

SECONDARY EDUCATION STUDENTS' TECHNOLOGY USE IN DIGITAL ENVIRONMENTS

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***Abstract:** The aim of this study is to identify the uses of digital technologies by secondary school students and how they may change in regards to the different digital scenarios. Therefore, 78 secondary education students completed a Likert-scale questionnaire, providing information about their digital technology use and habits in a variety of areas. The results show that young people use a range of digital technologies in different scenarios and the social media used by students in free-time and study scenarios.*

Keywords: Digital Technologies, Secondary Education, Scenarios

INTRODUCTION

This Information and Knowledge Society (Castells, 2011) can be defined as an era of rapid technological advancements and digital revolution, where a lot of a person's daily activities take place in an online world, both personal and professional (Kolojytha et al., 2015). Digital technologies have transformed all aspects of our lifestyle and social customs (Cabero, 2008) and in consequence, educational systems and teachers are taking steps towards educating in the digital age. The rapid and progressive growth of digital technologies in the world (Kemp, 2017) has allowed for the development of new digital platforms, including social networks and applications that are very appealing and popular with young people as a means of interacting, searching for information and media, as well as communicating together (Arcilla & López, 2017; Noguera, 2015). Technology-based learning offers a range of educational prospects that would not arise from a traditional style classroom and can enhance educational contexts incorporating multimodal formats of information (Lee & Lee, 2018), complementing the course-book as the default tool for teaching (Kalyuga & Liu, 2015; Area et al., 2016). The endowment and the ease of access to digital technologies in education has led to a new set of digital learning scenarios (Wang, et al., 2009; Cobo & Moravec, 2011, Jones & Jo, 2004, van Hermelen, 2006;

Dabbagh & Nitsantas, 2011, Mikropoulos & Natsis, 2011) in which a person can use technology in order to select, share, solve problems on a personal, professional, social and academic level. In other words, young people have found new forms to relate, communicate, learn, satisfy their curiosity and have fun through the use of technology (Lobera & Rubio, 2015). From which, the learning process takes on a more connected (Siemens, 2005) informal, open-access role, accessible anywhere at any time (Gutiérrez & Mikiewicz, 2013). Previously, in Extremadura (Spain), there has been an increase in digitalizing schools. Internet connectivity during previous courses has risen to 93,3% in public primary schools and 98,4% in private and state-maintained schools (Secretariat Spanish Education Ministry, 2015). However, we still have to answer: How are students learning with technology? Therefore, the aim of this study is to describe the digital technology use of Secondary Education students in different digital scenarios.

1. EDUCATION AND SOCIAL MEDIA IN A DIGITAL AGE

The emergent and current generation, in regards to the use of technology and cognitive processing, have been classified with such terms as Millennials (Howe and Strauss, 2000), Digital Natives (Prensky, 2007, 2010), Knowmads (Cobo & Moravec, 2011) and New Millennium Learners as created by the New Media Consortium and Educause (2010), who also detail the changing ways that members of this generation learn, communicate, entertain themselves, work together, use technology to interact and seek out information. In addition, Prensky (2007, 2010) suggests that students are no longer the people our educational system was designed to teach.

The implications of the incorporation of technology in the teaching and learning process are more evident, as students are said to be accessing, managing, creating and sharing knowledge in dramatically different ways as their teachers often do, but also have radically new expectations regarding what a quality learning experience should be (Pedró, 2006). However, there are studies (Barak, 2018; Ng, 2012; Karimi, 2016; Margaryan et al., 2011) that question to what extent these digital natives really are, adept at using digital technology in everyday life and if they are cognitively different in comparison to previous generations (Kirschner & Bruyckere, 2017). Moreover, research shows that students frequently use ICT and social media for personal and leisure activities, however, they are quite limited when applying these tools in an educational setting. Teachers still have an opportunity to help their students navigate successfully through the promises and pitfalls of learning in the digital world. (Barak, 2018).

Other research studies conducted suggest that digital technologies and multimedia learning has a significant effect on a student's emotional and metacognitive ability, positively mediating the learner and their learning experience (Kalyuga & Liu, 2015; Park et al., 2015) and enables teachers to find new pedagogical approaches

(Beetham et al, 2009; Gutiérrez & Mikiewicz, 2013; Montrieux et al., 2015).

Digital Technologies impact learning and they aid in the process of communication and access to information as well as, increasing the quality of learning (Ozerbas & Erdogan, 2016). They complement educational contexts with a different kinds of information and formats. The teaching and learning process is no longer restricted to a classroom setting with a traditional outlook where the focal point is on the teaching process. The incorporation and improvement of digital technologies in education has led to a new set of Learning Scenarios (van Hermelen, 2006; Dabbagh & Nitsantas, 2011) where people can use technology in order to select, share, solve problems on a personal, professional, social and academic scale.

2. METHOD

The research follows a quantitative methodology with a descriptive design in which data will be addressed in a descriptive and explanatory way, in order to detail the social networks and digital technologies used by Secondary Education students from Extremadura (Spain), in academic and free-time settings during 2016. The total number of participants of the study is 78. In regards to sex, 53,85% are women and 46,15% are men. All participants are in the last year of Compulsory Education with ages ranged from 14-15 years old (42,31%), 16-17 years old (53.85%) and over 17 years old (3,85%).

The research instruments used to collect data on the use of Digital Scenarios is The Digital Scenarios Questionnaire (DSQ), constructed ensuing content validity via a group of experts and reliability with the statistical support of Cronbach's alpha, scoring ($\alpha = 0,812$) on the total of items of the instrument. The DSQ was a Likert-scale questionnaire, ranging from 5 (Always), 4 (Often), 3 (Sometimes), 2 (Hardly ever) to 1 (Never). It is made up of 46 items grouped into three dimensions with several sub-dimensions: I) Sociodemographic and Identification Data, II) Digital Technology Use (which was consequently subdivided into free-time, study and work-project use) and finally III) Device use (divided into free-time and classroom use).

3. RESULTS

The following data sets show which digital technologies and social media are favoured by Secondary Education students in their free time settings.

Table 1

Descriptive statistics on free time technology use

Free Time n=78	Mean	Median	Min	Max	Percentiles (25, 75)	
Facebook	1.64	1.00	1	5	1.00	2.00
Twitter	2.86	3.00	1	5	1.00	4.00
Instagram	4.13	5.00	1	5	4.00	5.00
Snapchat	3.76	5.00	1	5	2.00	5.00
IM	4.86	5.00	3	5	5.00	5.00
Vine	1.44	1.00	1	5	1.00	1.25
Periscope	1.45	1.00	1	5	1.00	1.00
Web Page	1.10	1.00	1	3	1.00	1.00
Virtual Environments	1.31	1.00	1	3	1.00	2.00
Videogames	2.77	3.00	1	5	1.00	4.00
Blog	1.74	1.00	1	5	1.00	2.00
Information Pages	3.18	3.00	1	5	3.00	4.00
Mean	2.52	2.67	1.33	3.42	2.23	2.83

Source: own work

As shown in the previous table, and the following graphs, the main tools used by students are Instant Messaging e.g. WhatsApp, Viber, Telegram (4.86), followed by Instagram (4.13), Snapchat (3.76) and Information Consultation Pages (3.18). The least used by these students are: Webpages (1.10), Virtual Environments (1.31), Vine (1.44) and Periscope (1.45). The following graphs show the data collected on the five most preferred digital technologies used in free-time scenarios:

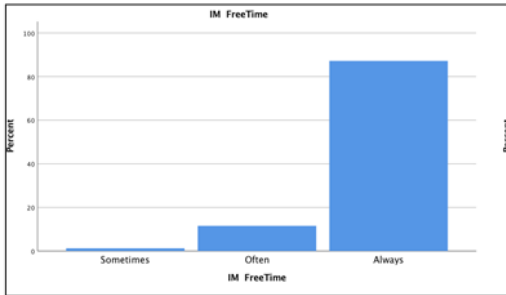


Figure 1: Instant messaging in free-time scenarios

Source: Own work

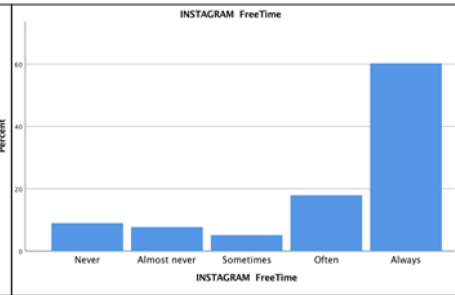


Figure 2: Instagram in free-time scenarios

Source: Own work

When asked about the use of Instant Messaging in participant’s free-time they answered the following: never (0%), almost never (0%), sometimes (1.28%), often (11.54%) and always (87.18%). Meanwhile, in regards to Instagram, indicated:

never (8.97%), almost never (7.69%), sometimes (5.12%), often (17.95%) and always (60.26%).

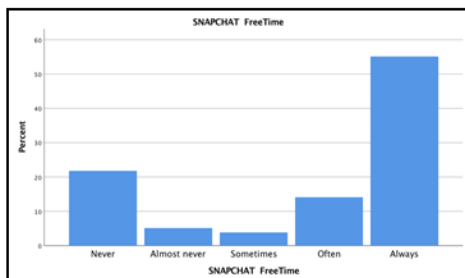


Figure 3: Snapchat in free-time scenarios

Source: Own work

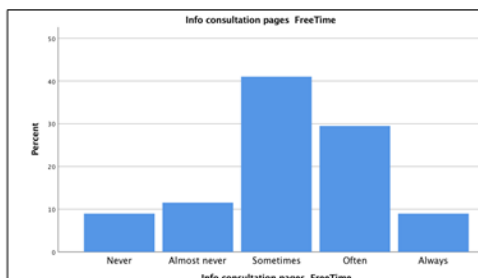


Figure 4: Information Consultation Pages in free-time scenarios.

Source: own work

When asked about the use of Instagram in participant's free-time they answered the following:

never (21.79%), almost never (5.12%), sometimes (3.84%), often (14.10%) and always (55.13%).

Meanwhile, the use of information consultation pages was: never (8.97%), almost never (11.54%), sometimes (41.03%), often (29.49%) and always (8.97%).

In regards to participants' digital technology use in their study scenarios the data points out that the most preferred instruments are: Information Consultation Pages (3.99), Instant Messaging (3.40), Blogs (2.09) and Snapchat (1.77)

Table 2:

Descriptive statistics on study technology use

Study use n=78	technology	N valid	Descriptive Statistics					
			Mean	Median	Min	Max	Percentiles	
							25	75
Facebook		78	1.1	1.00	1	5	1.00	1.00
Twitter		78	1.22	1.00	1	4	1.00	1.00
Instagram		78	1.53	1.00	1	5	1.00	1.00
Snapchat		78	1.77	1.00	1	5	1.00	2.25
IM		78	3.40	4.00	1	5	3.00	4.00
Vine		78	1.03	1.00	1	3	1.00	1.00
Periscope		78	1.04	1.00	1	2	1.00	1.00
Web Page		78	1.14	1.00	1	5	1.00	1.00
Virtual Environments		78	1.63	1.00	1	5	1.00	2.00
Videogames		78	1.15	1.00	1	5	1.00	1.00
Blog		78	2.09	1.00	1	5	1.00	3.00
Information Pages		78	3.99	4.00	1	5	3.00	5.00
Mean		78	1.7606	1.7500	1.00	3.1667	1.4791	2.000

Source: own work

When asked about the use of Information and Consultation pages for study use, participants answered the following: never (3.84%), almost never (5.12%), sometimes (19.23%), often (32.05%) and always (39.74%). Meanwhile, in regards to Instant Messaging for study use, the results where: never (14.10%), almost never (7.69%), sometimes (25.64%), often (29.49%) and always (23.08%).

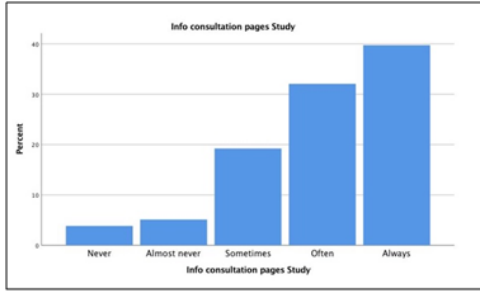


Figure 5: Information consultation pages in study
Source: own work

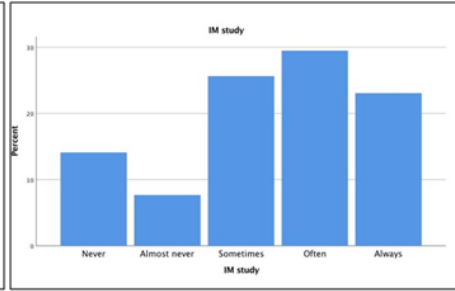


Figure 6: Instant Messaging in study
Source: own work

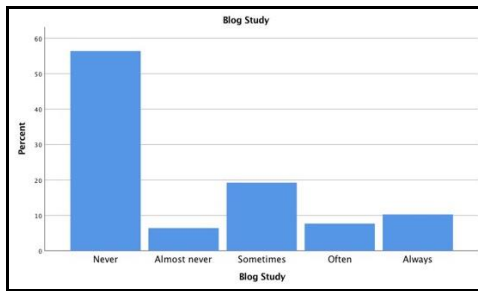


Figure 7: Blog in study
Source: own work

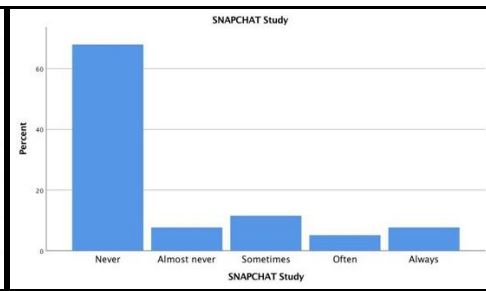


Figure 8: Snapchat in study
Source: own work

Meanwhile, the least used digital technologies were: Vine (1.03), Periscope (1.04) and lastly, videogames and Facebook (both on 1.15). The data also shows that students use technologies more in their free-time (1.519) than in their study scenarios (1.776).

CONCLUSION

The aim of this study was to describe the technology use of secondary school students in different their free-time and study scenarios. The results show that all students of this study use instant messaging and social media tools on a daily basis, in both academic and personal spaces. On the whole, students interact with more digital technologies and social media in their personal free-time than in study or

academic settings, whilst also integrating more traditional Web 2.0. tools such as blogs, which partially coincides with some previous findings (Lenhart, Prucell, Smith & Zickuhr, 2010). In parallel students mainly use technology and the Internet for leisure needs and not so much in regards to educational aims. This could lead us to include more activities and scaffold students' use of technology for academic use as well as for social and free-time use, thus bridging the gap between formal and non-formal education and promote lifelong learning strategies along with the development of essential 21st century skills.

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