

# Perception of Students in using Smart Phones for Educational Purposes

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**Abstract:** A change in technology provided the birth of high speed internet access and its availability has opened several new avenues for learning activity worldwide on recently evolved smart phones. The reasons behind are due to their enhanced features such as computing power, increased storage capacity, attractive interface, Wi-Fi connectivity and upload capabilities. The growing popularity of these smart phones among the youth can potentially revolutionize the way they learn. Needs and expectations of the society are changing very fast and the quality of higher education requires to be sustained at the desired level. The purpose of this study is to explore on smart phones and the use of the smart phone in Engineering Education during learning activity as a tool to find information by the students. This paper discusses the Perception of Students in Using Smart Phones in engineering education. The survey was carried out on 85 engineering students (both Degree and Diploma level) through questionnaire at INTI International University, Malaysia. The result showed the positive potentials and capabilities of the smart phones used in the engineering education. This indicates that engineering education could advantage from utilizing these new technological tools. Also this paper presents both opportunities and limitations for incorporating smart phones in engineering education learning environments.

**Keywords:** high speed internet, smart phone, engineering education, learning activity.

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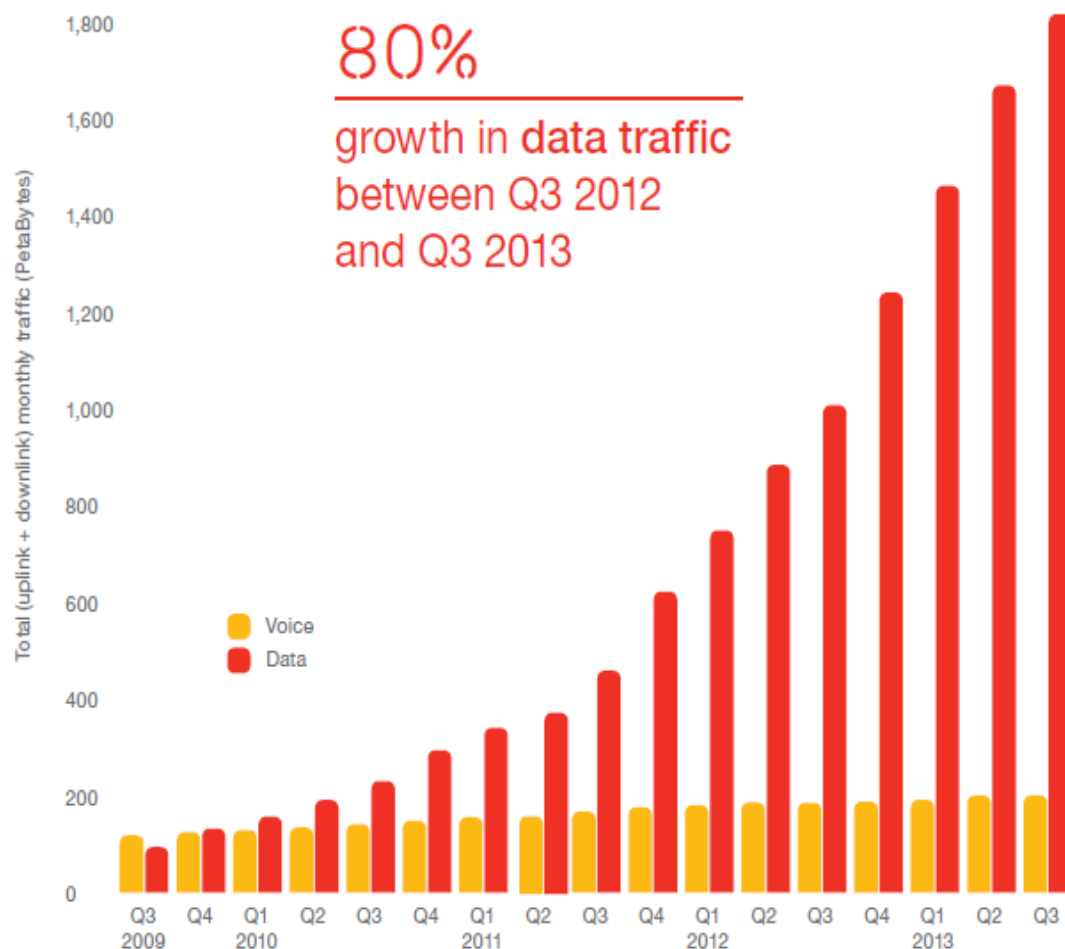
## 1. Introduction

In recent years, due to the fast growth of wireless and advances in electronic learning technologies, mobile device/smart phone learning became an enormous impact on our learning activities. The widely used wireless mobile communication devices with the portability and connectivity functions, teaching and learning activities can be transformed from traditional methods into e-learning or mobile learning. The internet technologies and the smart phone leads to the mobile learning and can be realized independently of time and place. Hence with the development of smart phone technologies, the educators teaching and students' learning activities in higher institution in engineering education can be initiated for lectures, quiz and assignments etc. Using mobile learning environment gives learners an opportunity to access the information whenever and wherever they want. Therefore, mobile devices which are sometimes criticized as one of the learning tools and which are developing in extend of size and features have recently been used intensively and they have increased the effectiveness of learning environments. To adopt mobile technologies simply as a means rather than a target while preparing plans and programs will provide more effective usage. In order to get the benefit of mobile devices, the first thing that should be done is to have one. Thus, along with obtaining these devices easily through some institutions and companies, getting a place in the culture shows that mobile learning applications can be applied to a wide mass. There have been many researches on distance education, e-learning and mobile learning for years. These researches have concluded that these kinds of learning have supported learning, increased the interaction and contributed to the persistency in learning; however, it has also been concluded that it is on its own, never adequate for learning.

## 2. Literature review

The student's user number of smart phones is increasing especially in higher education institutions. According to Apple, 63% of all students enrolled in colleges and universities own smart phones. College students are the fastest growing sector of the market expected growth for 2011 and it is almost 50%. This device can be positively used by educators in classrooms as a teaching and learning tool. This is true for the use of smart phones in education in general and especially for its use in teaching and learning activity in engineering education. On the other hand, this provides new possibilities, opportunities and challenges for the engineering educational environment. The researches show that the data transferred through mobile networks have increased dramatically. This increase in data transferring points out that people are using mobile technologies more often and they usually prefer to use these environments in order to access information. In Fig. 1, the uploading and downloading traffic in mobile devices can be seen clearly. The number

of mobile data subscriptions is increasing rapidly, and driving growth in data traffic along with a continuous increase in the average data volume per subscription. Data traffic (Q3) grew around 10 percent from 2012 to 2013.



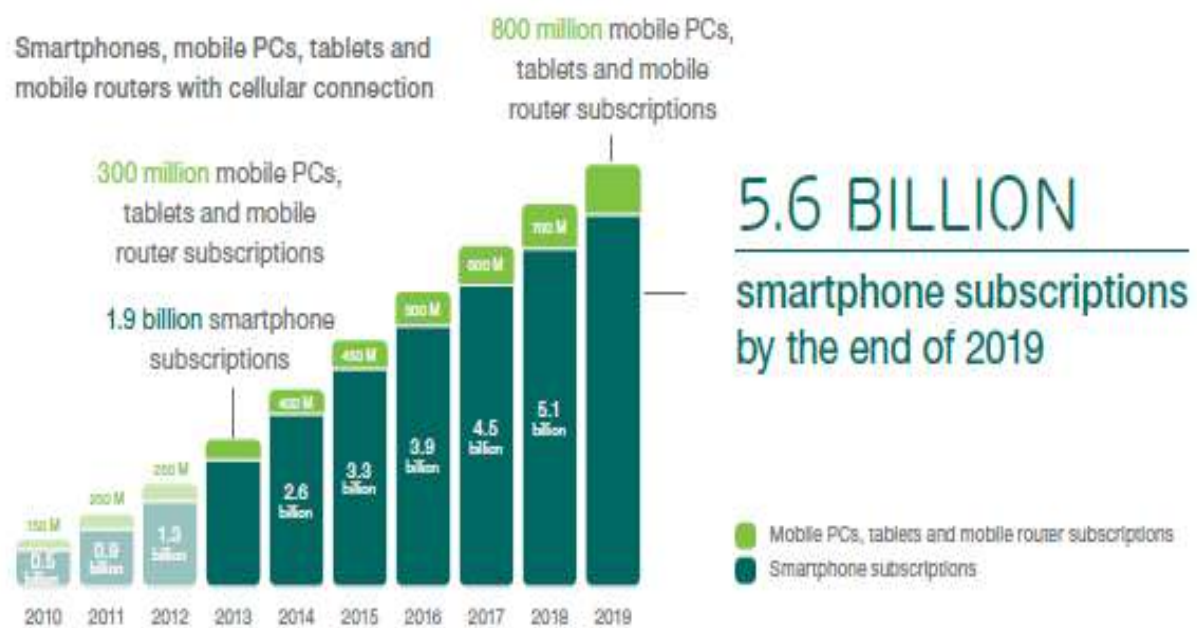
**Figure 1: 2009-2013 Global Traffic in Mobile Networks (Ericsson, 2013)**

In our modern life, it is possible to outline the mobile devices used in mobile learning as the following:

**Laptop:** Laptops and another kind of it, known as notebooks, are some of the portable devices that are mostly used in our daily life. These laptops can have all the properties of a normal PC. Due to being manufactured through advanced technology, being made up of valuable pieces of this technology, and their difficulty during installation, their cost is quite high. These laptops enable users to obtain the information they want by means of such wireless connection types as USB, wireless network, Bluetooth and infrared devices independent from time and place.

- i. **Tablet PC:** Tablet PC is the most popular computer of our time which is a portable personal computer typically smaller than a notebook computer but larger than a smart phone, and it is easy to transfer the data by means of its internet and memory device. It is a kind of computer usually having 7 or 10.1 inch-touch screen.
- ii. **Personal Digital Assistant (PDA):** Personal Digital Assistant, also known as palmtop computer, is a mobile device that functions as a personal information manager such as keeping addresses or names. It has the ability to connect to the internet and, it is also portable. With the developments in electronics and computer technology, the size of computers has become smaller and features of them have increased. The production of computers having the features of camera, video and GPS have expanded, but it has also started to give its place to smart phones.
- iii. **Smart Phone:** Smartphone as a mobile phone that offers advanced capabilities such as Web access and e-mail; runs complete operating system software and can run various “apps” created by third parties; and features a larger screen and faster processor than standard mobile phones. It is also a kind of communication device that has been designed by adding the features of PDA. Due to the fact that smart phones have mobile operating system and many

applications, they are very common devices used actively in all areas for different purposes. Today's information workers demand the flexibility to balance work, home and leisure. The smart phones enable them to lead the 21 century lifestyle. These days' smart phones are being used primarily by consumers in the youth segment who love to access the web, interact through virtual social networks, receive and compose email instantly, check the news and even use utilities such as the GPS navigation as a lifestyle choice. Wi-Fi connectivity helps to connect the internet via the hotspots when users are at the airport or other important public places. HD video player allows watching movies with high clarity. The popularity of smart phones has created a wave in development of mobile friendly websites. More than 100 million people actively use Facebook from their mobile devices every month [1] whereas mobile browser opera mini has more than 90 million users [2]. Just a few years back, smart phones were more of a status symbol, but now they have become a must-have productivity aid, literally carrying a lot of information all in pocket. As it can be seen from the Fig. 2, the number of smart phone users is increasing day by day. Total smart phone subscriptions predicted to reach 1.9 billion at the end of 2013 and are expected to grow to 5.6 billion in 2019 [3]. One of the main reasons for this is a notable increase in Asia Pacific and Middle East and Africa subscriptions, as people will be likely to exchange their basic phones for smart phones. This is due in part to the availability of smart phones in lower price ranges.



**Figure 2: Smartphone, PC, Mobile Routers and Tablet Subscriptions with Cellular Connection 2010-2019 (Ericsson, 2013)**

Some recent studies of authors [4] have found that by using mobile phones may represent new learning opportunities in higher education. Authors in [5] mobile wireless network or service in mobile wireless devices in classroom, students can access network information anytime, anywhere. This implies a new era for smart phone users, where integration of smart phones use in engineering lecture classes. The students are asked to use the smart phones to find appropriate details to respond to oral communication task given in classroom. By using smart phones devices in authentic learning, it changes the learning environment from the traditional way of learning by using notes and books to mediated educational activities which allow the students to integrate real life situations where learning can occur. This is because the authentic materials accessed using smart phones provide students with input for natural language use. The Mobile learning can guide a learner to an authentic learning context and incorporate the field objects with closely related information in the handheld device to initiate the process of knowledge acquisition [6]. In our research, we want to study the students' perceptions in adopting smart phones as a tool in finding related details to present their oral presentation input in the class. Their knowledge acquisition is initiated during which they use their smart phones to find points for the assigned activity. The students find it easy and pervasive access to information using technologies become trends in learning, and encourage educators to take a careful look at the ways we can best serve learners to cater to their needs [7]. In the second decade of the 21st century, smart phones offer the greatest potential for such invisible integration of technological hardware into engineering education learning. These devices are technologically superior to standard mobile phones, running on advanced operating systems such as iOS (Apple), Android (Google) and Symbian (Nokia) which allow for the use of high-resolution touch-screen interfaces and smart phone-specific applications. As the students are using the smart phones widely at a relatively low-cost [7], these characteristics mean that smart phones have the potential to become important device in engineering education learning in the case of this

study to enhance their oral presentation. It is possible to see in Figure 2 that the use of mobile devices has been widespread particularly in recent years. It is thought that however much mobile technologies and devices improve, it is not possible to get to the expected performance and success as long as they are not used in learning environments depending on the theoretical base. Therefore, the design of mobile learning environments and environment becomes more of an issue.

### 3. Methodology

The research aims to find out the extent to which students are harnessing use of smart phones/smart phone technology autonomously to support their learning and how his/her manifests it. In this work the data has been collected by conducting the survey through questionnaire of student's perceptions about mobile/ smart phones use for engineering education learning activity. This is carried out using two levels (Degree and Diploma) of engineering students at INTI International University Malaysia. The proposed plan is to obtain sample representative population from the INTI students and be able to use it for different quantitative and qualitative data generation from the perceptions of the target population. The objective is to have though understanding of what the current situation is with respect to smart phones/software/apps and how students currently exploit them for learning in different engineering education learning activities. This provides the information on the needs of student's requirement in terms of academic mobile support system. To analyze the data, statistical methods were used to quantify the collected data. Additionally, findings from the survey were analyzed and discussed for further interpretations and recommendations.

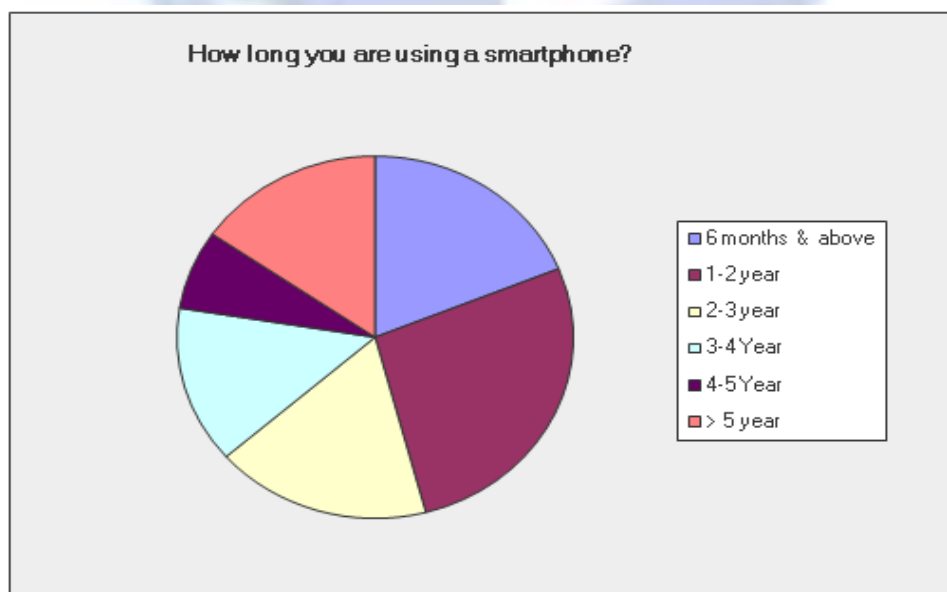
### 4. Results and analysis

The survey on questionnaire was set with the title bearing the heading as, "Use of smart phones in education by the students",

The data collection was focused towards engineering students between the age of 18-26 years. The survey had eight(8)questionnaires, which were length of use of smart phone, usage in the time of the day, is useful with social media to connect and communicate, frequency of usage to access lecture notes and other subject related topics, find more interest and fun than traditional methods of studying, have 24 –hour interne connection with your smart phone, currently studying program/course, and current level of study. The responses are received from 85 students. The results and analysis of responses for each question will be discussed separately in the following:

#### A. How long you are using a smart phone?

The question is aimed to estimate the progress on use of smart phones/ mobile devices by the students. The results obtained for question 1 are shown in Fig. 3



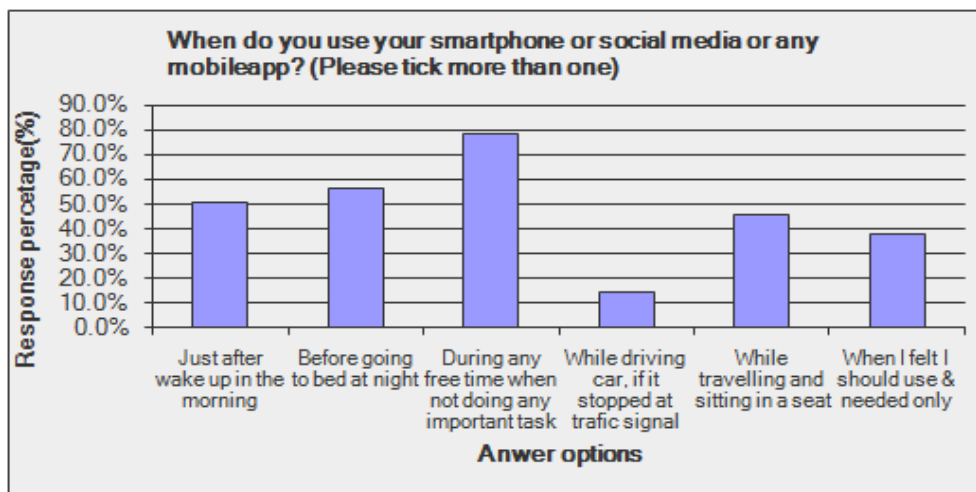
**Figure 3. Results of question 1**

The question is answered by 100% of students. The results obtained are shown in Figure 3. It is observed that the use of smart phones is spread over the years and is maximum (27.1%) during last 1-2 years and minimum (7.1%) during last 4-5 years. Therefore, the use of mobile/ smart phones is increasing by the engineering students as the years pass through.



**B. When do you use your smart phone or social media or any mobile app?(Please tick more than one)**

This question is aimed to draw the information on the time of interaction with mobile/ smart phone while passing through the various activities of the life during the time of the day. The choice was given chose more than one option. The results obtained for question 2 are shown in Fig. 4. The question is answered by 100% of students.

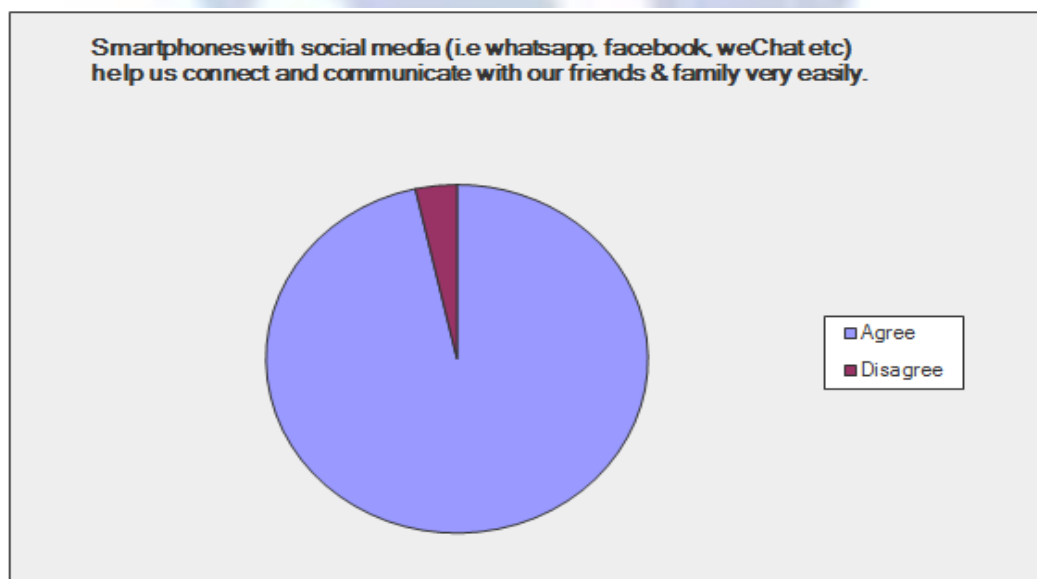


**Figure 4. Results of question 2**

The results on observation of question 2 from Fig. 4, the results are spread minimum of 14.1% to maximum of 78.8%, most of them are using their free time or after completion of important assignments of the day. Minimum % shows that the user are able to find time only driving or stopped at traffic signal, this shows that may his/her hobby or may be having busy schedules of the days. The total responses became 241, as the question given a choice to chose more than one option, preferred to obtain the various times of the day of users.

**C. Smart phones with social media (i.e whatsapp, facebook, weChat etc.) help us to connect and communicate with our friends and family very easily.**

This question is set to know the opinion of students how far it is helpful to the user in daily activities of life. The results obtained for question 3 are shown in Fig. 5. The question is answered by 100% of students.

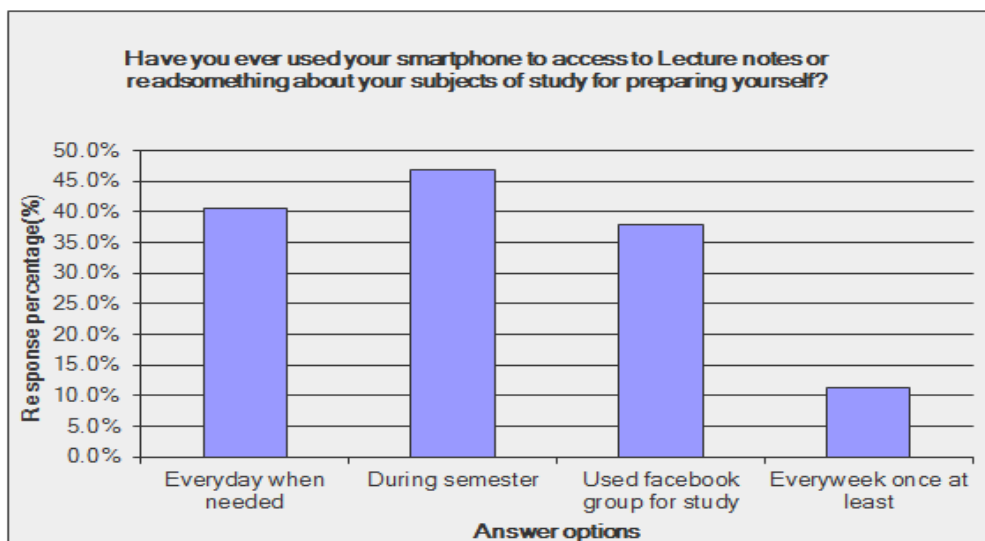


**Figure 5. Results of question 3**

The results shown in Fig.5, clearly indicates that the smart phone devices are use full in day to day life of students/user about 96.5% for communication. Only 3.5% of responses are disagreed the help of smart phone in day to day life. This is very small and may not be required to take into account.

**D. Have you ever used your smart phone to access to lecture notes or read something about your subjects of study for preparing yourself?**

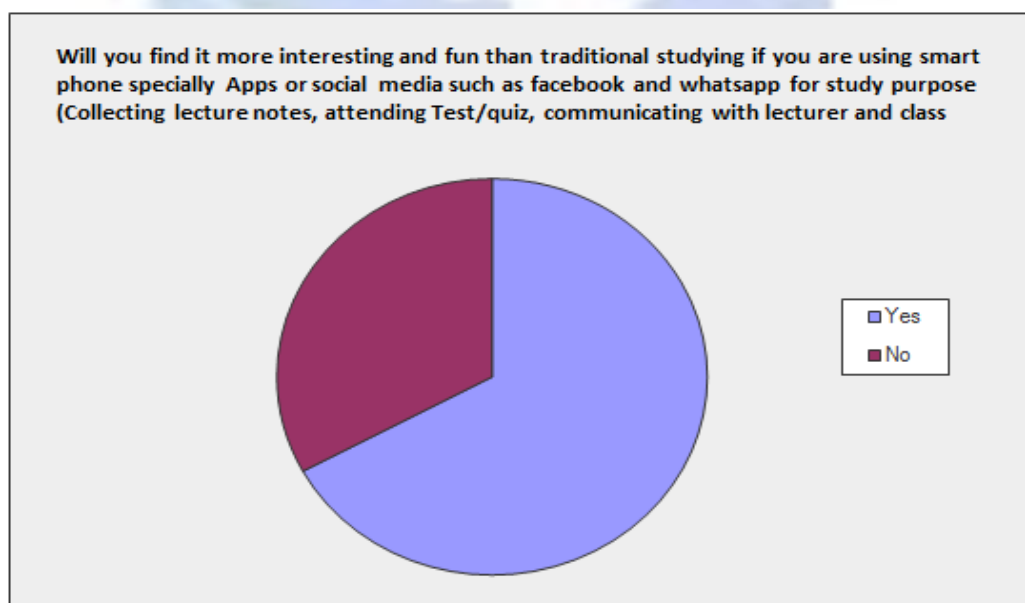
This question is aimed to know how many students are using smart phones for their education purposes. From Fig. 6, it is observed that students are using more time (46.8%) during run time of semester and about (40.5%) every day for their study purposes. Also 38% of responses for their group study through face book and once in a week 11.4%. Out of 85 students responses received from 79 students and 6 students not taken part.



**Figure 6. Results of question**

**E. Will you find it more interesting and fun than traditional studying if you are using smart phone specially Apps or social media such as facebook and whatsapp for study purpose(Collecting lecture notes, attending Test/quiz, communicating with lecturer and class mates)?**

The question is used to draw the opinion (comfort-ability) of students on use of smart phones for their study purpose. The results obtained for question 5 is shown in Fig.7 and the question is answered by 92.94% of students.

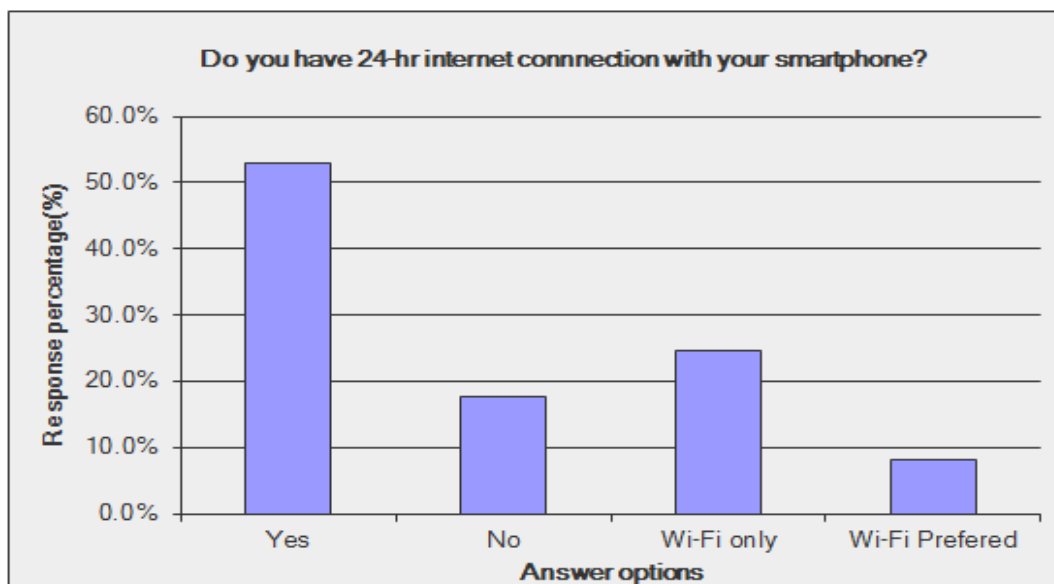


**Figure 7. Results of question 5**

The result obtained from Fig. 7, it is understood that 67.1 % of students are expressed that smart phones with social media is easy of study than traditional methods, but 1/3 rd of students (32.9%) are preferring traditional methods of study.

#### **F. Do you have 24-hour internet connection with your smart phone?**

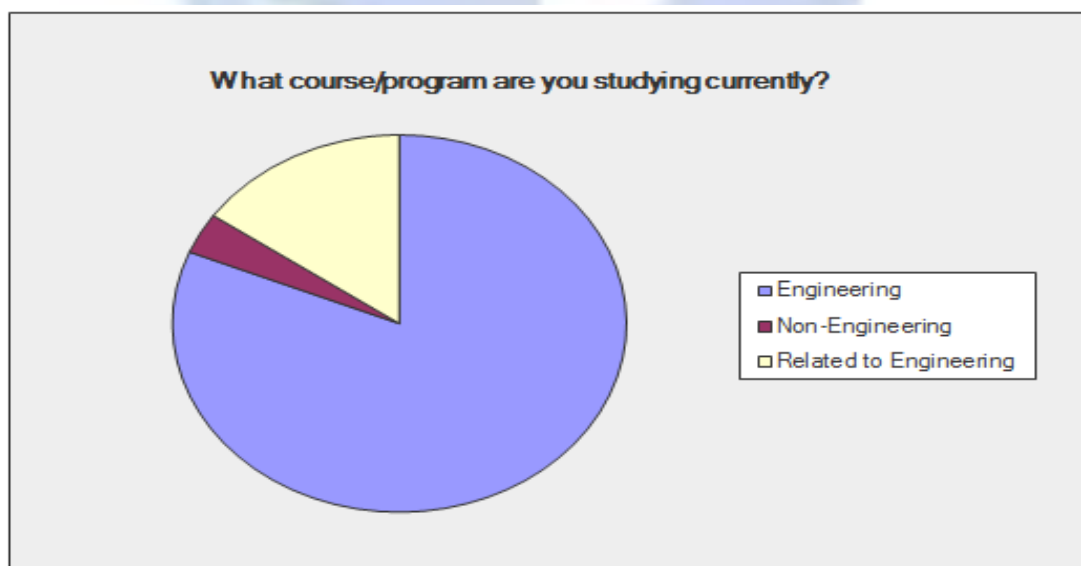
The question is to find out the status on availability of internet accesses facility to the students/users. The results obtained for question 6 are shown in Fig. 8. The question is answered by 92.94% of students. The result obtained from Figure 6 it is observed that 77.6% of response (66 students out of 85) had connection either of internet or Wi-Fi for use of smart accesses. The Wi-Fi connection is preferred by 8.2% of responses. Also noted 17.6% of responses (24.7%, i.e. 15 students) out of 85 students not have facility of internet accesses. However 75% of students were able to have an access to internet.



**Figure 8. Results of question 6**

#### **G. What course/ program are you studying currently?**

The question is to find out the percentage (%) of students belonging to engineering. The results obtained for question 7 are shown in Fig. 9. The question is answered by 100% of students.

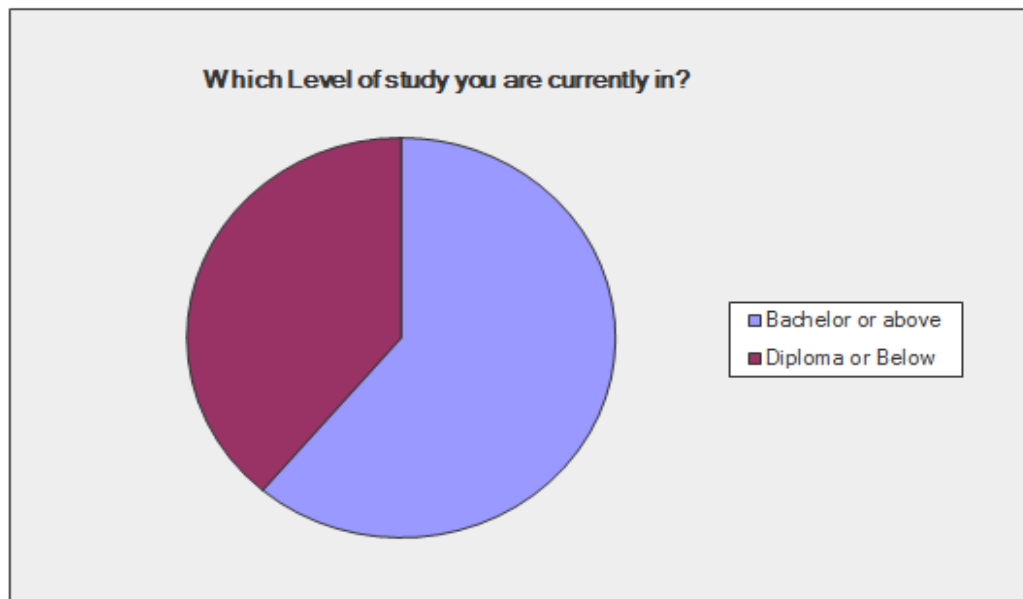


**Figure 9. Results of question 7**

The results obtained from Fig. 9, indicates that maximum percent of responses (81.2%) from engineering students, 15.3% from engineering related students and very small (3.5%) percent from non- engineering program students. Hence the major responses came from engineering and engineering related students.

#### **H. Which level of study you are in?**

This question is set to know level (Degree or Diploma) of engineering students involved in the survey. The results obtained for question 8 are shown in Fig. 10. The question was answered by 100% of students.



**Figure 10. Results of question 8**

The Results obtained from the Fig.10, indicates those maximum (61.2%) responses from degree students and 38.8% from diploma students. However the response from degree students is at the higher end.

#### **5. Conclusion and Recommendation**

This study offers preliminary findings on the use of mobile devices/smart phones for the learning activity in the engineering education and how the students perceived of their learning skills when these devices are introduced in the classroom for their learning process. The researchers have analyzed the answers to the quantitative questions in the survey in an attempt to gain an understanding of how current students perceive the use of mobile devices/smart phones in learning the information for the given task and presenting it orally in the class. The majority of the responses supported the perception that the smart phones increase the flexibility of access to various resources o support the engineering education. We should keep studying the pedagogy behind the use of smartphones in the actual classroom activities and develop appropriate activities that can utilize these devices efficiently. The smart phones technologies also are perceived as an effective tool in improving communication and learning in higher institutions

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