"DIS-CONNECTED UNIVERSITY STUDENTS?" KNOWLEDGE AND USE OF DIGITAL TECHNOLOGIES AMONG UNIVERSITY STUDENTS

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ABSTRACT

This study identifies the knowledge and use of Information and Communications Technologies (ICT) among university students according to their fields of study and gender. The questionnaire was given to 757 students as a non-probability sampling. The results show that no differences exist between the sexes regarding the knowledge or use of ICT, nor do they differ on account of age or the means of access to university education. The study evidences the need for a real integration of ICT into the teaching practice at universities.

Key words: information and communications technologies, fields of study, gender, university, digital skills

INTRODUCTION

With social, economic, and technological changes currently taking place at a dizzying pace and in an intragenerational way, a radical metamorphosis is underway in social structures, which are under pressure in a globalized and uncertain world to keep generating creative contexts that lead to innovative processes (Fernández Enguita, 2016). In this situation there arises the profile of an idealized citizen, which some have dubbed the "knowmad" (Barak, 2017; Moravec, 2013). This is a person capable of developing creative, imaginative, and innovative contexts in situations of fluidity that mix the local with the global (or transnational) and the real with the virtual. It is in this new society, and around these axes, that the conditions for learning are seen to be changeable, fragmented, and in many instances confused (Race & Makri, 2016). A new set of skills and competences are required for the new citizenry of the 21st century. At the same time, a series of new tendencies in this "knowmadic" society must emerge (Cobo & Moravec, 2011), such as the use of informal and flexible learning methods linked to continuing education that change the "how" and the "why" of what we learn, the role played by the Information and Communications Technologies (ICT) and the new digital literacy programs, and the development of critical thinking skills in order to encourage learning in multiple and changing contexts through experimentation, observation, and pair work. Information and Communications Technologies refers to a group of technical and technological innovations that are found in three areas in particular: information technology, telematics, and audiovisuals. These fields are often combined and integrated with one another in an interactive and interconnected way, creating a wide range of multimedia applications in terms of quantity and possible uses. As such, ICT is a diverse collection of tools and technological resources used to communicate, create, disseminate, store, and administer information (Tinio, 2003).

The use of ICT is a recurrent theme in today's society—particularly since the publication of A Digital Agenda for Europe (EU4Digital Facility, 2010) and Opening up Education (Inamorata dos Santos et al., 2016)—and this is yet another reason why, since the beginning of the 20th century, ICT has been integrated into the educational system and this period has seen a transformation in ICT use from something optional to a necessity for educational processes. Teaching methods have also undergone a revolution that has allowed for the incorporation of a multitude of tools and instruments in classes, even to the point where a new interconnectivity has arisen in higher education. Digital literacy programs are shaping today's generations into a society that is highly skilled both digitally and technically (Pérez-Escoda & Pedrero, 2015), and is developing social inclusion that is similar to what was once brought about by the printing press (Cabero, 2015).

The European program for Higher Education (see Education and Training 2020 [ET2020, 2009]) supports the incorporation of LKT (Learning and Knowledge Technologies) as part of any curriculum and recognizes the need to rethink not only the knowledge but also the use of LKT by university students and to select the information to which they will have access. According to the Spanish National Agency for Quality Assessment and Accreditation (ANECA: Agencia Nacional de Evaluación de la Calidad y Acreditación), Information and Communications Technology is necessary for the teaching-learning processes, and its implementation in the higher education system is an indispensable tool for university evaluation where the roles of teacher/student, the contexts of face-to-face or distance learning, and the methods that use technological tools/resources, all lead to new concepts in teaching and learning. Following the 2004 Conference of Spanish University Rectors (CRUE: Conferencia de Rectores de Universidades Españolas) and in studies conducted to date, Spanish universities have achieved compliance with the objectives for the implantation of ICT. In 2006 a proposal was presented to improve their services by means of the use of ICT in the university system. A further report from CRUE in 2009 concerning ICT in the university system highlighted the efforts made in those years towards the effective inclusion of ICT in classroom teaching-learning. Following a period of reinvention, ICT now occupy a relevant space in the university framework and this change in mentality involves an obligatory and irreversible transition as indicated by Escofet et al. (2008), which assists flexibility in teaching, allowing it to adapt to the changes demanded by 21st century society (Kindelan, 2013).

The ICT equipment available in the classroom has improved (Mirete Ruiz, 2016), allowing for an increase in the numbers of teachers and students who can use virtual platforms and the number of distance-learning degree courses. Universities have received training in the use of ICT and have increased the technological resources and numbers of virtual training spaces (CRUE, 2014). The European Higher Education Area (EHEA), an initiative where the student is placed at the center and is key in organizing their own learning (Cabero, 2015), has contributed to the updating of the resources and the possibilities available. In this respect, numerous researchers (Levis, 2011; Mirete Ruiz, 2016; Prendes, 2011) list as one of the main challenges for universities that of including ICT in teaching-learning processes, so they become tools that generate knowledge. Currently, students have to acquire, along with the knowledge and skills of the particular subject they are studying, a series of abilities that are transversal, transferable, or general and include of analyzing and solving problems, communicating ideas and information in an efficient way, creativity, critical thinking, flexibility, and teamwork (Erstad & Voogt, 2018; Suleman, 2018; van de Oudeweetering & Voogt, 2018). As a result, there has been a rise in the demand for the employment of ICT in teaching (Heitinka et al., 2016; Mirete Ruiz, 2016), which itself has brought about a need for teachers to receive training in the application of ICT and in designing novel situations for interaction and learning.

The principal pedagogical functions of ICT can be used as tools for investigation, problem solving, and creative teaching and learning uses (Akbulut et al., 2007; Alemu, 2015). Additionally, ICT can facilitate interaction between students and teachers and aid with the design of virtual educational communities. However, the integration of ICT in teaching-learning is a gradual process (Georgina & Olson, 2008; Harris & Hofer, 2009; Shemla &

Nachmias, 2007), which is why at present there still exists a gap between ICT and pedagogy. In this respect, learning is understood not as the contents acquired by students but instead as the network of connections that can be established between nodes in order to facilitate a continuous exchange of contents, which allows for adaptation to a changing and complex environment (Sandoval et al., 2012).

At the same time, ICT is establishing a presence in teaching-learning, although in some research it has been shown that teachers still resist incorporating ICT to any great degree in their work (Hernández & Torrijos, 2018). Nevertheless, researchers continue to call for the incorporation of ICT as one of the chief tools in teaching: to learn, represent, know, transfer, and spread acquired knowledge to other people from other generations (Area et al., 2008).

As far as university students are concerned, studies suggest that they are not one homogenous digital generation but rather various profiles that differ according to the students' access with technology systems, the time that they are exposed to these systems, and the types of use made of them (Kennedy et al., 2008). It has also been found from this differentiated use of technology that, while young people may have technological skills they use in social and leisure activities, they are often unable to directly transfer these skills to their learning processes and knowledge building (Gros et al., 2012; Sainz Ibáñez, 2013). Sainz and López-Sáez (2010) look at the different ways in which men and women use ICT: while women are more active in social networks and generally search for cultural contents, men are more disposed to play video games and look for contents related to sports and computing. These different interests impact students' use of ICT and explain the more positive evaluation subsequently given by male students. Indeed, according to Valcárcel Muñoz-Repiso and Tejedor (2011), female students consider themselves to be less competent in ICT skills than in fact they are. These authors also assert that age is a factor in the use of ICT at university. Teaching staff have claimed that today's students, being from a generation born into the digital age, show greater competence in use and knowledge of ICT than they themselves do (Kenenedy et al., 2008; Masanet et al., 2019), although this idea has now been clarified. As this shows, there are impediments to achieving the goal of transforming ICT into instruments of knowledge (Levis, 2011), and it remains that the tools of technology do not alone develop pedagogical uses that enable the socio-educational adoption of resources by students. For over a decade now the point has been made that the didactic potential of such tools is determined not by the characteristics of the ICT we use but rather by the activities and tasks that the student does with them (Cabero & López, 2009).

In this study we investigated the importance of the use and knowledge of ICT for university students in all fields of study offered at the University of Extremadura (Spain). Our analysis of the variables studied herein will shed light on how to identify the resources that awaken a student's motivation and lead them to incorporate ICT into their study practices in the courses of their chosen degree.

METHODOLOGY

Our research was carried out in accordance with a quantitative methodology that is both observational and transverse in type. We gave questionnaires were to university students, and the variables we obtained were analyzed considering normality and were evaluated according to the Shapiro-Wilk statistical test. The results are described in accordance with central localization statistics (average to mean) and dispersion statistics (standard deviation or interquartile range). Immediately afterwards, we conducted a reliability study using the Cronbach statistics (Cronbach's α) and characterized the diverse variables according to the qualitative criteria of George & Mallery (2003).

The general aim of this research was to analyze the knowledge and use of ICT by university students. Some specific objectives were to analyze the knowledge presented by university students about ICT in function of their Field of Study and Gender, in function of their Field of Study segmented by Gender, and, lastly, in function of their Age, Means of Access to University, and the Time Spent Connected to the Internet per Day.

Participants

This is an intentionally nonprobabilistic sample of students in the final years of study at the University of Extremadura (UEx) in 2017. These 757 students from the provinces of Badajoz and Cáceres in Extremadura comprised 466 women (61.1%) and 291 men (38.4%), with ages between 20 and 27 (Med = 21, IQR = 2). The variable age was not normal (SW = .83, $p < .001$). All five Fields of Study at the university are represented, with almost half being from Social and Legal Sciences (n = 336, 47.1%), followed by Architecture and Engineering (n = 148, 20.7%), and Health Sciences (n = 121, 16.9%). Art and Humanities (n = 66, 9.2%) and Science (n = 43, 6.0%) were the least-represented fields. The vast majority of participants were in their third year (n = 651, 91.2%), with the rest being between fourth (n = 14, 2.0%) and fifth (n = 49, 6%) years.

Most students possessed a personal computer (n = 709, 99.3%). Of these, 680 use a laptop PC (95.2%), with 28 (3.9%) using a desktop PC. As regards the time spent connected to the internet per day, 652 students (91.33%) spent up to eight hours and only 27 (3.8%) more than nine hours. This was most commonly done with an ADSL connection (493 students, 69.0%), with 112 students (15.7%) making use of other networks and 60 students (8.4%) using a stand-alone connection via a pen drive. The vast majority of students (647 students, 90.6%) connected to the internet from home, with only 50 students (7.0%) doing so from their center of learning (Table 1).

TABLE 1. USE OF PC: TIME SPENT ON THE INTERNET PER DAY

Variable	Frequency	%
Yes	709	99.3
No	4	.6
Type of computer used		
Mostly laptop	680	95.2
Mostly desktop	28	3.9
Time spent on internet per day		
Less than 3 hours	357	50.0
Between 4 and 8 hours	295	41.3
More than 9 hours	27	3.8
Type of internet connection		
ADSL	493	69.0
Stand-alone connection (pen drive)	60	8.4
Other networks	112	15.7
Nonspecified	49	6.9
Place of connection to internet		
From own home	647	90.6
From center of learning	50	7.0

Data Compilation Instrument

The instrument used for the compilation of data was of a new design (Annex 1), with 174 Likert-type items with four response anchors (1 = none, 2 = little, 3 = some, 4 = a lot) that oblige the student to position themselves in a type of negative (none or little) or positive (some or a lot) response. There are 16 categories (Table 2) and each one is scored by adding up the following items (note, the reliability study allows for the elimination of ten items should they distort the values herein):

TABLE 2. VARIABLES UNDER STUDY

Variable	Description
Training	Level of knowledge of ICT held by students upon entry to university.
Knowledge and use	Knowledge and use of ICT made by students in their training.
Knowledge (communication)	Use of ICT as a means of communication between people.
Knowledge (information)	Use made by students of the virtual resources available in UEX.
Teaching methodology	Use of ICT by teachers in the classroom.
Advantages offered by ICT	The value that ICT hold for students.
Knowledge and use of programs	Knowledge and use of programs available to students. This set establishes the existence of two variables.
Knowledge and use of browsers	Knowledge of and use made by students of browsers. This set establishes the existence of two variables.
Knowledge and use of search engines	Knowledge of and use made by students of search engines. This set establishes the existence of two variables.
Knowledge and use of websites	Knowledge of and use made by students of websites. This set establishes the existence of two variables.
Knowledge and use of communication tools	Knowledge of and use made by students of communication tools. This set establishes the existence of two variables.

Variables in the Study

The 16 variables originally included in the study are described in Table 3.

TABLE 3. VARIABLES UNDER STUDY: 16 ORIGINAL VARIABLES AND 3 DERIVATIVE VARIABLES

Variable	Items	α_C
Training in ICT	9	.7143
Knowledge and Use of ICT	13	.8632
Knowledge of and Communication with ICT	9	.6994
Knowledge and Information on ICT	7	.8022
Teaching methodology	11	.8412
Advantages offered by ICT	15	.8742
Knowledge of IT programs	15	.8282
Use of IT programs	15	.7983
Knowledge of web browsers	9	.7423
Use of web browsers	6	.6804
Knowledge of web search engines	10	.8762
Use of web search engines	10	.8432
Knowledge of web, common usage	9	.7583
Use of web, common usage	8	.6824
Knowledge of ICT applications and tools	9	.8322
Use of ICT applications and tools	9	.7733
Overall score	164	.9621
General knowledge of ICT tools and resources	5	.8112
General use of ICT tools and resources	5	.6894
Knowledge and general use of ICT tools and resources	10	.8672

NOTE: α_C=Reliability score, Cronbach's α.
Score of Mallery & George (2003); reliability:
1-Score "excellent," 2-Score "good," 3-Score "acceptable," 4-Score "questionable"
Risk α=.05

Derivative Variables, General Variables Studied (VOEG)

Three new variables are generated as a linear combination of the last ten variables, being the General Variables Studied (VOEG) (Table 3):

- General knowledge of ICT tools and resources (five variables): S (Knowledge of IT programs, Knowledge of web browsers, Knowledge of web search engines, Knowledge of the web (common usage), and Knowledge of ICT applications and tools).
- General use of ICT tools and resources (five variables): S (Use of IT programs, Use of web browsers, Use of web search engines, Use of the web (common usage), and Use of ICT applications and tools).
- Knowledge and general use of ICT tools and resources (two variables): S (General knowledge of ICT tools and resources and General use of ICT tools and resources.

Procedure for Data Compilation

To compile the information, we first contacted the Vice-Deanship of the various Departments and Technical Schools. Having agreed upon a date and time, we distributed the questionnaire among the students; the interviewer remained in the classroom with the teacher to answer any doubts or questions.

Omissions

Any omissions in the answers were dealt with in accordance with the following criteria:

- Omissions in the personal and sociodemographic items: the respondent was asked and corrections made in situ.
- Omissions in the variables under study: the omission was maintained without making any reference to the respondent.

Outliers

The study was controlled for any possible outliers, i.e., scores that lie outside the normal data range (Palmer, 1999), which is beyond the interior limits (Figure 1).

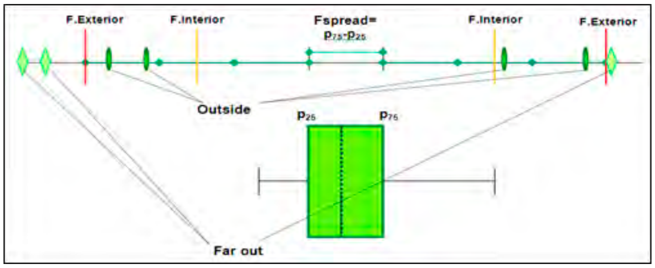

Figure 1. Limits (interior, exterior) and Outliers (outside, far-out).

Interior limits are those obtained by adding 1.5 times the Fspread to the percentile 75 and subtracting 1.5 times the Fspread to the percentile 25. The Fspread is the distance between the quarters (percentiles 25 and 75) obtained from maintaining the absolute value of the difference between both percentiles. Any score that exceeds the interior limits is considered to be an outlier. This procedure of controlling outlying scores was repeated only once.

TABLE 4. COMPARISONS OF THE VOEG WITH REGARD TO THE FIELDS OF STUDY

Variable	M	SD	H	p
General knowledge of ICT tools and resources				
Arts & Humanities	100.06	22.54	7.32	.120
Health Sciences	98.63	19.50		
Social and Legal Sciences	98.63	19.50		
Sciences	93.79	19.96		
Architecture & Engineering	94.91	17.46		
General use of ICT tools and resources				
Arts & Humanities①	95.23	17.36	10.29	.036 ①=②; ②=④ ①=③; ②>⑤, p=.022 ①=④; ③=④ ①>⑤, p=.005; ③>⑤, p=.027 ②=③; ④=⑤
Health Sciences②	93.61	14.81		
Social & Legal Sciences③	93.61	14.81		
Sciences④	90.59	15.78		
Architecture & Engineering⑤	89.31	14.75		
Knowledge and general use of ICT tools and resources				
Arts & Humanities①	195.77	35.41	12.03	.017 ①=②; ②=④ ①=③; ②>⑤, p=.024 ①=④; ③=④ ①>⑤, p=.009; ③>⑤, p=.007 ②=③; ④=⑤
Health Sciences②	192.82	29.28		
Social & Legal Sciences③	192.82	29.28		
Sciences④	184.43	30.93		
Architecture & Engineering⑤	184.26	28.54		

NOTE: M=Average, SD=Standard deviation, H=Kruskal-Wallis H test, p=Significance
Risk α=.05

TABLE 5. COMPARISONS OF THE VOEG WITH REGARD TO THE FIELDS OF STUDY: WOMEN ONLY

Variable	M	SD	Stat.	p
General knowledge of ICT tools and resources				
Arts & Humanities	99.68	24.740	.72[1]	.581
Health Sciences	96.74	19.785		
Social and Legal Sciences	97.35	19.605		
Sciences	91.52	17.149		
Architecture & Engineering	95.83	16.153		
General use of ICT tools and resources				
Arts & Humanities	95.18	18.270	4.51[3]	.341
Health Sciences	93.24	15.936		
Social and Legal Sciences	92.15	17.325		
Sciences	87.56	16.174		
Architecture & Engineering	92.84	11.485		
Knowledge and general use of ICT tools and resources				
Arts & Humanities	194.87	38.423	1.01[2]	.404
Health Sciences	190.87	31.192		
Social and Legal Sciences	189.77	32.534		
Sciences	179.08	29.263		
Architecture & Engineering	187.33	26.643		

NOTE: M=Average, SD=Standard deviation, Stat.=Corresponding statistical test: ([1]-Snedecor's F test, [2]-Welch's robust F test, [3]-Kruskal-Wallis H test), p=Significance
Risk α=.05

RESULTS

The following are the results of the study, in function of the aims set out in the paper.

Differences in the VOEG According to the Fields of Study

Based on the search for possible differences in the VOEG as per the various Fields of Study (Table 4) and, after controlling the presence of outlying scores in each of them, the following results were found:

Differences in the VOEG According to Gender

In the analysis of the differences between sexes in the three VOEG, no differences were shown in General knowledge of ICT tools and resources (p = .251), in the General use of ICT tools and resources (p = .796), or in Knowledge and general use of ICT tools and resources (p = .314). Therefore, we focused the analysis on the differences in the VOEG as a function of the various Fields of Study while taking account only of the two sexes separately. Analyzing the results as regard the differences in the VOEG in the Fields of Study (Table 5), for women only, we found there were no differences of interest when considering only the women:

On the other hand, analyzing the differences in the VOEG in the Fields of Study (Table 6) for men only, we found the following:

- There were significant differences in the case of the men in the quantity of General use of ICT tools and resources (c2 = 13.05, p = .011) in the Field of Study. Specifically, this was true in Arts and Humanities, which scored higher than those in Architecture and Engineering (p = .015), in Health Sciences, which scored higher than those in Architecture and Engineering (p = .037), and in Social and Legal Sciences, which scored higher than those in Architecture and Engineering (p = .002).
- There were significant differences, in the case of the men, in the quantity of Knowledge and general use of ICT tools and resources (c 2 = 3.55, p = .008) between the different Fields of Study. Specifically, this was true in Social and Legal Sciences, which scored higher than those in Architecture and Engineering (p = .008). A tendency towards significance was shown between Arts and Humanities and Architecture and Engineering.

TABLE 6. COMPARISONS OF THE VOEG WITH REGARD TO THE FIELDS OF STUDY: MEN ONLY

Variable	M	SD	Stat.	p
General knowledge of ICT tools and resources				
Arts & Humanities	100.59	19.46	7.50[1]	.1120
Health Sciences	101.79	18.80		
Social and Legal Sciences	100.73	22.19		
Sciences	96.94	23.46		
Architecture & Engineering	94.53	18.05		
General use of ICT tools and resources				
Arts & Humanities①	95.29	16.37	13.052	.011 ①=②; ②=④ ①=③; ②>⑤, p=.037 ①=④; ③=④ ①>⑤, p=.015; ③>⑤, p=.002 ②=③; ④=⑤
Health Sciences②	94.23	12.86		
Social & Legal Sciences③	94.71	17.50		
Sciences④	95.31	14.37		
Architecture & Engineering⑤	87.74	15.79		
Knowledge and general use of ICT tools and resources				
Arts & Humanities①	197.04	31.36	3.552	. 008 ①=②; ②=④ ①=③; ②=⑤ ①=④; ③=④ ①=⑤; ③>⑤, p=.008 ②=③; ④=⑤
Health Sciences②	196.02	25.85		
Social & Legal Sciences③	198.45	30.78		
Sciences④	192.29	32.51		
Architecture & Engineering⑤	182.91	29.37		

NOTE: M=Average, SD=Standard deviation, Stat.=Corresponding statistical test ([1]-Snedecor's F test, [2]-Kruskal-Wallis H test), p=Significance
Risk α=.05

TABLE 7. COMPARISONS OF THE VOEG ACCORDING TO TIME SPENT ON THE INTERNET PER DAY

Variable	M	SD	Stat.	p
General knowledge of ICT tools and resources				
Up to 4 hours p/d ①	94.51	19.68	8.791	<.001 ①<②, p<.001 ①=③, p=1.00 ②=③, p=1.00
From 4 to 9 hours p/d②	101.06	19.47		
9 hours and above p/d③	98.15	20.05		
General use of ICT tools and resources				
Up to 4 hours p/d	90.40	16.16	13.392	.001 ①<②, p<.001 ①=③, p=.119 ②=③, p=.662
From 4 to 9 hours p/d②	94.84	15.53		
9 hours and above p/d③	94.33	19.85		
Knowledge and general use of ICT tools and resources				
Up to 4 hours p/d①	185.87	30.30	8.491	<.001 ①<②, p<.001 ①=③, p=.641 ②=③, p=1.00
From 4 to 9 hours p/d②	195.94	30.71		
9 hours and above p/d③	193.65	35.83		

NOTE: M=Average, SD=Standard deviation, Stat.=Corresponding statistical test ([1]-Snedecor's F test, [2]-Kruskal-Wallis H test), p=Significance Risk α=.05

Differences in the VOEG in Accordance with Age and Means of Access to University

To analyze the differences in the VOEG in function of Age, this was recodified in two levels (Average = 21 years) considering the median. The analyses carried out in regard to the differences in the VOEG in function of Age, recodified in two levels (up to 21 years, 21 years and above), showed that there were no differences in the General knowledge of ICT tools and resources (p = .945), in the General use of ICT tools and resources (p = .793), nor in the Knowledge and general use of ICT tools and resources (p = .440).

To analyze the differences in the VOEG in function of Means of Access to University, this was recodified in two levels (Access by University Entrance Exam, Access by Vocational Training Course or aged above 25 years). It was shown that there are no differences in General knowledge of ICT tools and resources (p = .214), in the General use of ICT tools and resources (p = .358), nor in the Knowledge and general use of ICT tools and resources (p = .723).

Differences in the VOEG in Accordance with Time Spent on Internet per Day

The analyses carried out regarding the differences in the VOEG in accordance with time spent on the internet per day (up to four hours p/d, from four to nine hours p/d, and nine hours and above p/d) showed that there are differences in all of them (Table 7):

- There were differences in the General knowledge of ICT tools and resources (p < .001), specifically among those who connect to the internet up to four hours p/d and those who do so between four and nine hours p/d (p < .001). There were no other differences in this variable.
- There were differences in the General use of ICT tools and resources (p = .001), specifically among those who connect to the internet up to four hours p/d and those who do so between four and nine hours p/d (p < .001). There were no other differences in this variable.
- There were differences in the Knowledge and general use of ICT tools and resources (p < .001), specifically among those who connect to the internet up to four hours p/d and those who do so between four and nine hours p/d (p < .001). There are no other differences in this variable.

CONCLUSIONS

We see that university students have access to a PC, mostly laptops, and to a network. They typically do most of their academic work, using these resources, from home. There are no differences in any of the VOEG between the sexes, their Knowledge and Use of ICT being similar whether male or female.

When analyzing the influences of the Field of Study in the VOEG the differences materialize not in the Knowledge of ICT tools and resources but in their Use, and in combination with Knowledge and Use. As a result, we observe that knowledge of technology is universal and that, although such knowledge is employed in a differential manner, the entire university community is widely knowledgeable in current ITC.

With regards to the findings in the results, it is notable that students of the Arts and Humanities are those who make most use of these tools, followed by students of Health Sciences, Social Sciences and, in last place, those studying Engineering and Architecture. Of note is the fact that it is the various branches of Engineering, who in general are themselves authors, creators, and developers of ICT, that make the least use of ICT tools. In our opinion, this may be explained by the fact that these students do not require so many IT applications in their studies nor do they need them to be continually updated, but rather they need only the applications that are specific to the task and capable of resolving problems in a direct manner, such as programs of design and calculation. The greater use of ICT tools in the Arts and Humanities, Health Sciences, and Social Sciences could be explained by a wider exchange of information in these areas and the need to publish documents related to their work, to consult legislation, and to use programs for management and/or intervention, etc. In general, however, in all fields there is a continuous updating of information and modifying of the legislative or programmatical framework, such that it would be necessary to further investigate the reasons behind the specific issues raised.

If we include Gender in the equations under analysis, we could conclude that between the female students there are no significant differences in any of the characteristics analyzed. However, among the male students, there are significant differences in the General use of ICT tools and resources and in the Knowledge and general use of ICT tools and resources in function of the Field of Study, in a way that is similar to that shown to exist in the sample as a whole without Gender segmentation. The Field in which there is least Use of ICT, or Knowledge and Use of ICT, is Architecture and Engineering, with the contrary being the case for Arts and Humanities, Health Sciences, and Social Sciences. Although differences between the sexes seem not to exist, among the male students they do arise, while among the female students there appears to be a greater degree of homogeneity in so far as Knowledge, Use, and Knowledge and Use of ICT.

If we analyze the factors of Age or Means of Access to University, no influence in any of the variables analyzed can be observed: There is no particular age at which one becomes a greater user of or expert in ICT, nor are those whose access to university is via one of the existing nonacademic paths more likely to be greater users of or experts in ICT.

Lastly, those students who spend between four and nine hours per day on the internet are shown as being greater users of or experts in ICT than those who connect for only up to four hours per day, the latter group being inferior in all the variables; nevertheless, it is also evident that by increasing internet use above nine hours per day does not improve either the Knowledge or the Use of ICT. It would thus appear that the ideal amount of time spent on the internet per day should not be less than four hours, and that if it goes above nine hours there is no beneficial effect in terms of Knowledge or Use of ICT.

All the above suggests to us that a call to attention to the university teaching staff is required so that they begin to integrate digital technology into their teaching practice and adapt it to the requirements of our students. Various factors are at work in determining the incorporation of ICT in the university but, for the learning and acquisition of digital skills to improve, the faculty must play a key role in this process. Their ideas and beliefs as to the teaching uses of ICT exert a direct influence on curriculum design (De Pablos, 2018). University teaching is these days a pedagogic challenge into which we should integrate the digital transformations that are occurring in the construction of knowledge. As also mentioned in other studies, there is a need to use digital technology in academic projects to strengthen students' acquisition and development of the skills required for their use (León-Pérez et al., 2020). Equally, it is important to reorganize study programs, digital literacy among teaching staff, and technical support within the universities themselves

(Tokareva et. al, 2019). We in the university system should be fully up to speed with the digital skills needed to impart a suitable training not just in the university context where we teach but in society at large. Moreover, as part of this challenge, we must train students who can adequately function in the current world as active and involved citizens, which means having the skills necessary to interact in a world that is globalized, uncertain, interdependent, and highly complex, and in which technology plays a key role. In these digital times it is necessary to find a model of the university that reflects the digital transformation now present in all aspects of our lives and, particularly, in our students' lives.

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