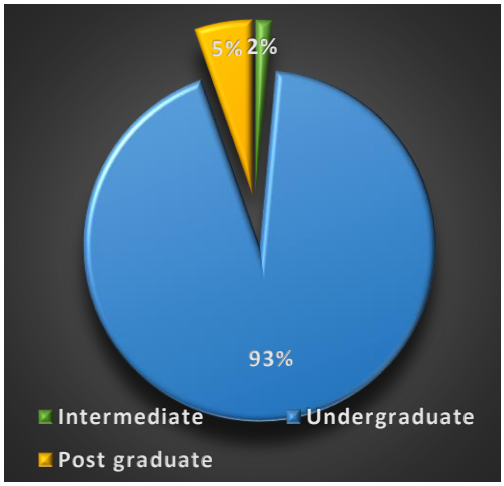
Out of the 205 respondents,



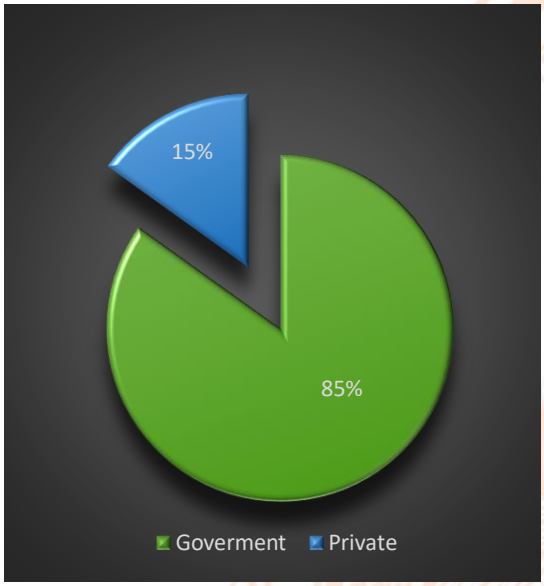
majority respond of 159 (66%) were Male and 46 (22%) were Female;



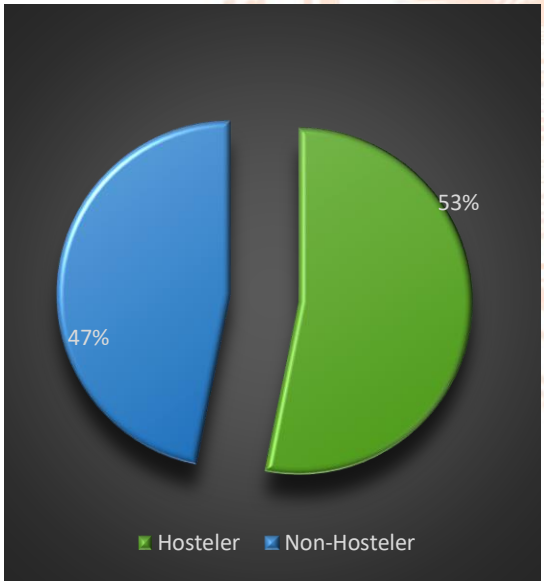
107(52.2%)respondents were between 18-21 years of age, 89(43.4%)respondents were between 21-25 while only 9 (4.4%) were aged less than 18.



3(2%) respondents were intermediate students, 191(93%) Undergraduate, 11(5%) were Post graduate;



174 (85%)respondents were goverment institute student while only 31 (15%) were private institute student;



109 (53.2%)respondents were live in goverment institute hostel while only 96 (

Types of Personal Digital devices (PDDs) owned.

Most of the respondents reported that they very often use smart phones having touch screen, internet access & social media apps i.e. Facebook, WhatsApp, skype, etc. for their academic purposes. They also reported that they very often used their Digital devicess with basic communication functions for educational purposes.

Out of 46 female respond they have following types of Digital devices-

Types of Digital devices	Total	Percentage
Smart phones	32	59.3
Smart phones+ Laptop	12	22.2
Smart phones +Laptop + ipod	6	11.1
Smart phones+Laptop+(i.e. kindle)	2	3.7
Tablets or ipod	2	3.7
LAPTOP	0	0.0

Table 2

From above table see that most of female(about 60%) have only Smart phones (having touch screen, internet access & social media) for their academic educational purpose, (83%) have Smart phones (having touch screen, internet access & social media) or Laptop.

No one have dependent on only laptop for their academic performance & (about 97%) female depend on Digital devices for their studies instead of ipod and remaining (3%) depend only on Tablets or ipod.

Out of 159 Male respond they have following types of Digital devices-

Types of Digital devices	total	percentage
Smart phones	84	51.5
Smart phones+ Laptop	60	36.8
Smart phones +Laptop + ipod	4	2.5
Smart phones+Laptop+(i.e. kindle)	5	3.1
Tablets or ipod	2	1.2
LAPTOP	8	4.9

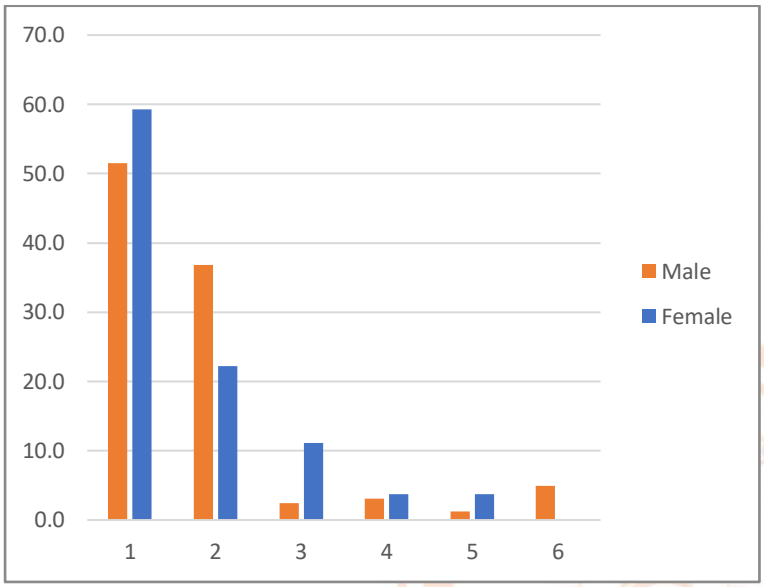
Table 3

From above table see that (about 51.5%) male have only Smart phones (having touch screen, internet access & social media) for their academic educational purpose, (88.3%) have Smart phones (having touch screen, internet access & social media)or Laptop.

About (5%) dependent on only laptop for their academic performance. This is interesting to observe that the male feel more comfartable on usage laptop then female or male have better idea of usage of laptop then female.

(about 98.8%) depend on Digital devices instead of Tablets or ipod for their studies and remaining (1.2%) depend only on Tablets or ipod.

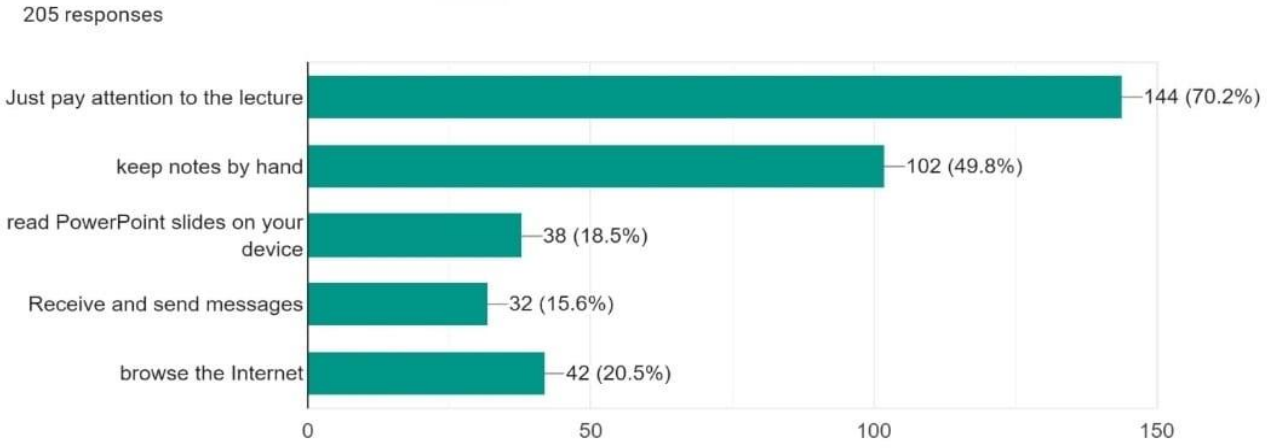
For better understanding of types of owned Digital devices by gender wise a bar graph has been plotted -



1 Smart phones
2 Smart phones+ Laptop
3 Smart phones +Laptop + ipod
4 Smart phones+Laptop+(i.e. kindle)
5 Tablets or ipod

The above graph show that female have more dependent on only smartphones then male for the academic purpose while male have use both Smart phones+ Laptop frequently.

Patterns of Using Personal Digital devices (PDDs)



.

Majority of the respondents very interested in use of Digital devices what professor have taught in classroom & keeps notes by hand, (about 70.2%) students attending the class room in serious manner and believe in teachers knowledge.

Morever (36.1%) respondent affected by Digital devices spent their time receiving and send message and browsing internet. Digital distractions can take many forms, such as social media notifications, emails, instant messages, and online games. When students are distracted by these Digital devices during class, they can miss important information, lose focus, and ultimately perform poorly on exams and assignments.

About (50%) student use Digital devices to make notes while (38%) read online slide or notes to study their academic subjects.

Level of you use of Digital devices on student academic performance

Here we do brief discussion of result on the basis of gathered data as answer.

The Extent of you use of your own device on the basis of study/ study performance:

Table 4 presents the level of use of Digital devices as a learning tool of students. Based on the computed results it indicates that student's level of use on Digital devices as a learning tool obtained an overall mean of 2.84 which can be described as "Fairly Great Extent", meaning, Digital devices is quite effective in improving the academic performance of students.

The result showed that the indicator which got the highest mean was, students always use Digital devices as a learning tool that helps them To complete assignments easily (3.371). This figure consistently suggest that students always use Digital devices for their learning which can be described as "Great Extent", meaning, students used Digital devices as effective for learning.

It was followed by the indicator in which the students always use Digital devices To access learning resources (e.g., PowerPoint slides, pdfs) with mean (3.146). It can be described as " Great Extent " which defines as effective for their learning. These results agree with the study of Etcokleous and Kloridou (2009).

Column1	Indicator	Mean	Discriptive Rating
1	Having your own device in lectures is distracting.	2.239	Small Extent
2	Others using their own device in lectures for non-learning activities (e.g. chat in social media, shopping) distracting	2.571	Moderate Extent
3	make notes/or to take photos from lecturer's presentation	2.907	Moderate Extent

4	During lectures, I often miss important points because I am thinking of other things.	2.468	Small Extent
5	I am personally interested in the content of that lectures	3.132	Moderate Extent
6	For activities not directly related to your learning (e.g. chat with a friend,shopping, playing games)	2.332	Small Extent
7	To supplement lecture notes.	2.937	Moderate Extent
8	To access learning resources (e.g., PowerPoint slides, pdfs)	3.146	Great Extent
9	To complete assignments	3.371	Great Extent
10	To browse webpages related to lecture topic	3.210	Moderate Extent
11	To complete online tests/tasks (e.g., multiple-choice tests)	3.220	Moderate Extent
12	I begin my coursework earlier	2.790	Moderate Extent
13	When I study, I examine a range of information from different sources (websites, videos, textbooks, journals etc.).	3.024	Moderate Extent
14	When studying for this course, I often repeatedly go over the same course material to memorize it.	3.059	Moderate Extent
15	I think I will be able to use what I learn elsewhere in life.	3.137	Moderate Extent
16	I rarely find time to review my notes or readings.	2.590	Moderate Extent
17	I believe I will achieve a high grade this year.	3.107	Moderate Extent
18	I find it hard to stick to a study schedule.	2.707	Moderate Extent
19	Other things in my life tend to take priorty over study.	2.493	Moderate Extent
20	Sometimes I cannot motivate myself to study, even if I know I should.	2.848	Moderate Extent
	Over all mean	2.84	Fairly Great Extent

Table 4

The result showed that the indicator which got the Low mean(2.239) was, Having your own device in lectures is distracting. This figure consistently suggest that students rarely distract from others who use smarphones in

lectures room which can be described as “Small Extent”, meaning, students used Digital devices as effective for learning not for distracting other.

The result showed that the indicator which got the Moderate mean (3.137) was, I think I will be able to use what I learn elsewhere in life. This figure consistently suggest that Student belive what they should learn using digital devics, they can use in future or in real life efficiently in “Moderate Extent”, meaning, students used Digital devices as effective for learning will increase thinking level and problem solving approach.

The result showed that the indicator which got the Moderate mean (3.107) was I believe I will achieve a high grade this year. This figure consistently suggest that Students belive that using Digital devices then can improve their grade in academic in “Moderate Extent”, meaning, students used Digital devices as effective for learning will increase interest in studies.

The result showed that the indicator which got the Moderate mean (2.790) was, I begin my coursework earlier. This figure consistently suggest that Students use their Digital devices to start learning before The lectureres taught “Moderate Extent”, meaning, students used Digital devices as effective for learning will feel independent of professor. They start their learning as their own way.

Correlation Analysis of Digital devices Use as a Learning Tool and Academic Performance

Table 4. Correlation analysis of level of use of Digital devices as a learning tool and average grade of students.

Indicator	Correlation Coefficient	degree
Level of use of Digital devices as a learning tool	0.339	Positive
Study decreasing level of correlation	-0.250	Negative

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

Table 5

As shown in Table 5 correlation analysis of Digital devices use as a learning tool and academic performance showed statistical significance as indicated by r= 0.339; (p< 0.05). This means that use as a learning tool and academic performance of students are related to each other, The more the students used Digital devices as a learning tool, the more they improve their academic performance.

While r= -0.250; (p< 0.05). This means that the Digital devices use as a learning tool and academic performance of students are related to each other, but more the students distracting using Digital devices there is decrease in their academic performance.

Thus the hypothesis, stating that there is no significant relationship in the effects of Digital devices as a learning tool on the academic performance of students is rejected.

It agrees with the study of Pritchard (2009), it stated that it is "an individual's preferred means of acquiring knowledge and skills" and that it is "a person's typical approach to learning activities and problem solving".

Liu (2008) argued that it approaches to learning which refer to processed in a preferred way in accordance to learner's habitual characteristics. In addition, Sarasin (2006) described the level of use on Digital devices as a learning tool a certain specified pattern of behavior and/or performance according to which the individual approaches a learning experience.

Regression Analysis of Effects of Digital devices As a Learning Tool on the Average Grade

Regression analysis of effects of Digital devices as a learning tool on the average grade of students is mention on table6 & 7.

Regression Statistics	
Multiple R	0.105192
R Square	0.011065
Adjusted R Square	0.00617
Standard Error	1.326518
Observations	204

Table 6

	Coefficients	*Standard Error*	*t Stat*	*F*	*Significance F*
Intercept	3.089	0.207	14.904	2.260	0.134
2	0.124	0.082	1.503		

Table 7

Regression analysis generally allows this study to model, explain and examine the independent variable.

Table 6 shows the regression analysis of the effects of Digital devices as a learning tool on the average grade. As revealed in Table 6, the variable showed significant contribution to effects of Digital devices as a learning tool on the average grade. The effects of Digital devices as a learning tool on the average grade is t (1.503), ($p<0.05$), which indicates its significance at 0.05 level.

R^2, the measure of total variation of the independent variable, consists of 1.1% which reflects amount of the variance explained by effects of Digital devices as a learning tool on the average grade of students.

From the foregoing analysis, the equation to be used for the effects of

Digital devices as a learning tool on the average grade (Y), as indicated by the F- value (2.260) with its corresponding significant at level $p<0.05$.

This shows that 1% increase of the effects of Digital devices as a learning tool would mean 0.680 increase of the average grade of students. In the study of Steve (2000), it shows that the vast majority of students reported using the Digital devicess during class time to support their self learning.

In addition, all participants indicated that they used their mobile devices outside of the classroom to facilitate their learning. Clearly, the motivation to use the devices and opportunities to use the devices to learn were not the problem as students found ways to use them with in and outside of their classroom even when specific uses were not provided by instructors (Steve, 2000). Furthermore, there also appeared to be an important shift in the use of Digital devices as students started to see it more as a tool for learning than non-learning tasks.

Thus the hypothesis, stating that there is no effect of Digital devicess as a learning tool on the academic performance of students is rejected.

Findings

Findings revealed that level of used of Digital devices as a learning tool obtained an overall mean of 2.84 which can be described as "Fairly Great Extent," meaning, Digital devices is effective in improving the academic performance of students. It implies further that their level of used of Digital devices as a learning tool was effective in their learning.

It revealed that the academic performance of students obtained an overall mean of 87.35 which can be describe as "Great Extent", meaning. that the academic performance can be affected by the use Digital devices. It implies further that their academic performance was very satisfactory.

It was found on the correlation analysis of Digital devices use as a learning tool and academic performance of students are related to each other. The more the students used Digital devices as a learning tool, the more they improve their academic performance.

Findings revealed that the regression analysis of effects of Digital devices as a learning tool on the average grade showed the significant variable contribution to effects of Digital devices as a learning tool on the average grade.

Conclusion

- Based on the findings of the study, the following conclusions are drawn: Using Digital devices as a learning tool has a positive effect on the academic performance of students.

- Using Digital devices is effective in improving the academic performance of students.

- The study establishes that using Digital devices helped students improve their grammar, vocabulary, pronunciation and learning process, hence improving their classroom performance.

- The academic performance of the students of in terms of their grades was satisfactory.

- The use of Digital devices diverted students' attention in class and reduced their classroom participation.

- It establishes that a considered and intelligent use of Digital devices has more benefits than harm.

- It is recommended that students should be advised regarding use of Digital devices in various situations related to their academic progress.

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