The Most Used Technological Tools by Telecommunications Students in ISUTIC

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Abstract - *The teaching and learning process has faced great challenges due to the speed of transformation of society. In this sense, the integration of technologies in the style of teaching and learning is an essential factor that stimulates the assimilation of contents by the students, who in the current dynamics are active protagonists in the production of knowledge. This work evaluates the technological tools most used by students of the 3rd year of the Telecommunications course at the ISUTIC (Higher Institute of Information and Communication Technologies), in order to outline a strategy for integrating technological tools into the teaching and learning process.*

Key Words: technological tools, Facebook, WhatsApp, YouTube, teaching and learning, ICT.

1. INTRODUCTION

The advent of ICT information and communication technologies has transformed virtually all walks of life, including in the education sector. Today, higher education has faced enormous challenges resulting from the deep and dynamic changes in digital society and market needs [16].

A few years ago, mobile devices have penetrated the daily activities of the people, creating new needs and at the same time, new opportunities for modern services through these devices. This results in the search for alternative projects in educational processes. In these circumstances, the m-learning (mobile learning) appears with the main feature to enable access to digital educational content, educational activities and services not only through desktops, but also through mobile devices (cell phone, Tablet, Smartphone iPad, PDA, wireless and laptops, etc.), without restrictions of time or geographical space [1], [7], [8], [11], [14], [21].

ICTs have had a major influence on teaching and learning processes, mainly because of the tools they produce. Khan [9] emphasizes that ICTs are inseparable from instructional objectives in a freer dialectic relationship, with the object of activity to establish the methodological level of all activity. Schneckenberg cited by Christou et al [4], emphasizes that one of the common uses of web 2.0 is to build collaborative online learning communities for diverse populations of learners. Web 2.0 tools, such as wikis, blogs, social networks, and computer programs, enable learners to contribute their personal views, ideas, and reflections to creating collective and collective online content [4].

This work aims to analyze the main technological tools most used by students of the 3rd year of the Telecommunications course at the Higher Institute of Information and Communication Technologies (ISUTIC), with the purpose of their integration into the teaching and learning process.

2. CONTEXTUALIZATION

The application potential of technological tools in teaching and learning methods are an ongoing challenge of modern higher education institutions, for these innovative methods encourage students to create and develop a scientific and reflective spirit. Technological tools provide a unique opportunity for students to enhance their digital communication skills [22]. Among several technological tools were selected for the present study seven: Facebook, Instagram, LinkedIn, Skype, Twitter, WhatsApp and YouTube.

Facebook - is the most popular social network in the world, with more than 2.06 billion users [19]. This platform has a number of interesting tools, most often under-utilized, which can be very useful tools for teaching and learning process [16]. Allows any user to create a public or private group to share text, image, and video conversations. In the contest of engineering education design, these capabilities can be used for group discussions on the approach to a subject, content sharing, or even participate in the burning issues in society solution [2].

Instagram - is a tool for sharing photos and videos in public, semi-public or private channels. It is widely used to advertise brands especially in the beauty, fashion and luxury brands [12]. In 2017 it reached 700 million active users per month (http://www.statista.com). It was released in 2010 by North American Kevin Systrom and Brazilian Mike Krieger, graduated from Symbolic Systems (a combination of Computer Science and Design) from Stanford University, California. The idea began to be conceived in May of the same year when they both started working on an application called Burbn - whose goal was to help people share experiences and stories out of the office and home. After some adjustments, the application was made available in October as "Instagram", reaching the milestone of one million users three months later [15]. Due to portability and ubiquity, the platform re-signified the use of mobile cameras and the mobile trend in consumption. Creating an account on the platform is free, so anyone connected to the Internet have access to use and can publish on behalf of a brand, company or personality / person, so the application is also home accounts of large international brands to small brands and local businesses [15], [12].

LinkedIn - is the world's largest professional social network. Provides skills to present an understandable CV and share the status or dynamics of updates in the professional context. Some relevant data related to LinkedIn are: 467 million users in 2017, available in 24 languages, geographically available in 200 countries and territories, has more than 10,000 full-time employees and offices or offices in 30 cities worldwide, 57% users are male, 40 million students and recent graduates are LinkedIn users, the countries with the largest number of users are USA, India, Brazil, UK and Canada

(https://www.linkedin.com/pulse/linkedin-numbers-2017-statistics-meenakshi-chaudhary).

Skype - is a text and video message sharing tool capable of providing video conferencing [13]. It is a desktop application that combines VoIP technology with the organization of a database of participants, similar to social networks [6]. Skype allows you to make calls using the microphone and speakers of a computer by calling to a computers that have skype as well as to fixed and mobile phones worldwide using SkypeOut system beyond the instant message system (convenient in case of low connection), the application still allows teleconferences - voice only, connecting up to 100 people simultaneously, or videoconferences with up to 10 people [18], [3]. It has been able to realize the fiction of the videophone by combining simplicity of use and low cost, provided a computer with microphone, sound card, speakers and broadband Internet access is available [6]. Lee cited by [18] considers the following potentialities of Skype: it does not need advanced hardware beyond a desktop or laptop with internet access; is quite affordable while prevail internet signal; with the massive use of technological devices, does not require high knowledge or new skills to its users; promotes authentic and collaborative learning; Skype promotes synchronous and asynchronous communication between language teachers and students; via Skype, lesson materials can be updated and adapted quickly and easily, which is beneficial for teachers who wish to teach because of the location of the students.

Twitter - is a social networking services microblogs, created in March 2006 by Jack Dorsey, Evans Williams, Biz Stone and Noah Glass, and released in July of the same year [23]. The company Twitter is based in San Francisco and has more than 25 offices worldwide available in multilingual [2]. A user may follow any other user, while the user followed may not necessarily match his follower. This tool provides a good platform for designing and conducting academic activities, especially in the social sciences and humanities [9], [23]. However, press for short messages by limiting each post to 140 characters.

WhatsApp - is a social network that provides instant messaging to mobile device users [2]. It was created in 2009 by Jan Koum and Brian Acton [23], the WhatsApp Company based in Mountain View, California USA and gained greater popularity in mobile phone users. WhatsApp messages feature the following features: multimedia, group chat, unlimited message, compromise platform, short messages can be offline, free, requires no PIN or username [23]. WhatsApp can be used as an important tool in teaching-learning and training. Khan [9] lists some strategies that can be used by teachers and instructors as facilities for the WhatsApp tool: to create groups to communicate with their members about the subject being studied; share important information from classes; send video lessons and audio; send self-study tasks; being connected with students out of class and reminding them of pending tasks and subsequent units; controlling students' participation in discussions and group work; being in contact with caregivers or family members when they are absent for a long period or do not comply with the activities.

YouTube - is the platform to share videos, created in February 2005 by Steve Chen, Chad Hurley and Jawed Karim [17]. The site, which at that time had the slogan "Broadcast Yourself" was considered the best invention of the year by the American magazine Times; and in November 2006, Google acquired the network for $ 1.65 billion [5]. YouTube's primary functionality is to provide users with the original search, viewing, and sharing of videos [20]. It also provides forum services to connect people globally [17]. Available in more than 88 countries and in 76 languages, Google has defined YouTube's largest consumers and their preferred options and intentions regarding the platform. The new generation audience hold a common interests such as: share, create, connect and communicate, with 71% of the public has less than 35 years old and 52% are men [2], [5], [13].

The comparison of the main features of these technological tools is shown in Table 1.

Table -1: Main characteristics of technological tools

Tool	File Format	Maximum size	No. of chats per day	Characters (maximum text)
Facebook	Image, video and text	200MB Image: 2048x(h → free)	Unlimited	2000
Instagram	Image, video and text	Video ≤ 60s Image: 1.9:1 to 4:5		Nominal 2000 Ideal ≤ 138
LinkedIn	Image & text	Image: 698x400pxl	Unlimited	700
Skype	Voice, video and text	Teleconf.≤100 Videoconf.≤10 user 300MB		
Twitter	MP4 (video), doc, pdf	512MB	250 sms per day or 1000 tweets per day	140
WhatsApp	Pdf, doc, ppt, MP4	16MB; (for xml ≤ 2GB)	Unlimited	Unlimited
YouTube	Image, text and video (Mov; MP4; Avi; Wmv)	Video ≤ 15 min; Image: 3840x2160pxl (or 16:9)	Unlimited	Title in the desktop or mobile: 73

3. METHODOLOGY

This is an exploratory descriptive study, with a quantitative approach, carried out in the second half of 2017, with a population sample of students enrolled in the subject of Mobile Communications, 3rd year of the ISUTIC Telecommunications course. ISUTIC (Higher Institute of Information and Communication Technologies) is an Autonomous Public Higher Education Institution, based in the Province of Luanda - Republic of Angola.

The instrument for data collection comprised a semi-structured questionnaire composed of two parts: one related to the type of mobile device that each student carries out on a daily basis, and the other part related to the purpose of the use of Facebook, Instagram, LinkedIn, Skype, Twitter, YouTube and WhatsApp, from a universe of 100 most used ICT tools (http://c4lpt.co.uk/top100tools/), [10]. 110 students participated in the study.

4. RESULTS AND DISCUSSION

The average age of participants was 23 years and only 14.55% of the females.

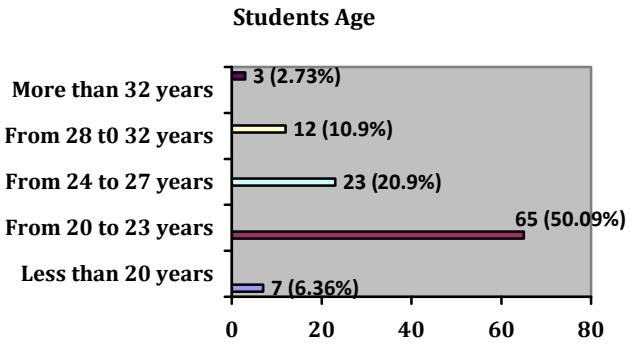

Fig -1: Age range of students involved in this research

The distribution of students by gender is shown in Fig. 2, with 16 female students (14.55%) and 94 male students (85.45%), revealing the poor adherence of the female gender to the engineering courses, specifically to Telecommunications engineering. This discrepancy does not record both the engineering course Informatics, also taught in ISUTIC despite the male gender is predominant.

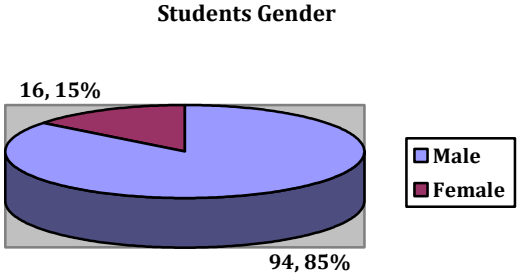

Fig -2: Distribution of students by gender

The first questionnaire was on the type of mobile device that each student sport on a daily basis (smartphone, tablet, 3G or 2G mobile phone).[1]

Q_{1D} – What kind of mobile device do you use (smartphone, tablet, 3G or 2G mobile phone)?

The answers to this question following results: 36.36% student has a smartphone, tablet sports 10.91%, 41.82% have 3G mobile phone (3rd generation) and 10.91% android 2G mobile phone, as shown in Fig. 3.

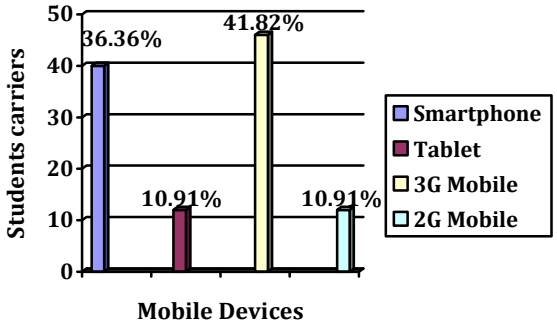

Fig -3: Type of mobile device used by students

Q_{2D} – For what purposes do you use your mobile device?

The answers to this question reveal that in general the students use their mobile device for academic purposes, communication and entertainment, so this use varies according to the period throughout the year, as shown in Fig. 4.

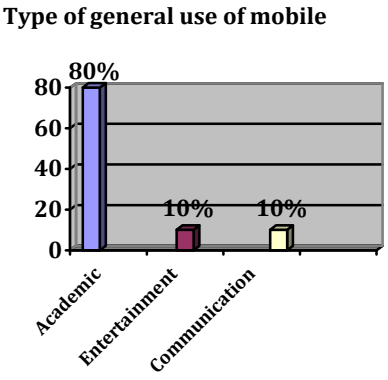

Fig -4: Using general (purpose) of the mobile students

a) In the academic period

[1] *Q_{1D} → 1st question related to the Device;*
Q_{1T} → 1st question related to the Tool.

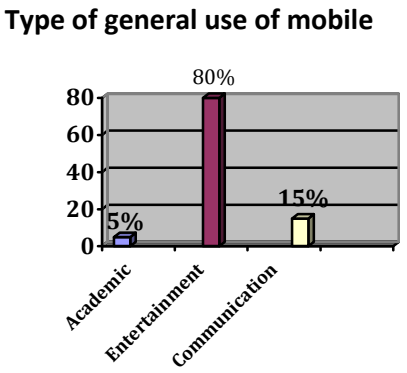

Fig -4: Using general (purpose) of the mobile students

b) In the vacations period

Q_{3D} – What academic activities do you use your mobile device for?

The answers to this question show that students with mobile devices that support Internet tools and applications use them to search the internet (36%), share the subject with colleagues (25%), and discuss topics via chat with colleagues (23%) while others use their mobile device as a support tool (12%). This result is illustrated in Fig. 5.

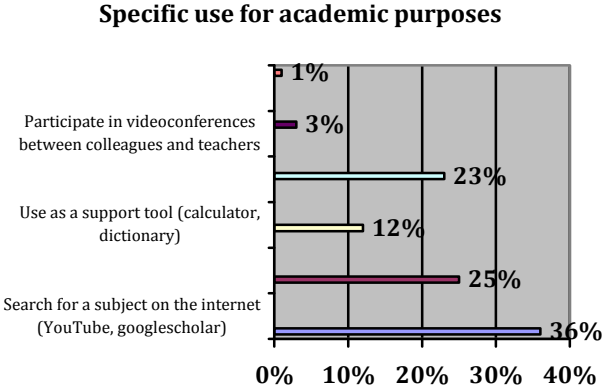

Fig -5: Specific use of mobile devices for academic purposes by students

The second questionnaire was related to the most used tool by the students among the 7 selected: Facebook, Instagram, LinkedIn, Skype, Twitter, YouTube and WhatsApp.

Q_{1T} – Which of the following technological tools do you use on your mobile device (Facebook, Instagram, LinkedIn, Skype, Twitter, WhatsApp and YouTube)?

The results summarized as a percentage in Table 2 indicate that almost all students with high-performance mobile devices use YouTube (78.18%), Facebook (77.27%) and WhatsApp (72.73%) half uses Twitter (45.45%), while the less used tools are LinkedIn (19.1%), Instagram (18.18%) and Skype (0.64%). These results are also shown in Fig. 6.

Table -2: Use of technological tools by students

No	Technological tool	Ranking on the internet, 2017 http://c4lpt.co.uk/top100tools/	% of students using it
1	YouTube	1	78.18%
2	Facebook	8	77.27%
3	WhatsApp	13	72.73%
4	Twitter	5	45.45%
5	LinkedIn	7	19.1%
6	Instagram	34	18.18%
7	Skype	11	0.64%

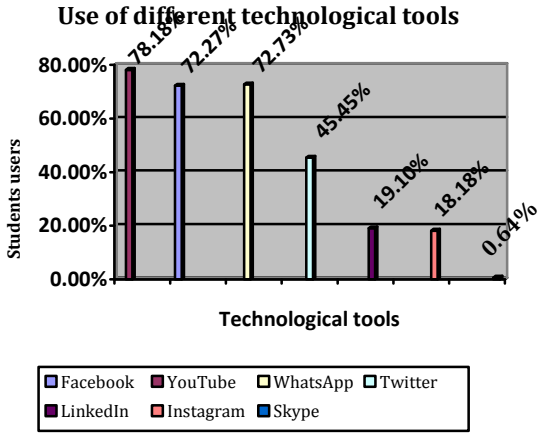

Fig -6: Tools most used by students approached

Q_{2T} – How often do you use technological tools for academic purposes?

The answers to this question reveal that the tools most frequently used by students are WhatsApp (66.36% daily), Facebook (67.27%) and YouTube (56.36%); while the less used ones are Skype and LinkedIn. The summary of this subject is presented in Table 3.

Table -3: Frequency of use of technological tools by students

Tools	Never used		Rarely (1 or 2x per week)		Frequently (3 to 5x per week)		Every day		Total	
	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%
Facebook	0	0	19	17.27	74	67.27	17	15.45	110	100
Instagram	29	26.36	68	61.82	12	10.9	1	0.91	110	100
LinkedIn	27	24.55	79	71.82	4	3.64	0	0	110	100
Skype	63	57.27	45	40.9	2	1.82	0	0	110	100
Twitter	13	11.82	66	60	21	19.09	8	7.27	110	100
WhatsApp	12	10.9	5	4.55	20	18.18	73	66.36	110	100
YouTube	0	0	28	25.45	62	56.36	20	18.18	110	100

Some students have revealed that although they do not have mobile devices that support these tools, they have regular contact with the tools from portable or even desktop computers.

5. CONCLUSIONS AND RECOMENDATIONS

It was observed that despite the heterogeneous nature, each student has at least one mobile device with access to several technological tools. The most popular technology tools among the students are YouTube (78.18%), Facebook (77.27%), WhatsApp (72.73%) and Twitter (45.45%), with the first three being used by all students who have mobile devices that can support them.

Most students use these tools often for academic purposes, such as searching the internet, sharing it with colleagues, and discussing topics via chat with colleagues.

Faced with these evidences, it is fundamental to create conditions to enable and persuade teachers to use these tools in the teaching and learning process in all disciplines, as they will contribute to improve the collaborative work among the subjects of the process, creativity and active construction of knowledge by the students.

Finally, the use of technological tools already known by the students in the teaching-learning activities should be the vision of all teachers who now have the task of preparing intellectual, professional and culturally future generations.

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