

An Analysis Study Of Smartphone Usage Habit Of Undergraduate Female Students At Zayed University

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Abstract---Smartphones continue to reshape our lifestyle and have become an essential part of our daily life, providing people with many services that were not available before on standard mobile phones. The increased features and computing capabilities of Smartphones have allowed them to replace other portable machines, such as laptops, for many users, but particularly for university students. This research paper explores the usage patterns and behaviors among Zayed University students. The main focus of the study is to understand how these smart devices are used as a platform or medium for communication, socialization, learning, entertainment and other activities on campus. A survey was designed and administered to over 400 Zayed University students, and data were collected and analyzed. The findings show that smartphone penetration rate is almost 100 percent (98%) among students, Blackberry and iPhones are the two most common platforms, almost half of the students own and use two Smartphones, and that more than half of the students spend more than five hours per day using these devices, sending and receiving over 30 text messages, using Blackberry messenger and What's app services. The findings also showed that Instagram is the most popular social media, voice communication is the most popular activity on their Smartphones, communication, including chatting and texting (using Arabic language), are the highest conception activities on these devices, with only 4% of students using their devices to access educational material, and that a significant number of students admitted using their Smartphones during class time.

Index terms- Smartphones, Social Media, Mobile Consumption Habit

I. INTRODUCTION

Smartphones have become a part of our daily life and they are providing us with many services that were not available in the past with regular mobile phones and only monopolized for PDA's (personal digital assistant) [1]. Mailing services, Wi-Fi (wireless networks) connection, mobile broadband, GPS (Global Positioning system) navigation and mobile Apps are examples of services that make our life easier and our tasks simple and all of that can be implemented easily on a smart - device that can be carried in the palm of the hand [1]. In 2010 Steve Jobs' prognosis of the future of Smartphones was that: "These phones are getting more and more intelligent about the world around them."

A recent study has shown that the usage of Smartphones is increasing dramatically around the world and the features of these devices are developing in the same rapid manner. The number of smartphone users around the world has reached 1.08 billion users and in the United States itself there are 91.4 million users [10]. In 2012 a research established by Google illustrated 6 countries that lead Smartphones adoption in the world and this research included forty countries. The results of the research revealed that Australia, the United Kingdom, Sweden, Norway, Saudi Arabia and the United Arab Emirates all have more than

fifty percent of their population using smart phones [8]. Furthermore, the United States, New Zealand, Denmark, Ireland, Netherlands, Spain and Switzerland currently have more than forty percent smartphone diffusion [8]

The use of Smartphones nowadays is not only dominated by businesses and businessmen. People from different age groups and social levels are using them. University students are also considered as a large category of Smartphone users and their use varies between educational, entertainment, reading and browsing activities. The advanced technology in Smartphones and their persistent acceptance and influential functionality have changed the lives of young students who are totally dependent on such technology. According to a survey performed by CourseSmart leaders in electronic Textbooks and digital materials, college students cannot move without checking their digital devices such as Smartphones or laptops [9]. Furthermore, a report has been published by King Abdullah's Center for research and technology on the status of Information and Communication Technology (ICT) in the Arab World [5]. The report outlined the mobile phone penetration and the mobile phone growth in the region. This report shows that in 2011 eleven countries had mobile penetration over 100% and those countries are GCC member countries, Libya, Jordan, Tunisia, Morocco and Egypt. KSA has the highest average of mobile phone penetration, at 189.24% followed by Oman with the rate of 168 %. The United Arab Emirates was in the fifth place, with an average of 138 %, and the lowest penetration rate was 52% in Yemen. Even though Yemen had the lowest penetration rate in 2011, the report shows that the growth of mobile phone use in that country between 2010-2011 was high, thus placing it in the second place in terms of growth list, with the rate of 22 %, after Sudan with 37%.

The main objective of this empirical study is to explore and investigate the usage patterns of Smartphones by female undergraduate students at Zayed University. Investigation in this area is important, as mobile phone use has infiltrated almost every aspect of female college students' lives. The study will shed light on the potential factors that impact on the undergraduate students' consumption habits and behaviors while interacting with their mobile devices.

This study also aims to explore the penetration of Smartphones among students at Zayed University; understand how these Smartphones are being used by the students; identify the activities and services used by students; investigate Smartphone usage and consumption patterns among college students; and identify any factors that impact users' activities on Smartphones. The rest of the paper is organized as follows: section 2 presents a broad overview of Smartphones' features and usage patterns; section 3 outlines the research methodology; section 4

presents the results analysis from the study; section 5 discusses the results of the quantitative study; and section 6 presents the conclusion and recommendations.

II. RELATED WORK

Smartphones are very popular and constitute a major share of the computing environment. Initially mobile phones were elite devices mainly used by upper class and middle class families. As technology started revolutionizing, more and more advanced features were included, apart from the basic communication facility, resulting in today's Smartphones. Some of the features included in Smartphones are advanced graphical interaction, touch screen, texting, music players, cameras, voice recognition, Internet facility etc.[12]. According to Litchfield, Smartphones can be defined as a phone that "runs an open operating system and is permanently connected to the Internet"[4].

College students are constantly connected to the web using their Smartphones for checking their emails, Facebook, Twitter and other social network sites. According to a research by Hackcollege.com "57 percent of college students use smart phones, 60 percent feel addicted to their phone, 75 percent sleep next to their phones, 88 percent texted in class before, 97 percent who have smart phones use them for social networking, and 40 percent used Smartphones to study before the test" (Yu, 2010). Messaging through text is a common feature used by all college students. According to the results of a survey conducted at the University of Colorado, the most common functions used in Smartphones by college students are texting and emailing, followed by reading the news, listening to music, watching videos and reading books[2]. Another research study conducted at the University of Brighton in the United Kingdom shows that texting has a slow transition from high school students to college graduates. University students use messaging applications for texting matters such as meeting times, assignments submission dates, and reminders from the professors to the students. This gives the students a sense of belonging and allows them to perform well academically [4].

Many colleges and universities around the globe have introduced a mobile application where students can access their campus networks through their Smartphones. A Canadian University, Ryerson, with 25,000 students, introduced a mobile library in 2008 through a smartphone version site. This online mobile library allowed students to lookup library hours, the schedules of workshops and basic contact information about the library. In 2009 it was updated with searching options, eBooks, and research help options etc. However, the researchers also state that limited scale mobile libraries can be set up, using mobile devices[15]. In a college environment, Smartphones are useful for students. They have a huge potential to be used as a tool for learning. They can be used for educational purposes, such as Smartphones enabled with web browsers, which are linked to huge sources of reference materials. There are also useful and inexpensive applications with Smartphones, which can be used for various purposes, and barcode labels can be scanned using Smartphones that will allow information to be captured for that specific object. According to Williams and Pence, Smartphones are very powerful and are being used in science classrooms. It is also said that iPhone applications allow the users to search for a wide variety of scientific

articles[14]. Mobile learning, also known as M-learning, has introduced the incorporation of Smartphones and the wireless facility. Mobile learning can be defined as "a learning using wireless devices that can be used wherever the learner's device can receive unbroken transmission signals"[16].

In the UAE, Abu Dhabi University has introduced an application called Blackboard Mobile, which allows the students to register for their courses, check for grades, and contribute to discussion in the classroom through Mobile phones[3]. They have also allowed students with Blackberry phones to access their updated study materials. The university is implementing a mobile education program in collaboration with Etisalat[11]. According to research studies, Smartphones can never completely replace a classroom but can be considered as an aid for academic studies[13]. The limitations of mobile technologies that should be considered are small screens, small keypads, less computational power, less memory, shorter battery life, higher risk of storage, low resolution and graphical limitations[13]. The factors that affect student's behavior in terms of adopting a mobile as a part of learning are those such as performance, expectancy, self-management, and social influences.

Younger generations today are used to electronics and technologies and are exposed to advanced digital gadgets. "Even though it may be impossible for professors/educators in older generations to catch up with the younger generation with regard to experience with new technologies and digital devices, they must still strive to embrace them as powerful new learning tools"[16]. Smartphones are considered to be a distraction in colleges rather than a learning tool. Usage of Smartphones in classrooms within many universities is prohibited as phones are mainly viewed as a medium for entertainment purpose. Researchers also have shown that educators have a positive attitude towards mobile phones to be used as a medium for learning but students' attention needs to be controlled. Thus, Smartphones can be considered as a medium for education by students.

Arabizi is a phenomenon that has increased with the quick spread of Smartphones. The typical meaning of Arabizi is to write Arabic words in English alphabets. There are many factors, which have caused the appearance of that language such as the global trend in most Arab countries, and, in particular, the United Arab Emirates (Nazzal, 2013). However the students and youth believe that the life style that they belong to has helped the case of using Arabizi on their daily life [7]. For example, some believe that writing in Arabizi makes their lives easier when communicating on modern mobile phones and that is because of the organization of the keyboard that makes typing in English easier than typing in Arabic, but, at the same time, they believe that expressing themselves is easier by using Arabic[7].

III. RESEARCH METHODOLOGY

The instrument that has been used in this research was an electronic online survey to facilitate and simplify the process of data collection. This electronic survey was designed and posted online which helped to collect data from 415 female Zayed University students from different majors such as Arts and Creative Enterprises, Business

Sciences, Communication and Media Sciences, Education and Technological Innovation. The participants were selected randomly via Zayed University emails to all female students at the Dubai campus. This instrument helped to reach a diverse collection of students with different ages, backgrounds, majors and interests. A qualitative evaluation shall be utilized for this research project, leveraging subjective methods such as interviewing and observations to collect substantive and pertinent data. All qualitative questions listed in the survey that required a subjective response were on a 5-point Likert scale. The survey contains twenty questions and each question is limited to multiple choices to constrain their answers and behavior. The questions were designed to study the usage pattern of smart phones among female students at Zayed University.

The questions are related to the user demographic, and their frequency of usage and mobile activities: 1) What is your college? 2) Do you use a Smartphone? 3) Do you use your Smartphone during class time? 4) How many Smartphones do you own? 5) What brand of Smartphone do you use? (Select your primary mobile phone if you have more than one) 6) How much time do you spend using your Smartphone per day? 7) How many texts do you receive per day? (Including SMS, BBM and what's app messages) 8) How many texts do you receive per day? (Including SMS, BBM and what's app messages) 9) How many texts do you send per day? (Including SMS, BBM and what's app messages) 10) Which of the following Instant Messaging services do you use? (You can choose more than one) 11) Which of the following social media do you use most frequently? (Choose only one) 12) What is the most common usage activity on your Smartphone? 13) Which language do you use most in your Smartphone communication? 14) What is the rate of consuming different types of information on your Smartphone? 15) Do you use your Smartphone during class time? 16) How much time do you spend using Smartphone per day? 17) Which of the following Instant messaging services do you use? 18) How many texts do you send per day? (Including SMS, BBM and what's app messages) 19) How many texts do you receive per day? (Including SMS, BBM and what's app messages) 20) Which of the following social media do you use most frequently? Finally, the timeframe was from May 7th to May 16th, 2013, which was slightly shorter than anticipated. After gathering the data, Microsoft Excel was used to perform data analysis and produce the results in charts and graph format.

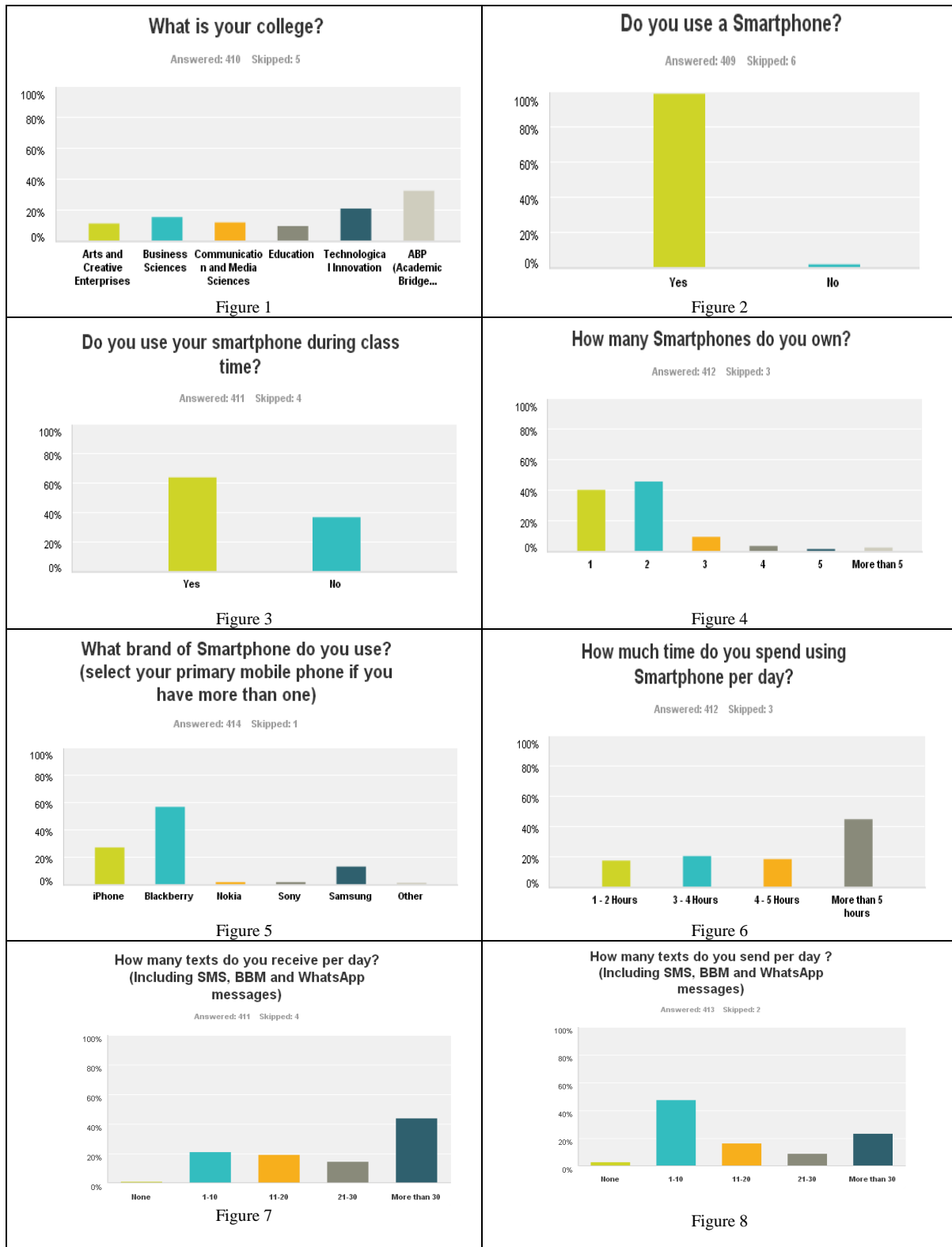
IV. FINDINGS

415 female students from Zayed University at the Dubai campus completed the survey. Students were aged between 17 and 25 years. The students were enrolled in different disciplines and majors: 37% were from the Academic Bridge Program (pre-majors students) and 63% of them came from major programs, including (17%) Business, (12%) Education, (15%) Communication, (21%) Information Technology and (15%) Arts and Sciences (Fig. 1). In terms of mobile penetration among Zayed University students, almost all of them (98%) own and use Smartphones, Fig.

2. Out of the student sample, (46%) own two different Smartphones and (42%) own only one, Fig. 4. It seems that the Blackberry is the most popular brand as the primary Smartphone among Zayed University students (57%), with the iPhone coming second with (24%) then Samsung is third (18%). Nokia and Sony are the least popular brands (4%) among students at Zayed University campus, Fig. 5.

The results show that almost half of the sample (45%) of students spend more than 5 hours per day using their mobiles, whereas (39%) spend on average 3-5 hours a day, and the least portion of students (16%) spend only 1-2 hours a day (Fig. 6). It was interesting to find that two out of three students admitted using their Smartphones during class time in any activity which is not relevant to class content or discussion (Fig. 3). In general, Zayed University students tend to send more text messages than receive messages via SMS (short message service), BBM (Blackberry Messenger) and what's app. The results show that 44% send 1 to 10 messages, whereas only 20% receive 1-10 messages a day. On the other hand, 52% of students receive more than 30 messages a day, whereas only 23% send more than 30 messages a day. On average, almost 50% of Zayed University students send and receive more than 30 messages a day (Fig. 7 and 8).

According to the survey results, BBM (Blackberry Messenger) (75%) and what's app (74%) are the most frequently used instant messaging services among students to chat and exchange text messages, whereas Google talk and Yahoo messenger came least popular with (3%) and (4%) respectively (Fig. 9). It also seems that Instagram (47%) followed by Twitter (41%) are the most popular social media websites for students with Facebook trailing behind (6%), (Fig. 10). It was interesting to note that the most common usage activity on Smartphones is communication (62%) followed by social media activity (20%) then entertainment (12%). However, browsing and searching, buying online, and educational use received the lowest usage rate amounting to only nearly 1% of total activities on Smartphones (Fig. 11). Students were almost divided equally among the three languages used for communication on Smartphones. The survey results show that Arabic is slightly the highest with (37%), followed by English (33%), and Arabizi (28%). Arabizi is an informal and newly invented language used mostly by Arab youth to communicate with each other using English letters to write Arabic words (Fig. 12).



Which of the following Social media do you use most frequently? (choose only one)

Answered: 402 Skipped: 13

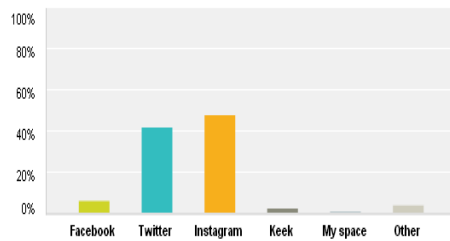


Figure 9

Which of the following Instant Messaging services do you use? (You can choose more than one)

Answered: 409 Skipped: 6

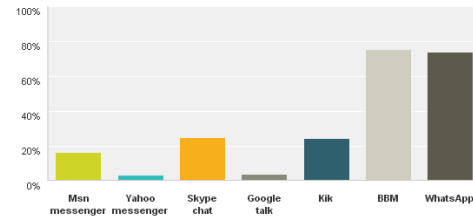


Figure 10

What is most common usage activity on your Smartphone?

Answered: 409 Skipped: 1

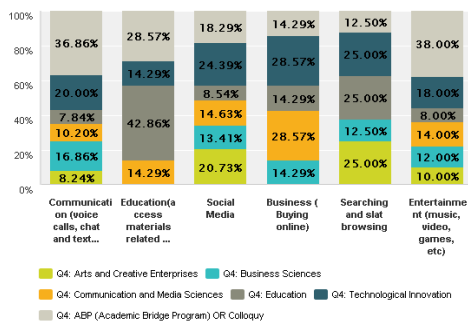


Figure 11

Which language do you use most in your Smartphone communication? (choose only one)

Answered: 412 Skipped: 3

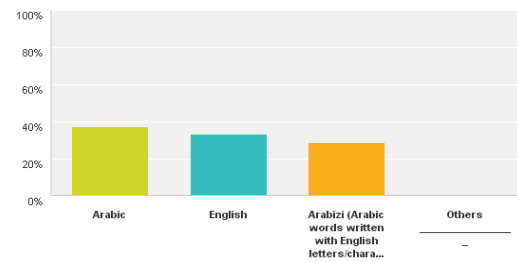


Figure 12

Do you use your Smartphone during class time?

Answered: 406 Skipped: 4

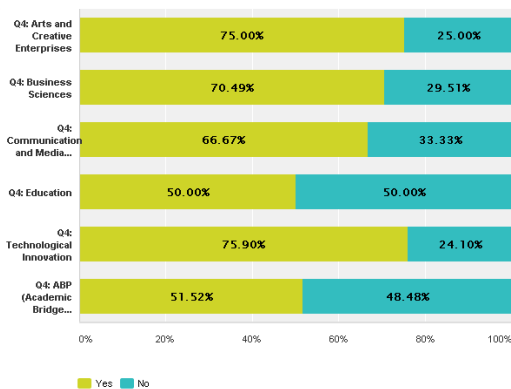


Figure 13

How much time do you spend using Smartphone per day?

Answered: 407 Skipped: 3

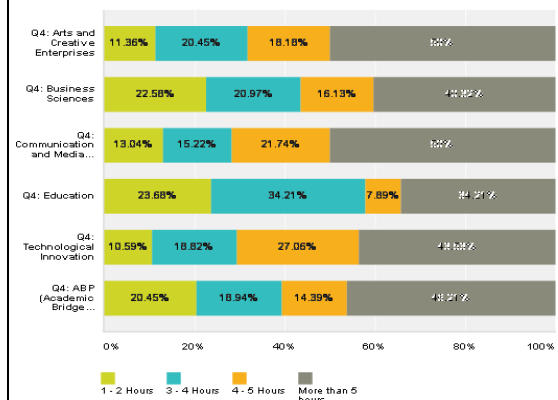


Figure 14



To study the effect of students' usage of smartphone during class time, it has been noticed that there are two groups, Arts and Creative Enterprises and Technological Innovation students who have the highest in-class usage rates compared with students from other disciplines. Technological Innovation students have the highest percentage (76%) followed by Arts and Creative Enterprises students by (75%). Business Sciences students were in the third place with the usage rate of (70%), whereas Communication and Media Sciences students were (67%). On the other hand, the ABP (Academic Bridge Program) and Colloquy students came second to last with (52%), however Education students came the lowest among all Zayed University students with (50%) (Fig.13).

Looking at the time Zayed University students spend using their Smartphones per day, this can be classified by their majors and results show that students in Arts and Creative College and Business Sciences got the highest percentage with (50%) for using their Smartphone for more than 5 hours a day, followed by ABP students by (46%).

Technical Innovation students (27%) use their Smartphones for an average of 4 to 5 hours per day. However, it is the Education students again (34%) who spend less time using their Smartphones for more than 5 hours and for 1 to 2 hours with (23%). The survey also has shown that Business Science and Art and Creative Enterprises students have the highest rate (39%) when it comes to using What's app as an instant Messaging service. However, Technological Innovation students use BBM (38%) followed by Communication and Media students (37%). For some unclear reasons, both Education and Business Science majors do not use MSN messenger, and Yahoo messenger and Skype chat are used by very few students (Fig. 9).

The study shows that most Zayed University students are very active in the use of social media, employing a wide range of diverse services. Students enrolled in Arts and Creative Enterprise (53 %), and Business Sciences (51%) use Instagram service more frequently than others. However, students enrolled in Technological Innovation (49%), ABP

Academic Bridge Program) (43%) and Communication and Media Science (42 %) use Twitter as their main social media platform. Once again, Education students are the least active students on social media on campus. This is even though Education students were listed as the second highest group after Business in using Facebook (Fig. 18). Using their Smartphones, figures 16 and 17 present the average number of text messages that are sent and received by Zayed University students per day based on their majors. The type of text messages includes SMS, BBM and What's app application messages. Technical Innovation majors have the highest percentage (56%) of receiving text messages (more than 30 messages) per day. This is in contrast with Education major students, who have the lowest percentage (29%) of receiving messages per day.

When it comes to the extent and most popular languages Zayed University female students use in chatting and communication, it has been noticed that there is a wide variety of languages employed. For instance, Art and Creative Enterprises students use English as their first and most favorite language (52%) followed by Communication and Media Science (37%). Education, ABP (Academic Bridge Program) and Colloquy students came third with (31%), however, Technological Innovation students came

V. DISCUSSION

It was interesting to note that the Blackberry was the most popular Smartphone platform for female Zayed University students. The iPhone and Android were the second most popular Smartphones on campus. In fact, today due in large part to the diverse versatility and incredible internet broadband capabilities of Smartphones, professors at Zayed University are increasingly promoting the use of mobile devices as a platform to enhance learning and raise students' knowledge acquisition. This observation is inline with the recent initiative adopted by Zayed University to shift from laptop campus to iPad campus. The results from the study reveal that students enrolled in Technological Innovation and Arts and Creative Enterprises majors are the heaviest Smartphone users on campus. These students are more likely to benefit from the advanced technological and computing features of Smartphones than other majors because they provide them with a creative and innovative environment to enhance their classroom experiences. Some of these benefits are the ability to access the Internet resources for research, capture an image, take a short video of key lecture notes, keep track of dates and schedules and to record lectures with Voice Memo and other third-party note-taking apps. Moreover, Smartphones provide Apps that convert classroom "clickers" which can answer multiple-choice questions and find relevant course material with a simple click or touch. In addition, the curriculum of the two majors, Design and Technology, are very heavy with hands-on and practical learning activities, when compared with Education students.

The results show that Education students are the ones who spend the least time using Smartphones on campus. This has contributed to the fact that Education students, on average, are older than most of the students and some are married with family responsibilities, often holding jobs

outside campus. According to previous studies in the literature, younger students are more addicted to Smartphones as they use them as the main medium to communicate and connect with their friends. In the case of married students, they tend to have less spare time and fewer friends to stay in touch with, so, as a result, they spend less time on communication. This contrasts sharply with Communication and Media students who have the highest percentage of users on Smartphones per day. Nowadays, technology is an integral part of most of Communication and Media curriculum. Also, Communication and Media students have more technological requirements and are expected to be knowledgeable and skilled in technology by the time that they graduate. Another related factor is that Communication students depend on Smartphones for their assignments and other coursework activities such as accessing the library resources, sharing resources with friends, and conducting group discussion through mobile technology.

The results also indicate that Business Sciences and Technological Innovations students have the highest usage rate for instant messaging services. These days, University students are very dependent on Smartphones for their communication. Therefore they would rather use the instant messaging application services, which are considered inexpensive, than calling, because most of the instant messaging applications are available, easy to use and free of cost. The results also showed that WhatsApp and BBM instant messaging applications are being used by most of the majors in the list. BBM and WhatsApp provide students with various features such as text messaging, sending pictures, sending videos, sending audio messages, locations, checking chat history, mailing conversations, and broadcasting messages to multiple recipients. These students are utilizing those features provided by the instant messaging applications for communication and for sharing of their resources.

Other interesting results show that Technology major students have the highest percentage of text messages received per day, using services like SMS, BBM and WhatsApp. Technology and Innovation majors, in general, have more group assignments and projects than other students, which therefore require group discussion and interaction. The charges for communication through regular voice calls is higher than SMS whereas most of the instant messaging applications can be used for free. By comparison, the Education major students have the lowest percentage of texts received per day using mediums such as SMS, BBM and WhatsApp. As this study has revealed, Education students spend the least amount of time using Smartphones and this could be attributed to the fact that most of them are married and have other responsibilities. In the case of women married with children, they have more family responsibilities and less time for communication. Moreover, the average age group of the Education major students is generally above that of the Zayed University student average. They are often mature students who only use Smartphones for important matters.

Surprisingly, the results show that Arts and Creative Enterprises and Business students have the highest use of social media. They use social media networks to communicate and socialize with peers, friends, family members and even unknown persons. They can interact with multiple users at the same time and also monitor the activities of their friends who are located at distant geographical places. They interact in their own time and at their own convenience to ensure the speedy dissemination of news and information. So it is essential for them to connect with their peers and friends after school hours. Therefore they could create events and groups in social media network and have multiple discussions and chats. The Arts and Creative Enterprise and Business major students are more creative and enjoy exploring the things around them. They like to share their life stories with friends by exchanging photographs captured by Smartphones, especially on Instagram. It is a medium through which they could connect across the world using photos.

According to the results, Facebook has the lowest usage rate for Technological and Innovation major students. It has contributed to the fact that they are exposed to advanced tools and thus have more knowledge and skills, especially in the areas of security and privacy. They do understand the pros and cons of using Facebook. Privacy is the major factor that restricts them from using Facebook. Photographs shared can easily be downloaded by other users and modified and misused. Their activities on Facebook can be monitored and private information about them, as well as their friends, can be easily captured on profiles of other users.

Other interesting results show that Education students have the lowest usage rate of social media. As mentioned earlier, most of the Education students are married, working while they study, and thus they have more responsibilities and less time to socialize. The survey results also show that Art and Creative Enterprises students and Communication and Media Science use English more than other languages. English is considered as an international language for business, but, surprisingly, more Business students at Zayed University choose to use Arabic in their communication than English. However, when it comes to speaking the Arabic language, Education students have the highest usage rate. It is due to the fact that most Education students have been educated at from public schools where Arabic is the main language of instruction and communication. In addition, there are a few courses in the Education major that are taught in Arabic, so they are trained to be fluent in both languages. Consequently, they are qualified and prepared to teach in either public or private schools.

VI. CONCLUSION

The use of Smartphones by female students at Zayed University has become an important issue that has received much attention from the university administration, faculty, and staff. It therefore needed to be explored and analyzed. Smartphones are the fastest and the latest growing technological devices for mobile phone networks. The main objective of this study was to explore and investigate the usage of Smartphones by female undergraduate students.

Universities need to align their curriculum to meet the new demands of students by incorporating Smartphones into the academic curriculum and by developing related activities to support learning on campus.

The results from the study showed that Smartphone penetration among female Zayed University students is 98% (use and own). The primary Smartphone devices used by students on campus are the Blackberry, followed by iPhone. Nokia and Sony are the least popular brands. The research indicates that students spend an average of more than 5 hours per day on their Smartphones. A significant number of students admitted using Smartphone during class time. Students are inclined more towards texting, mainly through SMS, BBM and WhatsApp. Most of the students use instant messaging applications such as BBM and WhatsApp for texting. Google Talk and Yahoo have the lowest usage rate on campus. Instagram is the most popular social media, followed by Twitter, with Facebook receiving the least usage rate. The usage of Smartphones for information searching, browsing, online shopping and educational purposes reported are very low. The preferred language of communication used by students to interact with their devices are Arabic, followed by English then Arabizi. Communication, including chatting and texting are the most used activities on these devices. Only a few students use them to access educational materials and a significant number of students admitted using their Smartphones during class time.

Several findings of previous international studies have focused on the penetration and usage of Smartphones on college campuses whose results highlighted that students were very much interested in using mobile technology, mainly for communication and entertainment, but with only limited use for educational purposes. The results of this study are consistent and in accordance with these international findings. This study has taken a somewhat different look at how university students interact with Smartphones and how they define their habits and consumption patterns through the use of these smart devices. Based on the findings of this study, it is clearly essential to raise the awareness of students with regard to the potential benefits of using Smartphones as a learning tool. Some of the recommendations that need to be considered by the administration of higher education institutions in order to further improve the deployment and usage habits of Smartphones on campuses are:

- Textbooks and additional reference books should be accessed through Smartphones which will allow students to use them easily as a tool to connect to learning material and resources
- University library collections should be linked to Smartphone applications which will allow students to navigate through library resources and content at any time and from any place
- Universities should develop applications that will allow class assignments, projects and other coursework to be submitted by students through their Smartphones

- Universities should develop a social media platform, related to various courses, which would allow faculty and students to connect and communicate with each other

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