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SELF-EFFICACY IN THE USE OF ICT AMONGST MATURE STUDENTS

AUTOEFICACIA EN EL USO DE TIC EN ESTUDIANTES UNIVERSITARIOS MADUROS

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ABSTRACT

Self-efficacy in the use of ICT is a key predictive variable of success for students in higher education. This study explores a range of variables related to the use of ICT by mature students – gender, age, user experience, previous training and attitude to ICT -, as well analysing the relationship between these variables and perceived self-efficacy. For this purpose, a survey was administered to 382 students who were getting prepared to enter University of Seville through one of the specific routes reserved for students over 25, 40 and 45 years. Data were scrutinised through descriptive and multiple regression analysis. Factor analysis revealed the existence of two dimensions: self-efficacy in information processing software, and Internet self-efficacy, both of them considered as dependent variables. The results showed that these two dimensions of self-efficacy are associated respectively with the use of information processing software and the Internet. Older student groups tend to feel less competent in the use of ICT, especially in relation to Internet self-efficacy. Training appears to be a relevant precursor of a

student's competence in using basic information processing software, but not for using the Internet. For mature students, competence in the use of the Internet seems to be an attitudinal issue, so a positive attitude towards ICT facilitates developing their own confidence with using the Internet. The paper concludes by stressing the need for higher education institutions to be aware of and pay special attention to the "digital divide", and to the peculiarities that older university students may present.

KEY WORDS

Adult student, higher education, inclusion, information technology, multiple regression analysis, self-efficacy

RESUMEN

La autoeficacia en el uso de las tecnologías de la información y la comunicación (TIC) es una variable clave para predecir el éxito de los estudiantes en la educación superior. Este estudio explora una serie de variables (género, edad, experiencia de uso, formación y actitudes hacia las TIC) relacionadas con el uso de las TIC por estudiantes maduros, y analiza la relación de estas variables con la autoeficacia percibida. Se aplicó un cuestionario a 382 estudiantes que preparaban el acceso a la universidad de Sevilla por las vías de mayores de 25, 40 y 45 años. Los datos fueron analizados a través de procedimientos descriptivos y análisis de regresión múltiple. Mediante análisis factorial se identifican dos dimensiones: autoeficacia en el tratamiento de la información y autoeficacia con Internet, tomadas como variables dependientes. Los resultados indican que estas dos dimensiones de autoeficacia se asocian respectivamente al uso de software para el procesamiento de información y de Internet. Los grupos de estudiantes de mayor edad tienden a sentirse menos competentes en el uso de las TIC, especialmente en relación a la autoeficacia con Internet. La formación parece ser un precursor relevante de la competencia de un estudiante en el uso de programas básicos de tratamiento de la información, pero no para el uso de Internet. Para los estudiantes maduros, la competencia en el uso de Internet parece ser una cuestión de actitud, por lo que una actitud positiva hacia las TIC facilita el desarrollo de su propia confianza en el uso de Internet. Se concluye insistiendo en la necesidad de que las instituciones de educación superior sean conscientes y presten especial atención a la "brecha digital", y a las peculiaridades que puede presentar el alumnado universitario de mayor edad.

PALABRAS CLAVE

Adulto, análisis de regresión, educación superior, estudiante, tecnologías de la información y de la comunicación, inclusión

INTRODUCTION

The student body in European higher education has undergone significant changes over the past decades leading to increased diversification of the student population (Hauschildt, Gwosć, Netz & Mishra, 2015). In Spain, those over 30 years of age account for 16% of the population of college students, which represents an increase of 8% in the last decade (MECD 2016). These changes partially obey to widening access policies at the national and institutional level that provide entry to adults who may not have previously fulfilled the minimum requirements for entry. This, in turn, is a challenge that mature students face and could be a disadvantage which can become an obstacle to their academic progress.

Digital technologies are nowadays a central element of undergraduate education (Henderson, Selwym & Aston, 2017). The incorporation of these technologies into teaching and learning has become an important component in all areas of higher education. As a result, students must deal appropriately with the use of ICT for academic demands, which will involve a certain level of familiarity with these tools. Based on Lee's (2017) argument, when it comes to online higher education, the single operation of widening the participation of mature students, such as letting students enter university by means of special quotas, does not ensure students' academic success, and one reason for that is studying at university which involves confronting a range of under-acknowledged challenges.

Research by Kennedy et al. (2010) suggests that most students actually use certain technologies like email or search engines, but only a few use advanced tools. Hargittai (2010), meanwhile, found a large variability within a group of young students in the use of the Internet and the web. In general, these investigations point to the fact that the student population is not homogeneous and there is great diversity in access and frequency in the use of technology.

It has long been argued that there is a gap between the young and mature in their skills and availability to use ICT (Premsky, 2001). According to this perspective, mature students do not belong

to the group of 'digital natives', but rather they are 'digital immigrants' who have been forced to make use of technology to adapt to the requirements, in this case, of academic life. Consequently, they are likely to lack the necessary skills and attitudes to function successfully in digitalised learning platforms and environments. However, several authors (Kirschner & De Bruyckere 2017, Margaryan, Littlejohn & Vojt, 2011) consider this view as an oversimplification that needs to be subjected to scrutiny. In this vein, some research results (Jones, Ramanau, Cross & Healing, 2010, Thompson 2013) with diverse samples have questioned the proposed digital divide and warned against the danger of sweeping oversimplifications among an entire generation. The differences between young and adults may be more of a matter of literacy and digital access than a purely generational trait. Thompson (2013) poses that immersion in digital technology may not be as dependent on age as previously suggested. People from older generations can become quite comfortable with new technologies and those from the digital native generation can restrict themselves to using only a narrow range of these tools. Jokisch, Schmidt, Doh, Marquard y Wahl (2020) demonstrated that the level of interest in technology, willingness and motivation to use it is not necessarily impacted by age. Consequently, age does not have to be the only relevant variable to explain the use of ICT, but other factors may be equally or even more important.

ICT knowledge is necessary to guarantee the usage of technology, yet it is not enough by itself, as feeling safe and competent in the use of learning technologies is of the utmost importance. The concept of self-efficacy - the belief in one's ability to organize and execute the course of action necessary to achieve a goal (Bandura 1986) - can play a key role to understand ICT-related literacy and student academic performance (Chen & Hu, 2020). Compeau and Higgins (1995) conceived computer self-efficacy as the belief that one can master a new technology or software with any degree of confidence. For these authors, self-efficacy relates to a judgement on one owns capacity to use a computer, which is determined not by previous experience, but rather by an estimation of future performance. Moreover, it does not merely refer to component sub-skills, but rather incorporates judgements about one owns capacity to apply these skills to wider tasks. It is likely that students with higher self-efficacy deploy more energy and time in developing their digital skills compared to others with lower self-efficacy. Indeed, the study by Hatlevik, Guðmundsdottir and Loi (2015) concludes that students that feel competent to complete ITC-related tasks can score better in their digital competence. The differentiation between different kinds of ICT tasks may prove useful in order to consider the self-efficacy construct from a differentiated perspective (Rohatgi, Scherer & Hatlevik, 2016). Marakas, Yi, and Johnson (1998) have distinguished between overall self-efficacy, which refers to the perceptions about one's own abilities to use the computer for different applications and circumstances, and task-specific self-efficacy referred to perceptions in the ability to perform tasks with certain hardware and/or software. In addition, Fraillon, Ainley, Schulz, Friedman & Gebhardt (2014) distinguish between self-

efficacy in basic (e.g. searching information in the web) and advanced ICT (programming and webpages building) skills. Aesaert, Voogt, Kuiper & Van Braak (2017, p. 94) define ICT self-efficacy as the collection of "a student's individual beliefs of his ability to explore digital information, and to communicate using the computer and the Internet".

As for the variables associated with ICT self-efficacy, studies on possible gender differences show conflicting results. On the one hand, several studies (Arrosagaray, González-Peiteado, Pino-Juste y Rodríguez-López, 2019, Scherer & Siddiq, 2015) found a difference in favour of men, in the sense that they show, in general, greater self-efficacy and a more positive attitude towards the use of ICT, while women displayed less confidence in their abilities, especially in the more complex tasks. On the other hand, other studies point to a certain equivalence between genders (Fraillon et al., 2014, Hammond, Reynolds & Ingram, 2011, Tezci 2011), so that women and men demonstrate similar willingness and capacity to use the Internet. Interestingly, Cai, Fan and Du (2017) carried out a meta-analysis with a sample of 50 studies published between 1997 and 2014 and found that males still hold more favourable attitudes towards technology use than females, but such a difference would be characterised by small effect sizes. In addition, gender bias in research methods (Hatlevik, Scherer & Christophersen, 2017) and the influence of socialisation, could also explain the disparity of previous findings regarding gender differences.

Also, experience or previous use of ICT can be an important factor in explaining greater self-efficacy. In general, previous experience shows high correlations of previous computer experience with ICT self-efficacy (Hammond et al., 2011, Malliari, Korobi & Togia, 2012), but its influence may vary depending on the type of computer application. According to Rohatgi et al. (2016), ICT self-efficacy is positively correlated to the ICT use for recreation as well as the ICT use for task learning. Tezci (2011) suggests that the development of good self-confidence in ICT depends partly on having positive previous experiences. In this vein, some studies have focused on analysing the relationship between training in the use of ICT and self-confidence. Among them, the work of Torkzadeh and Van Dyke (2002) found that training improves previous computer and Internet self-efficacy. Also, Smith, Caputi, and Rawstorne (2000) found that confidence with computers was related positively and significantly to prior training in a sample of undergraduate students. Evidence from all these studies shows that factors such as prior experience, attitudes, and self-efficacy are loosely related to each other.

As for the relationship between age and self-efficacy, contrary to general assumption, there is no clear evidence that younger students use ICT more frequently or proficiently than older ones (Kennedy et al., 2010). Rather, there is great variability amongst the general student population (Hargittai, 2010), and within mature students in particular (Jones et al., 2010). As with the general population, ICT self-efficacy amongst mature students seems to relate positively with the level of use

and moreover, it can become a motivating factor for adults in the use of ICT (Tufts, 2010). The study by Cabero and Llorente (2020) evidences that older people also manifest a strong desire to learn to use computers and the internet. Similarly, older people involved in learning about computers become more confident with the use of ICT and develop more positive attitudes toward both using and learning to use them (Gonzalez, Ramirez & Viadel 2015). According to Kennedy et al. (2010), research must move beyond the mere identification of generational differences and examine instead other factors that may influence the students' use of ICT. A greater understanding is needed of how the diversity within the student population interacts with how technology is used, and the reasons for this diversity.

Purpose of the present study

The literature review indicates that perceived self-efficacy in the use of ICT is a key predictive variable of, and a motivating factor for, the successful use of these tools in the learning environment (i.e. Hammond et al., 2011, Tufts, 2010). Because of the fast development of ICT in the last decades, it is likely that important differences will be found in the way it is perceived across younger and older students, and that their experience and digital skills can potentially be influenced by a generational factor, but not in its entirety. Yet, given the wide range of applications and tools that are currently deployed in educational settings, different dimensions of self-efficacy are likely to become more relevant depending on the aspect of ICT considered. However, most investigations around ICT self-efficacy have considered it as a single dimensional construct; yet, task-specific self-efficacy (Marakas, 1998) may prove as a more useful frame for interpretation.

This investigation aims to identify the factors that are associated to positive ICT self-efficacy in a sample of mature students during their access transition year to university. Specifically, we explore to what extent gender, previous use, training, attitudes towards ICT and age can explain ICT self-efficacy. This will make it possible to define the profile of the mature student population that requires most support and what their needs are concerning their digital skills and literacy, which is a crucial element for their ultimate success.

METHOD

This research is based on an *ex-post facto*, descriptive and explanatory design, based on survey methods.

Participants

The definition of 'mature student' is related to the age of access to higher education and changes between countries and even between institutions. In the Spanish context, this category includes those over 25 years old who previously abandoned the educational system without the minimum requirements for entry into higher education. Participants in this study are those: a) who were 25 years or older, b) were enrolled in one of the three routes that the Spanish educational system establishes for mature people that have abandoned education without completing the minimum requirements for entry into higher education, and c) were registered in the entry foundation course at the University of Seville in the year 2012. This course is delivered in a full and part-time basis to those that enter university through one of the specific routes reserved for students over 25, 40 and 45 years of age. Routes for mature students who want to enter university require passing an examination (this is the case for the 25 and 45 years old) or completing a skill-assessment interview (for those over 40 who have professional experience). In all cases, candidates have not selected a field of study yet as the choice of a degree is subsequent to passing the examination or interview.

A total of 382 students completed a questionnaire as detailed in the section below. The gender and age representation of the final sample is presented in Table 1.

Table 1
Participants

Variable	Percentage
Gender	
Men	44.8
Women	55.2
Age	
25-35	39.2
36-45	23.7
46-55	31.3
>55	5.8

Variables and measure

A paper-based questionnaire was used to collect data relating the variables considered in this study. The pilot version of the survey instrument was reviewed by a team of independent experts, who

provided qualitative feedback on the validity of the items.

The dependent variable is ICT self-efficacy. In this study we adopt a definition of self-efficacy that is grounded in the literature reviewed and the description of self-efficacy by Aesaert et al. (2017) as the confidence that students have in their own ability to use computer tools in the academic environment and perform in digital contexts, both from an social and educational perspective. This definition drives the selection of aspects used to measure the concept. Specifically, seven of the items in the survey relate to the students' confidence in their own digital skills: spreadsheets; word processing; presentation software; graphic and multimedia software; social networks; Internet browsing; and virtual learning environments. Participants stated their perceived level of self-efficacy in each of these indicators using a Likert-type scale ranging from 0 (minimum skill) to 4 (maximum skill). Each of the seven items have been subjected to exploratory factor analysis to identify the underlying dimensions of the perceived self-efficacy construct. Principal components analysis was used to extract factors, followed by varimax rotation so as to minimise the number of variables with high loads, thus facilitating interpretation. Bartlett's test of sphericity shows a value of 895.54 ($p<.001$), which confirms the existence of significant correlations between variables. Also, the Kaiser-Meyer-Olkin measure of sampling adequacy renders a value of.820. The matrix of correlations has been found to be applicable to the main component analysis (PCA), factor analysis has been performed next. Two components have been found to explain the 64.74% of the total variance. Next, we have performed a varimax rotation with the goal of clarifying the interpretation of the factors. The variables with the highest loadings in the first dimension are related to the students' perceived skills in relation to commonly used software like spreadsheets (.865), word processors (.784), presentations (.803) and design (.487). This dimension is therefore identified with self-efficacy in information processing, where high scores imply a strong perceived capacity to use this software, and low scores imply a low perceived ability. The variables that weigh the most in the second component relate to the perceived ability in the use of social networks (.828), Internet browsing (.761) and virtual learning environments (.665) (also known as learning management systems); therefore, this second component has been identified as Internet self-efficacy. The factor analysis scores are therefore indicators of different dimensions of ICT self-efficacy. Finally, α of Cronbach is .80 for self-efficacy in information processing and .68 for Internet self-efficacy, values that can be considered acceptable considering the small number of items included in each of them, and therefore support the reliability of both scales.

The literature review informed the inclusion of gender and age as independent variables, and also the following variables which were measured in the survey:

- *Attitudes towards ICT*. These attitudes were measured according to the participants' agreement with a series of nine statements (e.g., *I find ICT useful to keep up to date*, *I am positive and*

keen on taking the initiative to experiment with ICT, etc.) using a five-point Likert scale from 0 (complete disagreement) to 4 (complete agreement). These ten items were reduced through principal component analysis (Bartlett's sphericity test renders a value of 2986,11, p <.001 and the measure of sample adequacy is found to be .94). Resulting from this analysis, we have obtained a single factor which explains 70.65% of the total variance. The weightings of each of the ten variables in this factor are high and positive, ranging between .66 ('I wish to include the use of ITC in my learning process') and .92 ('Using ITC affords me tools and resources to learn'). The factor scores of individuals are interpreted as indicators of their attitudes to ICT. The reliability of the scale of attitudes towards ICT was placed at the value $\alpha = .95$, although this result been influenced by the conceptual proximity in the formulation of some of the items.

- *Training in the use of ICT*. This study has included seven dichotomic variables to register if participants received (1) or did not receive (0) training in the following: 'software for presentations, word and graphic processing'; 'e-mail and/or instant messaging'; 'Internet access and navigation'; 'use of social networks'; 'virtual learning environments'; 'use of forums, chats or wikis'; and 'design of webpages and blogs'. The seven variables informing the formal training in ICT received by mature students have been reduced through PCA, replicating the procedure that was applied to those variables relative to ICT self-efficacy and attitudes to ICT. The matrix of correlations has been found to be suitable to apply PCA (Bartlett's sphericity test showed a value of 658.06 ($p<.001$) and the measure of sample adequacy rendered a value of .81). The factor resulting explains 44.27% of the total variance, and factorial weightings range from .55 (use of discussion forums and chats) to .76 (Internet access and navigation). The reliability of the scale reached a Cronbach's α value of .78.
- *Experience with ICT*. This variable has been measured through eight items gathering information on the frequency in the use of each of the following resources: 'Internet browsers; 'email'; 'search engines'; 'social networks'; 'word processors'; 'spreadsheets'; 'presentations'; and 'graphic and image software'. For each, participants were requested to respond in a five-point Likert scale stating 'never' (0), 'rarely' (1), 'monthly' (2), 'weekly' (3) and 'daily' (4). The matrix of correlations for this group of variables is appropriate for factorial analysis (Bartlett's sphericity test rendered a value of 922.89, $p<.001$, and the measure of sample adequacy resulted in 0.78), so two factors were extracted through PCA which jointly explain 58.53% of the total variance. The variables saturating most in the first factor refer to the frequency in the use of spreadsheets (.831), presentations (.806), word processors (.785) and graphic and image processing software (.647). This dimension is identified as experience in the

use of software for information processing, with high scores implying a high use of the mentioned software. The highest loadings in the second component correspond to information searches (.793), messaging (.733), browsers (.723) and social networks (.592). Therefore, we identify this second dimension with experience in the use of the Internet. Taking the factorial scores, for each participant we have measurements in both constructs. The Cronbach's α values for each of these two subscales are .79 and .57 respectively.

and age representation of the final sample is presented in Table 1.

Procedure

Having sought ethical clearance for the study, data collection took place in two different iterations. Firstly, the questionnaire was applied to an incidental sample of students attending the foundation course for access to university in one of their face-to-face sessions. Secondly, this sample was enlarged with an online version of the survey, which was distributed to all students enrolled in the foundation course at the time.

Statistical analysis

Data collected was analysed through an ad-hoc descriptive and explanatory analysis. Data analysis consisted of a descriptive account of the variables including frequency distribution, mean and standard deviations. Next, multiple linear regression analysis jointly accounts for the positive associations found between the variables proposed and perceived self-efficacy in the use of ICT. This analysis has considered both self-efficacy components (self-efficacy in information processing and Internet self-efficacy) as the dependent variable in each of the models; while including gender, age, attitude towards ICT, training, and experience of ICT as independent variables.

In the case of the attitudes towards ICT and training and experience ICT variables, the factorial scores in each of the dimensions identified by the measurement instruments were taken for each participant.

RESULTS

ICT self-efficacy, attitudes, competency and experience of mature students in ICT

According to the results, mature students entering higher education who participated in this study feel moderately confident in their own capacity to use ICT (see Table 2). In a scale ranging from 0 to 4, most items average around the central value, although respondents perceive themselves most

competent at browsing and using the Internet (mean=3.27) and word processing (mean=2.89); and least competent in using image editing and design software (mean=1.28).

Table 2
Mean and standard deviation for ICT self-efficacy variables

Level of competence in…	Mean (SD)
Spreadsheets	2.00 (1.25)
Word processing	2.89 (1.12)
Presentations	2.03 (1.32)
Design	1.28 (1.26)
Social networks	2.23 (1.48)
Browsing and using the Internet	3.27 (.94)
Virtual learning environments	2.09 (1.35)

Mature students show a generally positive attitude towards ICT, as demonstrated by the high level of agreement with a series of related statements (see Table 3). In a scale ranging from 0 to 4, all items average well over the central value. Most notably, participants agree with the statements that (a) ICT is a useful way to keep up to date (mean=3.11), (b) it provides resources and tools to learn (mean=3.03), and (c) students wish to integrate it in the learning process (mean=3.03). The statement 'I am very keen and enthusiastic about using ICT' has achieved the lowest score (mean=2.15).

Table 3
Mean and standard deviation for attitudes towards ICT

Item	Mean (SD)
ICT is a useful way to keep up to date	3.11 (1.16)
I am very keen and enthusiastic about using ICT	2.15 (1.22)
Using ICT enhances my learning experience	2.82 (1.23)
Using ICT helps me in the learning process	2.92 (1.21)
Mastering ICT is indispensable to continue my studies and/or improve my employment opportunities	2.93 (1.23)
ICT provides me with resources and tools to learn	3.03 (1.17)
I feel motivated by the use of ICT	2.50 (1.31)
Mature students are equally prepared to use ICT	2.58 (1.36)
I wish to integrate ICT into the learning process	3.03 (1.24)

A minority of the surveyed sample received formal training in a variety of ICT tools and software. While 42.48% have formally developed skills in word/graphic processing and presentation, those that have availed of formal training in the use of email/instant messaging and the Internet use/navigation are in the minority (28.04 and 26.46% respectively). Even less have received formal training in the use of virtual learning environments (19.89%) and website/blog design (13.76%). Very few students have received formal training in relation to communication tools, including the use of chat (4.53%) and social networks (8.73%).

Finally, the experience with ICT of this mature student sample was explored. The stated frequency of the use of diverse ICT tools is shown in Table 4. Use of e-mail, browsers, and information searches are the most frequent activities, performed by 85% of the respondents on a daily basis. The least frequently used are software for graphic and image processing, which are never or rarely used by a third of respondents (65.7%), and software for presentation design, never or rarely used by 55.1% of respondents.

Table 4
Frequency in the use of ICT tools by mature students (percentage)

	Never	Rarely	Monthly	Weekly	Daily
Internet browsers	1.8	2.1	2.4	8.9	84.7
E-mail	0.8	1.3	1.6	11.3	85.0
Information searching	0.8	1.3	1.6	12.6	83.8
Social networks	22.5	9.9	4.2	23.3	40.1
Word processors	3.7	12.0	12.6	27.2	44.5
Spreadsheets	18.6	24.9	13.4	17.3	25.7
Presentations	20.7	34.4	19.4	16.3	9.2
Image and graphic processors	27.2	38.5	18.3	8.6	7.3

Relevant variables in the explanation of ICT self-efficacy

In order to identify the variables that appear associated to ICT self-efficacy in mature students, two regression models were built (see Table 5) where the two identified ICT self-efficacy dimensions are dependent variables: self-efficacy in information processing (Model 1) and Internet self-efficacy (Model 2). Both models are statistically significant, with $F(6, 347) = 60.330$ ($p<.001$) and $F(6, 347) = 37.110$ ($p<.001$) respectively. R^2 adjusted values, corresponding to the proportion of the variance that is explained through each of the regression models, are .502 (Model 1) and .380 (Model 2). With regards to the beta coefficients obtained for Model 1, experience in using information processing software ($\beta=0.646$, $p<0.001$) and training in ICT ($\beta=0.200$, $p<0.001$) contribute most to the explanation of self-efficacy in the use of information processing software. The negative association of age with self-efficacy in information processing software is also significant ($\beta=-0.106$, $p<0.01$), this is, information processing software self-efficacy slightly decreases as participant age increases. Experience in the use of Internet contributes similarly, in this case positively ($\beta=0.106$, $p=.01$), so a greater use of Internet is associated to more self-efficacy in information processing. Gender and attitudes towards ICT have not been found to be significant variables for this model.

The variables associated with information processing software self-efficacy do not appear, however, associated with Internet self-efficacy in the second regression model. Instead, age is the most strongly associated variable ($\beta=-0.345$, $p<0.001$). As the relation is negative, age increases imply a decrease in Internet self-efficacy in this sample. The effects corresponding to attitudes to ICT have also been found to be significant ($\beta=0.280$, $p<0.001$) and experience with Internet use ($\beta=0.274$), both in a positive direction. Gender, training in ICT and experience with information processing software do not show a statistically significant association with Internet self-efficacy.

Table 5
Regression models for ICT self-efficacy

	Model 1				Model 2			
	Information processing software self-efficacy Adjusted R^2=0.502				*Internet Self-efficacy* Adjusted R^2=0.384			
	B	Std. Error	Beta	Sig.	B	Std. Error	Beta	Sig
(Constant)	.108	.149		.472	.597	.168		.000
Gender	.071	.078	.035	.362	.085	.087	.042	.333
Age	-.110	.042	-.106	.009	-.357	.047	-.341	.000
Attitude towards ICT	.009	.041	.009	.834	.288	.046	.289	.000
Training in ICT	.196	.040	.199	.000	.031	.045	.031	.491
Experience with basic software	.641	.041	.645	.000	-.023	.046	-.023	.612
Experience with the Internet	.103	.041	.104	.011	.271	.046	.270	.000

DISCUSSION

Mature students' access to higher education involves overcoming a series of challenges. The growing permeation of ICT in the university setting involves the additional challenge of developing the skills required to use diverse digital tools and virtual learning environments. This study has focused on how mature students perceive themselves in relation to their own ICT competence while taking a multivariate approach. The first emerging conclusion relates to the complexity of the ICT self-efficacy construct, in the same direction pointed by previous research (Fraillon et al., 2014, Marakas et al., 1998, Rohatgi et al., 2016). In this case, two factors or dimensions have been identified and defined as self-efficacy in information processing software, and Internet self-efficacy.

Our sample of mature students achieved higher scores in the Internet self-efficacy variable. This self-efficacy dimension is associated to a higher level of experience by students in the use of information searching and communication tools (search engines, social networks, browsers, etc.). Self-

efficacy in information processing software is also strongly associated with the frequency in the use of spreadsheets, word processors, graphic and image processing software, and presentation design software. Therefore, our results coincide with other investigations on the relationship between frequency in the use of ICT and perceived self-efficacy (Hammond et al., 2011, Tuffs 2010).

Previous training and attitudes towards ICT play an interesting role in explaining self-efficacy. Training appears to be a relevant precursor of a student's competence in using basic information processing software, but not for using the Internet. This result contradicts previous findings by Torkzadeh and Van Dyke (2002), who found that training improves both computer and Internet self-efficacy. For mature students, competence in the use of the Internet seems to be associated with an attitudinal issue, so a positive attitude towards ICT facilitates developing their own confidence in using the Internet.

Both dimensions appear disassociated from the gender variable, thus confirming other results obtained from traditional student populations, which have found comparable self-efficacy scores for both genders (Tezci, 2011). Similarly, our results showed that older students felt less competent in the use of ICT, especially in relation to Internet self-efficacy. This can be partially due to their lower use of ICT compared to the general population, as found by Román-García, Almansa-Martínez and Cruz-Díaz (2016). Age as a variable is especially relevant in the interpretation of these results, as the age range is wider in mature student populations when compared to traditional ones (Jones et al., 2010). Although mature university students are not a homogeneous group with intrinsic and static characteristics (Lee, Choi & Cho, 2019), many of those returning to formal education after being away from academic life face a very different learning environment, where the use of ITC is pervasive. Given that mature students' confidence in their own ability to use ICT effectively is key to ensuring their successful integration into university life, there is a need to promote the development of ICT self-efficacy in this population, especially among older students.

The results of this research show that specific training in the use of information processing software could contribute to ICT self-efficacy and attitudes towards ICT. As Lee (2017) suggests, widening the participation of mature students to meet special quotas does not ensure students' academic success. It is also necessary providing genuinely accessible HE opportunities that meet students' diverse needs. Therefore, higher education institutions need to pay special attention to the "digital divide" when delivering online learning. This divide does not necessarily impact all mature students, as this study has found that those who feel less competent in the use of ITC, especially in relation to Internet use, are amongst the older age groups. Kember, Leung and Prosser (2019) show that students who study online are more likely to drop out than face-to-face students, and mature students, among other groups, often have no choice but to study online. Recent research in Spain shows

that mature students and students who combine their employment with study (Constante-Amores, Florenciano, Navarro & Fernández-Mellizo, 2021, Tuero, Cervero, Esteban & Bernardo, 2018) have a higher risk of dropping out of university. Therefore, if not accompanied by effective guidance interventions, policies aiming at improving university access for disadvantaged students can turn university access into a "revolving door" where students leave as soon as they have arrived due to factors under university control.

However, the inherent limitations of correlational studies must be acknowledged, which excludes the possibility of deducing the existence of causal relationships that strongly support the need for interventions around ICT. It is also important to note that the participating sample was not randomly selected, as it is often the case when survey methods are deployed. This being said, it is noticeable that the demographic characteristics of the participants are sufficiently heterogeneous to support the representativeness of the sample.

Future investigations can compensate for these limitations by moving beyond the exploratory approach of correlational studies through the use of quasi-experimental designs that offer the possibility to draw causal relationships between ICT self-efficacy and its determining factors. In any case, there is a strong need for additional studies on how institutions are working to increase student capacities to succeed in higher education environments which are increasingly characterised by the utilisation of blended and online approaches (Graham, Woodfield & Harrison, 2013). Hence, we need further research on what challenges mature students are facing with ICT that can impact their effective participation in higher education in general, and online education in particular, so that we can identify proactive actions to promote their transitional adjustment and success.

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