Inability to Access the Internet and its Effect on Students' Behavior inside the Computer Laboratory

FLORETO B. QUINITO, JR.
Professor, Department of Information Technology
University of Science and Technology of Southern Philippines
Jasaan Campus

Abstract

The study was conducted to fully understand the phenomenon of the perceived non-engaging behaviors during the conduct of laboratory activities among Bachelor of Science in Information Technology students of the University of Science and Technology of Southern Philippines - Jasaan Campus. The study aimed to identify the main trigger of such behaviors. Mixed methods were utilized in order to understand the problem. Survey questionnaires were distributed to the respondents and interviews were facilitated by the FGD to generate qualitative data. An observation log was used to record observed behavior. Data collected were analyzed using descriptive statistics. The study revealed that students were very dependent on the Internet for doing their assignments and other academic requirements. Students are more engaged in the computer laboratory if they have full access to the Internet. Students strongly agree that the performance of a wired computer laboratory provides better network connectivity than the wireless computer laboratory including better access to the Internet.

Keywords: Behavior, Internet Access, Local Area Network, Wireless

INTRODUCTION

Computers and Internet technology offer educational opportunities to both Higher Education Institutions (HEIs) and to many people who prefer the nontraditional higher education system. The method of

educating through textbook-oriented learning in a classroom has been partly replaced by the Internet (Njoku, 2015). For decades, HEIs have been utilizing the Internet not only in their classrooms but also in their day-to-day operations. Many countries see the Internet as a gateway for raising educational standards (Noor-UI-Amin, 2013). The role of the computer network has changed the paradigm of the methods of instruction across the globe. The availability of and access to information through the Internet has become the ultimate knowledge provider to many students and teachers. The simple implementation of the local area network (LAN), both wired and wireless, brought many benefits to the institutions in performing their processes, increasing their efficiency and productivity. People rely so much on the use of mobile devices that have become an integral part of their lives. But the blood stream of these devices is not the features they provide but the numerous network services the user enjoys, to which these devices are connected.

At a University of Science and Technology of Southern Philippines (USTSP) Jasaan Campus, Jasaan, Misamis Oriental, Philippines, where the author works as an Information Technology instructor, the Bachelor of Science in Information Technology (BSIT) students in Computer Networking classes display non-engaging behaviors, especially during the conduct of laboratory activities in the wireless computer laboratories. Many of the students are observed doing other things not relevant to the assigned laboratory activities. An inquiry was made of other teachers handling core subjects in BSIT, and they report observing similar behaviors by their students in the same computer laboratories.

The general aim of this study was to identify the main reason behind the non-engaging behavior of the BSIT students during laboratory activities. The study also aimed to enumerate the common non-engaging behaviors observed among the students and to determine appropriate intervention to change such behaviors.

REVIEW OF THE LITERATURE

ICT in Education

Parra (2012) claims that school is one of the venues where technology has had the greatest impact, which in turn has had an effect on the

role of the teacher and become a part of everyday school life. Nisar and Munir (2012) support such claims, stating that the availability and usage of Information and Communication Technologies (ICT) is essential to improving the educational efficiency of students because these technologies have become integral to the lives of today's tertiary student (Aguilar, 2012). The use of ICT in education lends itself to more student-centered learning settings and further improves the educational quality of the student, revolutionizing the way information is obtained, managed and interpreted (Aguilar, 2012).

On the other hand, Chen, Lambert, and Guidry (2008) conclude in their study that there is a positive relationship between the use of web-based learning technology and student engagement and desirable learning outcomes. The integration of ICT into education has become a process whose implications go far beyond the technological tools nurturing the educational environment. The ideas of teaching construction and the ways one can build and consolidate meaningful learning based on technology, or the technological use of education, are now being discussed in strictly pedagogical terms (Díaz-Barriga, 2013). Chen, Lambert, and Guidry (2008) further point out that not only do students who utilize the Web and Internet technologies in their learning tend to score higher in the traditional student engagement measures (e.g., level of academic challenge, active and collaborative learning, student-faculty interaction, supportive campus environment). They also are more likely to make use of deep approaches to learning, such as higher-order thinking, reflective learning, and integrative learning, in their study. Moreover, they report higher gains in general education, practical competence, and personal and social development (Chen et al., 2008).

Today, there is a significant increase in numbers of HEIs offering courses using mobile wireless technologies as alternative teaching and learning tools (Kim, Mims, & Holmes, 2006). In the United States, most first-year college students arrive on campus with their own personal computer and other mobile digital devices (Salaway, Caruso & Nelson, 2008).

Internet Use in Tertiary Education
The Internet and its services play an important role in student's academic performance (Emeka & Nyeche, 2016). They are a priceless

source of information for students and a tool to enhance their productivity (Jones, 2002; Metzger, Flanagin, & Zwarun 2003; Kirschner & Karpinski, 2010). The Internet provides an activation of sight, sound, and cognitive reasoning, engaging students as active learners (Baker, 2000). Students are the most frequent users of the Internet (Jones, 2002; Choi, Son, Park, Han, Kim, Lee, & Gwak, 2009; Ni, Yan, Chen, & Liu, 2009; Judd & Kennedy 2010), and they use the Internet for educational purposes rather than entertainment (Kumar & Kaur, 2006). Kuh and Hu (2001) found that using the Internet has a strong relationship with an overall measure of student engagement inside the classroom. The Internet's use for study purposes has direct effect on students' academic performance (Emeka & Nyeche, 2016; Brown, Ellore, & Niranjan, 2014). Young (2006) argued that only the students with better academic grades spend more time on the Internet than others.

In their study, Mashra, Yadav, and Bisht (2005) state that students use the Internet for the purpose of preparing their assignments. The study of Liard and Kuh (2004) relates to the use of data in the National Survey of Students' Engagement (NSSE) at Indiana University Bloomington. They investigated the relationship between students use of the Internet and other forms of student engagement and found a strong positive relationship between using the Internet for educational practices, such as active and collaborative learning, and student-faculty interaction. Benefits to the academic community of using the Internet include: 1) quick, global, and convenient access and exchange of information with experienced experts in any field; 2) easy dissemination of research findings; 3) enhanced collaborative research and other activities; 4) ability to use some software and expand one's competencies; and 5) increased communication with classmates and professors, access to libraries and educational databases, and improvement in study hours and study habits. (Suhail & Bargees, 2006; Chiwepa, 2003; Jagboro, 2003). But despite this modernization of education systems, Whattananarong (2002) argues that there is no significant difference between the Internet-based system and the traditional system. The teacher's role that changes for Internet-based instruction did not change the learning outcomes of the students (Whattananarong, 2002).

Negative Effects of Internet to Students

Despite the positive impact of the Internet on academic performance, research findings show that excessive Internet usage adversely affects one's physical health, family life, and academic performance (Akhter, 2013). Academic-related problems include decline in study habits, drastic drop in grades, missing classes, and poor integration in extracurricular activities. Chou and Hsiao (2000) defined Internet addiction as an individual's inability to control his or her use of the Internet, which eventually causes psychological, social, school, and/or work difficulties in a person's life. Addiction to social oriented Internet use can affect a student's academic performance negatively (Brown, Ellore & Niranjan, 2014). Akhter (2013) found that academic problems caused by the Internet addiction include decline in study habits, drastic drop in grades, missing classes, and poor integration in extracurricular activities. Moreover, some college students seem to suffer adverse impacts on their academic performance due to socially oriented Internet utilization. According to Paul, Baker, and Cochran (2012) the time spent on online social networks poses significant negative impact on student academic performance. Kirschner and Karpinski (2010) further support this view, saying that excess involvement or obsession with social networking by students can have negatively impact on academic performance. Excessive Internet use has been associated with problems with performing daily routines, academic performance, and family relationships (Rickert, 2001). Also, studies associate social and recreational use of the Internet with lower academic achievement (Kim, 2011).

METHODOLOGY

Research Design

This study utilized the mixed-methods technique by collecting both quantitative and qualitative data through observations, surveys, and interviews. This approach will best conform to the research problems. The 55 randomly selected participants, third- and fourth-year BSIT students, took the survey. An interview in Focus Group Discussions (FGD) of randomly selected students was facilitated to validate individual responses from the pre-intervention survey. A separate

interview with five Information Technology teachers was conducted to confirm the observed non-engaging behavior of the students.

The assumed improvement in the students' behavior with their active engagement in laboratory activities was analyzed using methodological triangulation because the study explored the reasons for the observed non-engaging behavior of students in their laboratory activities and compared the data with that from other sources.

Sampling

Using the purposive sampling technique, the researcher invited 55 BSIT students; 15 from the 3rd-year level and 40 from the 4th year level. The researcher selected the students from the higher level because these groups displayed the observed non-engaging behaviors. These students were requested to participate in the survey and 25 of these participants were asked to compose the FGD. Five teachers handling BSIT core subjects were also requested to participate in the interview. These teachers have at least two semesters teaching experience in the campus.

Data Collection

Among all activities conducted in all computer laboratories, the researcher observed that the students were less engaged in the activities in the two wireless laboratories. The students were reluctant and less active in performing the given tasks. The researcher informally interviewed a few selected students, who admitted that the connectivity issues of the wireless computer laboratories hinder their learning activities and affect their behavior toward the subject. Aware of the situation, this study inquired of other teachers using the same laboratories if they had observed the same behavior. The teachers confirmed the same observation. The researcher then designed a pre-intervention survey and floated it to the students.

To validate the participants' response to the observation and pre-intervention survey, this study organized and facilitated an FGD with 20 participants, conducted in the computer laboratory. The interview focused on asking the participants about their experiences with the wireless laboratory and if such experience has any effects on their behavior toward laboratory activities. Based on the data

gathered from the FGD, the researcher reflected on an intervention strategy aimed at changing their behavior toward engagement in laboratory activities.

The whole process started with an observation last school year, from June 2017 to March 2018, of students' non-engaging behavior toward participation in laboratory activities. In this phase, the study conducted series of laboratory activities and the researcher observed carefully and recorded the observations from the start of the period until the activity was finished. The recording of observations took eight laboratory meetings (one laboratory meeting per week). The researcher formulated simple questions for the FGD to guide the discussion and conducted a series of tests to identify the actual performance of the computer laboratory, to fully understand the phenomenon.

The researcher consolidated all observations from the observation logbook gathered from the eight laboratory meetings, then identified three non-engaging student behaviors observed. These observed patterns served as inputs in the guides questions for the FGD interview. Using the guided questions, randomly selected participants were interviewed and joined the open discussion with the FGD.

Data Analysis

From the mixed methods used in the study, the researcher derived the quantitative and qualitative data. Common and notable remarks from the participants were collated and interpreted. The researcher analyzed and described the quantitative data collected using the graphical features of spreadsheet software to compute and visualize the average weekly percentage of the observed non-engaging behaviors.

RESULTS

An interesting disclosure from the survey and responses from the FGD participants revealed that the students dwell on these non-engaging behaviors during computer laboratory activities because of network connectivity issues in the wireless laboratory. The students tend to do other activities inside the laboratory in the breach of

network-connectivity failure. Some students performed these non-engaging behaviors one after the other. The study identified three prominent non-engaging behaviors:

> Doing other activities with their mobile devices;
> Doing other activities with their assigned computer; and
> Talking with their seat mates.

Figure 1 below shows the average weekly percentage of students observed in non-engaging behaviors. Students *doing other activities with their mobile devices* was the most prominent, while students *talking with their seat mates* was the least.
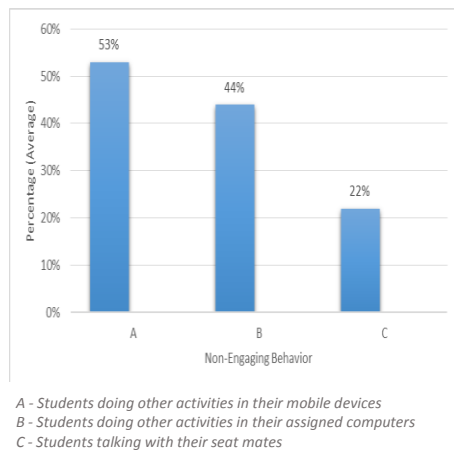

A - Students doing other activities in their mobile devices
B - Students doing other activities in their assigned computers
C - Students talking with their seat mates

Fig. 1. Average weekly percentage of observed non-engaging behavior

The FGD participants agreed that the performance of the wireless computer laboratory was not acceptable. Collective notable remarks from the participants are the following:

> *"Dili ko ka-focus sa ako pagtuon kay limited ra kaayo ang makaconnect sa network."* (I cannot focus in my learning activity due to the limited network connectivity.)
> *"Gakamang ang Internet, makawala sa gana."* (The Internet connection is very slow. I am losing my interest.)
> *"Sir, naa mi gusto i-search sa Google pero dili namo gakahuman tungod kay hinay ug gakawala ang network connection."* (Sir, we need to search something in Google but we cannot do it because the network is so slow and sometimes it is not available.)
> *"Dili mi makapasa sa amo assignment ug uban nga mga lab activities online kay hinay kaayo ang network."* (We cannot submit our

assignments and other laboratory activities online due to the poor network connectivity.)

"Gakalimitahan amo output sa lab Sir kay dili kaayo namo ma-access ang online resources." (Sir, our output is limited because we were unable to access the online resources.)

"Naay times nga dili jud ko makasulod sa network, mao na wala ko'y saktong output." (There are times that I cannot access the network, that is why I don't have good output.)

Overall, the FGD participants "Strongly Agree" that the current (wireless) network set-up of the computer laboratory must be changed. Their non-engaging behaviors observed during laboratory activities became their alternative activities whenever they encountered the network connectivity issues in the current (wireless) computer laboratory.

Intervention Strategy

To purposefully address the phenomenon, the researcher recommended to the school administration the reconfiguration of the wireless laboratory. In the summer of 2018 (from April to May 2018), the two wireless laboratories were reconfigured. The wireless local area network adapters of each desktop computer in the laboratory were removed and replaced by the Cat5 UTP cables connected to the built-in LAN card of each computer. The Cat5 UTP cables were connected to an intermediary network device, a switch. The new wired computer laboratory was first utilized during the first semester of School Year 2018-2019.

The appropriate intervention effectively addressed the non-engaging behaviors of the students. The network connection performance of the wired computer network is better in terms of speed and connection stability. In the implementation of the wired computer laboratory, the students were observed during their laboratory activities for four weeks (one meeting per week). The observation log shows a dramatic decrease in non-engaging student behavior: 41% decrease in *students doing other activities with their mobile devices*; a decrease of 36% in *students doing other activities with their assigned computer*; and a slight decrease of 4% in students *talking with their seat mates*. This study found that the significant change in the decrease in non-engaging behaviors of the students was due to their

dependency on the Internet. This result is supported by the findings of Khu and Hu (2001) that using the Internet has a strong relationship with an overall measure of student engagement. Figure 2 shows the average percentage change in non-engaging behaviors of the students' after the introduction of the intervention.
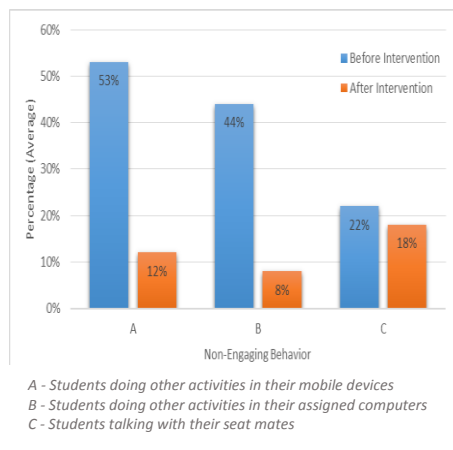

A - Students doing other activities in their mobile devices
B - Students doing other activities in their assigned computers
C - Students talking with their seat mates

Fig. 2.
Percentage of non-engaging behavior before and after the intervention

Individual remarks from the participants pointed to only one reason, i.e., the connection to the Internet. Common and notable remarks are the following:

       "Dili na mi laayon kung mag laboratory mi Sir, kay gakalingaw na mi ug browse-browse." (We will not get bored doing our laboratory activities because we find it enjoyable doing Internet browsing.)

       "Wala nay disconnection ang network, dako na mi ug agi, Sir." (We do not experience network disconnection anymore, definitely we will have better output, Sir.)

       "Di mi kabantay sa oras nga human na amo klase sa sobra ka-busy mag-download ug mag-browse sa Interne.t" (We don't notice that it is already the end of our period because we got busy downloading and browsing.)

       "Sir, wala na mi rason nga dili namo ma-submit sa deadline amo assignments ug projects." (Sir, we don't have any alibi not to submit on deadlines our assignments and projects.)

"Learning is fun with faster network connection."

"Sayun ug paspas na kaayo namo ma-access ang mga learning materials nga naa sa web." (It is now easier and faster for us to access the learning materials available on the web.)

"Grabe ka paspas ang speed sa computer lab karon." (The speed of the computer laboratory is very fast.)

"Daghan mi mabuhat nga assignments, activities and projects kay tungod accessible na ang network, Sir." (We can now finish more assignments, activities and projects because of our access to the network.)

"Dali ra mi maka-search ug download sa Internet sa amo kinahanglan." (It is faster to search and download things we need from the Internet.)

The result of the survey shows that the participants "Strongly Agree" that the performance of the wired computer laboratory is acceptable. This result shows that a wired local area network exceeds the wireless local area network in terms of speed (Shukla, Meghana, Manjunath, & Santosh, 2017; Hollenbeck, 2001), bandwidth (Khayat, 2002; Crow, Widjaja, Kim, & Sakai, 1997) and reliability (Vijayarani, 2015; Deotare, Wani, & Shelke, 2014).

CONCLUSION

This study concluded that the BSIT students of USTSP–Jasaan Campus were very dependent on the Internet in producing their assignments, projects, and other academic requirements. Such dependency has major consequences whenever the Internet is not accessible inside the school premises. The inaccessibility of the Internet inside the classroom or computer laboratory leads students into non-engaging behaviors during class and laboratory activities. Students tend to do other activities with their mobile devices or their assigned computers. They also tend to talk with their seatmates. Such behaviors limit academic outputs of the students, thus affecting their overall academic performance. This study also manifests the advantage of a wired Local Area Network (LAN) over wireless LAN in terms of network connectivity and speed. The students strongly agree that the performance of the wired computer laboratory is quite acceptable. The accessibility of the online resources and connection to

the Internet engaged the students in their class and computer-laboratory activities.

RECOMMENDATIONS

Today's tertiary students rely so much on the Internet for accomplishing their academic requirements. The Internet has become an integral part of students' academic routines as well as their scholastic performance. Hence, this study recommends that Internet should be accessible on school premises, especially in the libraries. Moreover, it should be not only accessible, but with acceptable speed and reliable Quality of Service (QoS). Wireless access of Internet through an access point inside the school has considerable limitations. As the number of wireless devices that connect to the network increases, the speed of the wireless network decreases. The institutions must see to it that the network set up, either wireless or wired, is appropriate for its purpose to avoid compromising speed and the QoS. The institution should allocate and manage bandwidth properly in order to optimize the use and distribution of Internet data inside the school premises.

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