Effect of Technology Distraction on Learning among Students in Higher Institutions in Central Nigeria

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ABSTRACT

Technology distraction is the diversion of attention from a goal, which is majorly due to the utilization of technological devices during this period. Most students are unable to control their time. In ascertaining the effects and reasons for these distractions, a survey was done within two Nigerian institutions. This research showed that a large number of students utilize technology and the internet where most of the users who use laptops use it more for learning activities. With p-values of 0.152 and 0.012, findings showed that there is not enough evidence to show a relationship between age and the level of distraction and Sex and the level of distraction respectively. Distractions also occur through non-technical devices but with technical devices, distraction tends to be more with portable devices.

Keywords

Technological distraction, E-learning, Mobile distraction, Higher education, Learning process.

1. INTRODUCTION

The use of ICT and other technological devices in learning has been highly publicized majorly because the average human being is seeking for the easiest way in achieving goals. The use of ICT in learning has been proven to ease the learning process. The Internet has a positive effect on both the teacher and the student in learning and interacting with each other and other people. This not only provides an environment for learning but an exciting, easy and cheap method for acquiring knowledge. [1], [2].

Devices linked to the Internet also provide easy access to a lot of other non-educational materials. When students take out a few minutes from the learning time to access other media, they do not realize the damage it does to their learning, as the process is continuous. Students feel the time taken is insignificant [3].

This research seeks to identify the level of distraction occasioned by the use of technology devices in institutions of higher learning using Bingham University Karu and University of Abuja as the case study.

2. DEFINITION OF DISTRACTION

Distraction refers to diversion of a person's or a group of peoples' attention from something of utmost importance to other less important or secondary tasks[4]. Over the years, distraction has, in most cases, been attributed to having a negative effect on people, although distraction is also a technique that has been proven to solve the challenge of managing pain. This method has been used in the treatment of various illnesses and terminal diseases including cancer[5], [6].

2.1 What Is Technology Distraction?

The Use of the internet in institutions of higher learning have very good advantages as it provides a very suitable environment for carrying out research by making articles, simulations readily available. Information to be shared between teachers and students can easily be sent [3]. The use of technology in education has been seen as a very good method for easing the learning process although, students' access to an uncontrolled environment can divert their attention from the important learning tools to other non-educational materials[7].

The ability for students to learn using modern technologies in learning and concentrate without getting distracted by other non learning tools depends solely on the focus of the individual [2].

A research survey done by CourseSmart and Wakefield in 2011 showed that 73% of students could not study without the use of modern technological devices[8]. The use of technological devices in learning is very important but a balance must be struck.

The Learning process:

- Need for attention: In the learning process attention is a very important factor. Attention is very important because key parts of the information to be given by the tutor might be lost. The learning process is a continuous process and if pieces of the puzzle are missing the puzzle can never be complete[9], [10].
- A complex process: Learning is the process of understanding, gaining knowledge and mastering a field of study to an extent in which the knowledge acquired can be transferred[11]. The ability of human beings to understand things improves with age according to Piaget's theory[12]. A research carried out by Clarks in 1993 showed that the learning process begins with several events especially when transformation is involved, thoughts and feelings are included making the process complicated[13].

There has been a lot of debate over the advantages and/or disadvantages of students using technology in the classroom. In the 70s/80s, the technologies used in the classroom include overhead projectors and flip charts. Today, most classrooms are smart classrooms and are often fitted with computers, laptops, smart podia, Blu - ray paper, HD projectors, Data

Projectors, DVD Players, sound speakers, document camera, and so on. [14]. Most students also bring IPods, IPads, and cell phone to the classroom. Although some students may use these technologies to take notes, interact with professors guide, reading the text material or following along with instructors, others use them for texting, emailing, surfing the web, on the Facebook, hulus, Netflix, YouTube, twitter, Skype etc. These students are often carried away by the use of these gadgets [15]. This study sets out to investigate the situation in Bingham University and University of Abuja and possibly suggest or find ways to ameliorate the problem. Because higher institutions have adopted the use of latest technology in the classroom almost every student brings their own smart devices into the classroom, many faculty are setting limits on the degree to which students use these technology [14], [16].

3. RESEARCH QUESTION

Technological distractions have various uses both positive and negative for which researchers have done work on both effects. Previous work done on the effects to learning demonstrated that technology can affect students positively and negatively. The previous work was mostly done in western countries, which might not be the case in other parts of the world including Africa. The major research question for this work is to get the effects of technological distractions on learning among university students. In answering this question the following sub-questions will be answered.

- Is there a difference in the effects of technology on the learning process in university based on demography?
- How do university students view the effects of technology to the learning process?
- Is there a difference between distractions from portable devices and distractions from computers?

4. RELATED WORKS

A study in Britain in 2011 showed that in every 10 students, social media and other sites at least distract nine once in every hour [3]. The age of students has also been seen as a contributing factor to the level of technological distraction. It has been observed from studies carried out that the older the person the less distracted the person would be [8], [17].

Table 1 Survey on technological distractions in Saudi Arabia [18]

Distraction	Percentage distracted
Cell phone ringing	67%
Texting	52%
Email/ surfing the web	42%
Video Games	59%
Mp3 players	44%

A 2017 research survey done by Attia et al. [18] in Saudi Arabia as shown in table 1 indicated that phone ringing is the most distracting event with technological devices followed by video games. Others are texting, music players and email/surfing the web.

A research was done in California by the University of California in 2011 on student's attitude and it was deduced that students can be divided into two groups: focused learners and people who multitask. The former are students who are not distracted at all during classes while people who multitask feel they can understand the lecture while visiting other sites and social media on their devices. This set of students are usually more interested in the information gotten from their devices than that from the tutor [3]

That students are being distracted when using technology in learning is not unrelated to a lack in their motivation to learn, confidence, self-direction and lack the skill and ability to identify valuable educational materials [2], [19].

5. STATEMENT OF PROBLEM

Most students spend so much time on phones, the internet and their laptops and are often not able to distinguish between quality content from unreliable sources, they are also being distracted by other contents like pops, advertisement and games on their computers or on the internet, they often tweet instead of thinking. In this study we try to identify the reasons and the adverse effects.

6. METHODOLOGY

In answering the research questions participant's views are collected and analyzed. Questionnaires were used because of its ability to obtain data from a large group of persons, which is important in obtaining a more appropriate result.

For the purpose of evaluating the effect of technology use on students, a sample size of 150 students was selected for the survey. The sample was selected from the computer Science department and also from the College of Medicine, University of Abuja and Bingham University, Karu, Nassarawa State. The participants run across the first to final year level of the undergraduate program in the department of Computer Science and College of Medicine.

6.1 Validation of Survey Questionnaire

For the purpose of validating the results of the survey and certifying that the questions and layout of the survey questionnaire was readable, understandable and properly laid out. A pre-test was administered to 20 students before the actual survey was done which mostly had to do with readjusting the tables to prevent confusion in responding to the questions.

6.2 Survey Questionnaire

The questionnaire consists of 33 questions aimed at getting the students' views about the pros and cons of utilization of technology in learning environments and having an insight into the level of harm technological distraction poses. The questionnaire is divided into portions that help in answering the research question.

These portions are:

- Do you have portable devices?
- Would you like to use them during educational activities?
- How often do you utilize these devices?
- How do these devices affect you when learning?
- How does the utilization of these devices by other people affect you during educational activities?
- The most distracting activity when utilizing these devices.

The 2nd to the 5th portion were done using a likert scale so as to provide a more accurate response to the questions.

7. RESULTS

The respondents from the survey were 112 out of 150 persons after filtering the properly completed questionnaires. The data was analyzed using SPSS 22. The responses to the questions

are qualitative and so comparative analysis was done using non-parametric techniques.

The following are the outcomes of the survey:

From the survey carried out 24.32% of the respondents were females while males were 75.68%.

The respondent's ages ranged from 16 to a maximum of 33years old. 3.03% of the respondents were 16years old, 9.09% were ages 17, 15.15% were ages 18, 20.20% were ages 19, 13.13% were aged 20, 8.08% were aged 21, 3.03% were aged 22, 6.06% were aged 23, 3.03 were aged 24, 2.02% were aged 25, 5.05% were aged 26 and 12.12% were between the ages of 27 and 33. On analyzing the survey, it was discovered that 13 respondents refused to indicate their ages.

Out of the 112 respondents 106(95.50%) have laptops while 5(4.50%) do not have laptops although, since the study also affects other forms of technological devices including portable devices the respondents were also asked if they had mobile phones/portable devices, 96.43% have while 3.57% do not have mobile/portable devices. 69.44% use a laptop for learning during lectures while 30.56% of them do not. On either a laptop or a mobile/portable device 87.39% of the respondents had access to the Internet while 12.61% do not.

A summary of the responses and how the respondents want to utilize technological devices during academic activities are given in table 2.

Table 2: Utilization of technological devices during academic activities

S/No.	Question	% Respondents that Strongly agree and agree
1	I want to be able to use my phone during lectures	37.83%
2	I would love to use my laptop to take notes	68.75%
3	I would like to record the lectures on my device	73.21%
4	I would like to use the internet during classes for activities not pertaining to the course	9.82%

The next section, which deals with how frequent technological devices are being used, is very vital and the respondent's responses to the survey questions are presented below.

Table 3 Frequency of technological device usage

S/No.	Question	% Respondents that indicated Very Often and Often
1	How often do you answer calls on your mobile phone	67.86%
2	How often do you check you phone for text messages	63.39%
3	How often do you read	70.91%
	your text messages	
4	How often do you write text messages	44.64%
5	How often do you read and reply emails	38.74%
6	How often do you surf the web	86.49%
7	How often do you listen to music	85.45%
8	How often do you read online news	58.18%
9	How often do you play games on the internet	18.35%
10	How often do you do other assignments on your computer	80.36

The following table shows responses to losing attention based on self-initiated actions or events.

Table 4 Loss of attention due to self-initiated actions

S/No.	Question	% Respondents that Strongly agree and agree
1	I am working on a PC during practical's	10.71%
2	I work with others during practical's	14.29%
3	The lecturer is lecturing	11.01%
4	The lecturer is tutoring during practical's	11.71%
5	I do my assignments at hostel	32.14%

After responding to losing attention based on self-initiated actions or events, it is also very important to identify reasons for loss of attention caused by others. The responses are represented in the table below.

Table 5 Loss of attention caused by others

S/No.	Question	% Respondents that Strongly agree and agree
1	When other students use their mobile devices	24.11%
2	When other students use their laptops to type notes	10.71%
3	When other students use their laptop to surf the web	17.86%

The most distracting phone related activity based on the respondents was 51.35% (phone ringing), 9.91% (talking on the phone), 2.70% (text messaging), 5.41% (browsing) and 30.63% (using social media). And 11.71% (surfing the internet), 0.90% (laptop users), 67.57% (playing computer games), 13.51% (listening to music) and 6.31% (noise from striking the keyboard) are the response from the respondents on distractions related to laptop activities.

The respondents also identified non-ICT related distractions of which 34.55% was by talking, 12.73% (late arrivals),

25.45% (non-course related activities) and 27.27% (not paying attention). The respondents when asked how technology affects learning 28.83% (it aids in the learning process), 1.80% (a big distraction), 68.47% (depends on how it is used) and 0.90% response was I don't know.

7.1 COMPARISON ANALYSIS RESULT

In determining factors and the effects of technological distractions in a learning environment the age of students were compared to the loss of attention due to the actions of others. The results showed that there is no linear relationship with a Pearson correlation value of -0.145 and a p-value of 0.152. Figure 1 also shows no definite pattern of a relationship between age and loss of attention due to the actions of others and hence no linear relationship exists.
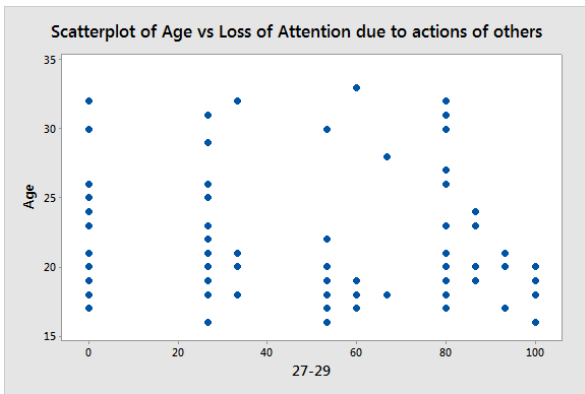

Figure 1 Age vs. Loss of attention due to actions of others

When the results for the analysis of how technology affects learning in relationship to the responses from females and those from males, the result showed that there is no difference between the responses of the males and that of the females.
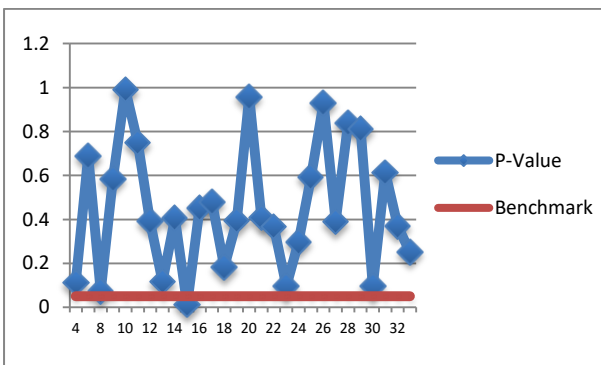

Figure 2 Summary of results whether responses differ based on sex

Figure 2 shows a summary of the responses with reference to gender. The red bar in figure 2 indicates the determining benchmark when a 95% confidence interval (0.05 significant level) is used.

The response to the survey questions 4 to 32 are analyzed to see if there exists a difference between the responses by the males and the responses by the females. The results as indicated in figure 2 show that only one of these questions had responses that differ between that from the males and that from the females. How often do you type text messages gave results with a p-value of 0.012 showing a difference between the responses of males and that of females. The results also showed that using a 95% confidence Interval (CI) we are

confident that there is a mean text messaging of females is between 0.121 and 0.911 higher than text messaging in males.

8. DISCUSSION

The survey shows that a large number of students own Laptops. In every 100 students 95 own laptops and approximately 96 own other portable devices showing a high rate of acceptance of modern technological devices and also high utilization of the Internet amongst the students of Bingham University and University of Abuja. Most students want to be able to use their computers for educational purposes especially for recording lectures and also in taking notes during lectures, but also want to use it for other things.

This research shows that distractions affiliated to technology such as gaming, social media, surfing the internet for unrelated information to the course being taught in the lecture halls and so on, are not gender sensitive although females type text messages more frequently than males, the overall research has no significant difference between the male and the female utilization of these devices and also difference in their levels of distraction.

The survey did not show any difference in the respondents' responses with reference to age. The age of the students does not affect the utilization and the distractions that are faced when they and others around them are using technological devices.

Distraction comes in so many ways, which might not necessarily be technological, these non-technological effects, which, large majorities have highlighted as talking, playing manual games, reading novels and other documents etc., and not paying attention as the cause.

Although the Internet is used for non-educational purposes but it is also highly utilized in the learning environment for solving and better understanding problems by its high utilization for finding solutions to assignments.

According to McCoy[20], 90% of student's advice against the ban of technological devices even in the midst of the distractions they may cause. These distractions are highly connected to self-control and that is what many find difficult to keep in check. The high frequency by which students respond to text messages and check for updates shows that staying off these devices especially portable devices is not so easy and poses a threat to full and undivided attention during learning.

Users of laptops tend to use laptops more for educational purpose more than they would use a phone or a portable device for the same purpose. These devices can be a source of distraction depending on how they are being used as it is also defined as a good tool for learning. The effect of technology depends largely on self-discipline, it is left to the user to decide how he controls the utilization and how it affects him, which could be either positive or negative. Laptops even with all the educational features that exist contains games, which provide some level of relaxation that most students utilize in keeping themselves busy, have also been identified as a major distraction.

9. RECOMMENDATIONS

The benefits associated with the use technology in learning far out-weigh the negative effects. To properly harness the benefits, the following recommendations are very important:

- There should be restriction on the use of portable devices while learning especially the use of mobile phones.
- There should be regular enlightenment about the effects of distractions and the damage they might cause during the learning process.
- Although the use of laptops posses some threat to the learning process but the positive effects outweighs the negative effects. The use of laptops should be encouraged with proper guidance.
- A research into methods of identifying relevant and irrelevant

10. CONCLUSION

Learning is a complex process that deals with acquiring skills, knowledge and understanding. Attention is key in learning and any missing part of the puzzle can cripple the process. Researches done in various countries on distractions of technology to the learning process have shown that it is of concern and has great effect on student's concentration and attention. However, studies have also shown that these technological devices can aid in improved learning depending on how they are used.

This study has shown that 51% are distracted from phone ringing which is the highest distraction identified amongst others. From the research done into the effects of Technological distractions in the learning process and the affected devices, students of institutions should be conscious about the effects and prevent it. The study also shows that levels of distractions is not based on gender or age, it is more on discipline and self-control. Portable devices have been proven to be highly distractive and also addictive and it is recommended that these devices be kept at a distance during learning. The positive effect in cognitive learning experience while using these devices is a research area we hope to look into in the future.

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