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Perception of Sports Science Students in Higher Education on Basic Digital Competences: Spanish Case

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Abstract: In order to improve the teaching–learning process at the university level, it is essential to consolidate students' digital competences (DCs) during their initial training. This development is analysed in the area of sports management as part of the physical activity and sports science (CAFyD) bachelor's degree. Students (n = 236) from private (n = 120) and public (n = 116) universities participated by completing the COBADI questionnaire (registered trademark: 2970648®), structured into three dimensions: (I) Competences in knowledge and use of ICTs in social communication and collaborative learning; (II) competences in the use of ICT for information search and processing; and (III) virtual and social communication tools of the university. Likert scale responses ranged from 1 to 4 points. The results show significant differences in terms of the type of university. In terms of gender, females have a better digital perception, with a significant difference (. . . I know how to use programs. . .). This pioneering research is of relevance for higher education professors in the field of sports, as it helps to detect areas where students lack DCs and engages them in the enhancement of their learning.

Keywords: digital competence; technology training; sport; university; learning strategies

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1. Introduction

The arrival of the European Higher Education Area (EHEA) encouraged methodological updating in university classrooms, spurred by a new learning paradigm that seeks to promote the active role of students through the support of digital technology [1]. One of the key elements was the incorporation of students' digital competence (DC), defined as 'The combination of knowledge, skills and attitudes for the safe and critical use of technology in the information society for work, leisure and communication. A competence that builds on the basic competences in Information and Communication Technologies (ICTs): the use of computers to retrieve, evaluate, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet' [2]. Since then, there has been exponential growth in the use of ICT in higher education, as an enabler of new learning experiences [3–7]. This approach, following the impacts of COVID-19, has had far-reaching effects on higher education institutions [8,9].

In this regard, university students are expected to possess the required digital proficiency to confront the requirements of the evolving educational paradigm and to address the forthcoming labour market challenges [10]. Furthermore, it is necessary to pay attention to the role of these students as future professors, being necessary in the case that they are able to analyse and assess the pedagogical use of ICT and the development of digital competences, to allow them to transform the student's role as well as their own [11]. Therefore, despite its fundamentally practical nature, the area of physical activity and sports is not immune to these dynamics [12], highlighting the importance of the integration of

ICT in the training process in this area, and the requirements of students and teachers according to current social dynamics [13]. In the case of students pursuing a physical activity and sports science (TUCAFyD) university degree in Spain, the response to the resolution from 18 September 2018 recommends that universities carry out verification reports of the TUCAFyD [14], where seven competences are established. For example, in the seventh competency, titled, "Performance, deontology and professional practice in the context of interventions", it is indicated that students should "... know how to explain and disseminate the functions (...) of a good professional (...) as well as analyse, understand, identify and reflect critically and autonomously (...) the professional performance to achieve the purposes and benefits of physical activity and sports in an appropriate manner (...)", for which they need to use the possibilities offered by the Internet of Things (IoT), which the EU urges citizens to develop [15].

'Connectivism' is considered important in the pursuit of learning based on full and authentic educational experiences that allow for the promotion of DCs in university students, as indicated by the learning theory of the digital age and, thus, of today's digital natives [16]. In this paradigm, learning is acquired by connecting specialised information and the knowledge acquired in the current era of social interaction [17]. This theory considers it essential to reflect on and analyse the elements that determine learning. Among them, we find the personal learning environment (PLE), defined as the set of tools, services and connections through which we learn, exchange, and share information and experiences [18,19]. According to Adell and Castañeda [20], it is important for students' PLEs to be built on three elements: reading tools and strategies, reflection tools and strategies, and relationship tools and strategies. The latter, in turn, make up the personal learning network (PLN), based on relational tools and strategies for sharing experiences, where the most important aspect is the people with whom one interacts and generates knowledge [18,21,22].

Nowadays, it is considered necessary to analyse the use of digital tools by university students in order to discover what constitutes their PLE or PLN as a learning resource, as well as to know what their needs are in relation to the use of digital technology [23,24]. This, in turn, would allow us to rethink the links between pedagogy, technology, and education by assuming that the appropriate configuration of this trilogy can be crucial in enhancing the quality of their university education [25–28]. In addition, it could be perceived as training that prepares students to excel in highly digitised future professional performances [1,29]. Consequently, authors such as Esteve and Gisbert [1] affirm the importance of exploring the use of technological support tools and the DC of university students, with proficiency in this competency being essential at the end of their studies. It is necessary to create a PLE composed of a set of tools, services, and connections with which students learn and exchange learning experiences, as it can be profitable for university students when they use it, as well as useful throughout their lives. Therefore, there is a growing need to understand the perception of university students themselves, which in turn provides insights into how to link theory with practice, and the academic world with the real world, leading students to create their own knowledge and share reflections and experiences with others [30,31].

Recent studies have analysed the perception of university students with respect to three competences, which, in turn, are essential for understanding the students' PLE. These competences are those related to the knowledge and use of ICT in social communication and collaborative learning, the use of ICT for information search and processing, and the use of virtual and social communication tools of the university. Among these studies, Vázquez-Cano et al. [32] analysed the differences in the basic DCs of university students enrolled in bachelor's degrees in social education, social work, and pedagogy. The results showed that, in general, males perceived themselves as more competent than females in using ICT for information search and processing, for example, when producing online presentations as digital content. In addition, they highlighted that females perceived themselves as more competent than males with the university's virtual and social communication tools. In this

sense, they were more willing to ask for personal tutoring to solve doubts about the use of technological tools and were more likely to use corporate email than male students.

However, the same authors, in another study, found that both males and females were equally competent in different DCs [33]. Also, Conde et al. [34] analysed the DCs perceived by students pursuing a bachelor's degree in physical activity and sports science in Colombia. The results showed a high percentage of students who used tools to search for information related to university tasks (78%), academic activities (63%), and/or consulted academic and professional topics. Similarly, Rosa et al. [35] confirmed the high level of ICT usage by students, approximately 9 h per week, with the computer being the most widely used connection tool at home, and the smartphone outside of it. In addition, they corroborated differences in the perception of the basic DCs of university students when analysed according to gender. The results highlighted that male students spent less time using ICT for academic tasks, in favour of time spent playing video games. Vázquez-Cano et al. [36] also highlighted the high perception of knowledge and the high use of ICT in social communication and online collaborative learning, especially through mobile devices.

Despite the research carried out to date, the state of digital transformation of Spanish universities is a controversial issue, especially after facing, in record time, the challenge of shifting from face-to-face teaching to online or hybrid teaching as a consequence of the COVID-19 pandemic [37]. The impacts of COVID-19 have had far-reaching effects on higher education institutions [38]. Ultimately, few studies to date have reported on the perceptions of university students in the context of the COVID-19 era [9]. For all of these reasons, the aim of the present research study was to discover the degree of knowledge and training on basic digital competences possessed by students pursuing a bachelor's degree in physical activity and sports science during the COVID-19 period.

2. Materials and Methods

2.1. Design

Data on students' DC knowledge were collected through a descriptive, quantitative, and cross-sectional research approach.

2.2. Participants

A total of 236 students from two Spanish universities, one public and one private (Table 1), took part in the study (Mage = 22.10, SD = 4.99). The type of sampling was probabilistic stratified and proportional to the highest year in which the students were enrolled. When we explored the students' training on the use of digital technology, we found that 94.50% had not received any training on Web 2.0 or social software. Regarding the frequency of use (hours) of the internet, the most outstanding value was that 30.90% of students were "continuously surfing", 27.10% used the internet for more than 9 h per week, and 22.50% used it for more than 20 h per week.

Table 1. Descriptive statistics of the participants.

Variables		*n*	%
Gender	Male	176	74.60
	Female	60	25.40
Type	Public	116	49.20
	Private	120	50.80
Course	First	64	27.10
	Second	35	14.80
	Third	106	44.90
	Fourth	31	13.10

Table 1. *Cont.*

Variables		*n*	%
Training on Web 2.0 or Social Software	Yes	13	5.50
	No	223	94.50
Frequency of internet use	1 to 3 h per week	9	3.80
	4 to 9 h per week	37	15.70
	More than 9 h per week	64	27.10
	More than 20 h per week	53	22.50
	I am constantly surfing	73	30.90

2.3. Instruments

The "Basic Digital Competences 2.0 of university students" COBADI 2013 questionnaire (registered trademark: 2970648®) was used [39]; it consists of 28 items that assess the perceptions of university students on three dimensions: (DI) competences in knowledge and use of ICTs in social communication and collaborative learning (13 items); (DII) competences in the use of ICT for information search and processing (11 items); and (DIII) virtual and social communication tools of the university (4 items). The response scale was Likert-type, ranging from 1 (I feel completely ineffective in performing what is presented) to 4 points (I feel that I completely master what is presented). This questionnaire also includes four sociodemographic questions (age, gender, university, and academic year). The internal consistency of the instrument was adequate, reaching a value above 0.80 (α Cronbach = 0.82) [40]. This questionnaire has been validated and used in several research studies in university contexts [36,41,42].

2.4. Procedure

Data collection was carried out over a period of three weeks (from 16 April 2021 to 5 May 2021) during the 2020–2021 academic year. This research received the approval of the corresponding ethics committee (code TC/05-21) from UCAM University. The questionnaire was sent to participants digitally via the Google Forms® survey tool. There was no restriction on participation, and the questionnaire was distributed to the first-, second-, third-, and fourth-year students pursuing a bachelor's degree in physical activity and sports science at each university. There was no academic or financial incentive for them to take part in the study. Likewise, the anonymity policy regarding the treatment and analysis of the data was guaranteed.

2.5. Data Analysis

The distribution of data was analysed using the Kolmogorov–Smirnov test, obtaining a value of less than 0.05. Therefore, non-parametric statistical tests were used for the corresponding analysis of the data. In order to achieve the objective of the study, two analysis types were carried out. Firstly, a descriptive analysis of the quantitative variables (frequencies, percentages, means, and deviations); secondly, the Mann–Whitney U test was used for the analysis of the difference in means, and Rosenthal's r test for the magnitude of the effect. The statistical analysis was performed with the SPSS® Statistics v. 27.0 statistical package.

3. Results

The descriptive results of this research are presented below, according to the different dimensions that shape the questionnaire: (DI) competences in knowledge and use of ICTs in social communication and collaborative learning, (DII) competences in the use of ICT for information search and processing, and (DIII) virtual and social communication tools of the university. Likewise, the analysis examines the relationship between variables according to gender and the university of enrolment.

Dimension I: Competences in knowledge and use of ICTs in social communication and collaborative learning.

The descriptive results of DI showed that 67.4% of respondents perceived that they had completely mastered the use of chats for interacting with others (3.44 ± 0.94), 66.5% felt the same about email (3.45 ± 0.91), 59.3% for social networking (3.41 ± 0.85), and 56.4% for instant messaging (3.24 ± 1.05). In contrast, they considered themselves completely ineffective in the use of social bookmarking and tagging (36.4%; 1.92 ± 0.03), really simple syndication (RSS) (34.7%; 1.86 ± 1.07), and designing, creating, and modifying wikis (33.9%; 2.03 ± 0.97) and blogs (32.6%; 2.05 ± 0.97) (Table 2).

Table 2. Descriptive statistics on the perception of competences in knowledge and use of ICTs in social communication and collaborative learning (DI).

Variables	M(SD)	1. Completely Ineffective	2	3	4. Complete Mastery	DK/NO
		f (%)	f (%)	f (%)	f (%)	f (%)
I can communicate with other people by e-mail.	3.45 ± 0.91	16 (6.8)	19 (8.1)	43 (18.2)	157 (66.5)	1 (0.4)
I use the chat to interact with other people.	3.44 ± 0.94	18 (7.6)	20 (8.5)	38 (16.1)	159 (67.4)	1 (0.4)
I use instant messaging as a tool to communicate with other people.	3.24 ± 1.05	25 (10.6)	28 (11.9)	40 (16.9)	133 (56.4)	10 (4.2)
I can communicate with other people by participating in social networks (Ning, Facebook, Twitter, Hi5, Myspace, Tuenti, etc.).	3.41 ± 0.85	12 (5.1)	20 (8.5)	60 (25.4)	140 (59.3)	4 (1.7)
I am able to manage professional networks (LinkedIn, Xing).	2.58 ± 0.95	27 (11.4)	82 (34.7)	66 (28.0)	44 (18.6)	17 (7.2)
I am able to participate appropriately in forums.	2.81 ± 0.90	19 (8.1)	61 (25.8)	91 (38.6)	56 (23.7)	9 (3.8)
I consider myself competent to participate in blogs.	2.63 ± 0.88	23 (9.7)	77 (32.6)	89 (37.7)	39 (16.5)	8 (3.4)
I know how to design, create and modify blogs (e.g., blogger, WordPress, etc.).	2.05 ± 0.97	77 (32.6)	75 (31.8)	47 (19.9)	20 (8.5)	17 (7.2)
I know how to use wikis (Wikipedia, Aulawiki21, etc.).	2.86 ± 0.93	23 (9.7)	48 (20.3)	95 (40.3)	62 (26.3)	8 (3.4)
I consider myself competent to design, create or modify a wiki (Wiki-space, Nirewiki, PBworks, etc.).	2.03 ± 0.97	80 (33.9)	72 (30.5)	46 (19.5)	20 (8.5)	18 (7.6)
I use Really Simple Syndication (RSS).	1.86 ± 1.07	82 (34.7)	23 (9.7)	29 (12.3)	16 (6.8)	86 (36.4)
I know how to use social bookmarking (del.icio.us, Blinkist, etc.).	1.92 ± 0.03	86 (36.4)	44 (18.6)	33 (14.0)	19 (8.1)	54 (22.9)
I am able to use educational platforms, (WebCt, online campus, intranet, Moodle, Dokeos, etc.).	2.90 ± 1.05	28 (11.9)	45 (19.1)	62 (26.3)	80 (33.9)	21 (8.9)

Note: M—mean, SD—standard deviation, f—frequency, %—percentage, DK/NO—do not know/no opinion.

With regard to the mean perception of competence expressed by the students in each of the variables studied, the results—in relation to gender—did not show statistically significant differences; similarly higher perceptions were recorded for both female students (6 out of 13 variables) and male students (7 out of 13 variables) (Table 3). In terms of the significant results, according to the type of university enrolled at, students from the public university showed higher scores than students from the private one, in relation to "I can communicate with other people by e-mail" (p = 0.039, r = 0.135), and "I am able to participate appropriately in forums" (p = 0.026, r = 0.148). However, students from the private university showed higher scores than those from the public one, concerning "I know how to use social bookmarking" (p= 0.002, r= 0.228).

Table 3. Descriptive statistics of perception of competences in knowledge and use of ICTs in social communication and collaborative learning, and differences between groups (gender and type).

Variables	M(SD)	Gender		U	r	*p*	Type		U	r	*p*
		Female	Male				Private	Public			
I can communicate with other people by e-mail.	3.45 ± 0.91	3.60 ± 0.76	3.40 ± 0.95	4731.00	0.089	0.171	3.34 ± 0.95	3.56 ± 0.85	6003.50	0.135	0.039 *
I use the chat to interact with other people.	3.44 ± 0.94	3.50 ± 0.83	3.42 ± 0.97	5200.00	0.009	0.894	3.43 ± 0.96	3.45 ± 0.92	6893.00	0.001	0.983
I use instant messaging as a tool to communicate with other people.	3.24 ± 1.05	3.33 ± 0.92	3.21 ± 1.09	4738.50	0.023	0.726	3.20 ± 1.05	3.29 ± 1.05	6056.00	0.050	0.452
I can communicate with other people by participating in social networks (Ning, Facebook, Twitter, Hi5, Myspace, Tuenti, etc.).	3.41 ± 0.85	3.47 ± 0.88	3.39 ± 0.85	4733.50	0.063	0.341	3.40 ± 0.88	3.43 ± 0.83	6717.50	0.001	0.982
I am able to manage professional networks (LinkedIn, Xing).	2.58 ± 0.95	2.52 ± 0.99	2.60 ± 0.94	4271.50	0.032	0.634	2.62 ± 0.96	2.54 ± 0.93	5677.50	0.048	0.479
I am able to participate appropriately in forums.	2.81 ± 0.90	2.79 ± 0.83	2.82 ± 0.93	4801.50	0.016	0.808	2.68 ± 0.91	2.96 ± 0.88	5392.50	0.148	0.026 *
I consider myself competent to participate in blogs.	2.63 ± 0.88	2.46 ± 0.89	2.69 ± 0.88	4170.00	0.114	0.085	2.65 ± 0.89	2.61 ± 0.88	6383.00	0.015	0.815
I know how to design, create and modify blogs (e.g., blogger, WordPress, etc.).	2.05 ± 0.97	2.04 ± 0.86	2.05 ± 1.00	4435.50	0.013	0.847	2.13 ± 0.97	1.96 ± 0.95	5425.00	0.086	0.202
I know how to use wikis (Wikipedia, Aulawiki21, etc.).	2.86 ± 0.93	2.97 ± 0.90	2.82 ± 0.94	4542.00	0.063	0.345	2.87 ± 0.90	2.85 ± 0.97	6396.50	0.013	0.843
I consider myself competent to design, create or modify a wiki (Wiki-space, Nirewiki, PBworks, etc.).	2.03 ± 0.97	1.91 ± 0.87	2.07 ± 1.00	4102.00	0.058	0.394	2.12 ± 0.93	1.93 ± 1.02	5180.00	0.116	0.088
I use the Really Simple Syndication (RSS).	1.86 ± 1.07	1.78 ± 0.98	1.88 ± 1.11	2030.00	0.024	0.771	1.97 ± 1.10	1.73 ± 1.04	2460.00	0.117	0.153
I know how to use social bookmarking (del.icio.us, Blinkist, etc.).	1.92 ± 0.03	1.83 ± 1.04	1.95 ± 1.03	2889.50	0.061	0.409	2.14 ± 1.06	1.68 ± 0.95	3115.00	0.228	0.002 **
I am able to use educational platforms, (WebCt, online campus, intranet, Moodle, Dokeos, etc.).	2.90 ± 1.05	3.02 ± 1.01	2.86 ± 1.06	3954.50	0.061	0.368	3.01 ± 1.03	2.80 ± 1.06	5108.00	0.105	0.124

Note: M—mean, SD—standard deviation, f—frequency, %—percentage, DK/NO—do not know/no opinion. Level of significance * $p < 0.05$ ** $p < 0.01$.

Dimension II: Competences in the use of ICT for information search and processing.

Table 4 shows the descriptive statistics of DII, which indicate that respondents mostly perceived themselves as fully proficient in using different browsers to surf the internet (77.5%; 3.60 ± 0.88), working with any documents on the web (59.3%; 3.35 ± 0.94), and using different search engines (57.2%; 3.35 ± 0.91). In contrast, they considered themselves completely ineffective, to a greater extent, in using QR codes to disseminate information (32.6%; 2.19 ± 1.08), variables related to the use of social software (any version), with respect to working with images (26.7%; 2.24 ± 1.06), analysing and/or browsing content on blogs (25.0%; 2.21 ± 1.00), and organising, analysing, and synthesising information by means of concept maps (23.3%; 2.32 ± 1.03).

Table 4. Descriptive statistics on the perception of competences in the use of ICTs for information search and processing (DII).

Variables	M(SD)	1. Completely Ineffective	2	3	4. Complete Mastery	DK/NO
		f (%)	f (%)	f (%)	f (%)	f (%)
I can surf the Internet with different browsers (Chrome, Mozilla, Opera, Explorer, etc.).	3.60 ± 0.88	18 (7.6)	8 (3.4)	24 (10.2)	183 (77.5)	3 (1.3)
I am able to use different search engines (Google, Ixquick, Mashpedia, etc.).	3.35 ± 0.91	15 (6.4)	24 (10.2)	59 (25.0)	135 (57.2)	3 (1.3)
I feel able to work with any digital mapping software to search for places (Google Maps, Google Earth, Vpike, Tagzania, etc.).	2.80 ± 1.06	36 (15.3)	49 (20.8)	71 (30.1)	75 (31.8)	5 (2.1)
I know how to use any programs to plan my study time (Google calendar, etc.).	2.78 ± 1.04	34 (14.4)	51 (21.6)	75 (31.8)	69 (29.2)	7 (3.0)
I work with any documents on the net (Google Drive, Skydrive, etc.).	3.35 ± 0.94	19 (8.1)	19 (8.1)	56 (23.7)	140 (59.3)	2 (0.8)
I am able to organise, analyse and synthesise information through concept maps using any social software tool (Cmaptool, Mindomo, Text2mindmap, Bubbl, etc.).	2.32 ± 1.03	55 (23.3)	69 (29.2)	55 (23.3)	34 (14.4)	23 (9.7)
I can use any software to disseminate interactive presentations online (Prezi, Slide Share, Scribd, etc.).	2.79 ± 1.03	32 (13.6)	50 (21.2)	79 (33.5)	66 (28.0)	9 (3.8)
I feel competent to work with any social software tools that help me to analyse and/or browse content included in blogs (Wordle, Tagxedo, etc.).	2.21 ± 1.00	59 (25.0)	69 (29.2)	49 (20.8)	26 (11.0)	33 (14.0)
I work with images using any social software tools and/or applications (Gloster, PicMonkey, Animoto, etc.).	2.24 ± 1.06	63 (26.7)	64 (27.1)	47 (19.9)	33 (14.0)	29 (12.3)
I feel able to use podcasting and videocasts (Flicks, Odeo, YouTube, etc.).	2.65 ± 1.02	33 (14.0)	75 (31.8)	61 (25.8)	61 (25.8)	6 (2.5)
I use QR codes to disseminate information.	2.19 ± 1.08	77 (32.6)	68 (28.8)	46 (19.5)	37 (15.7)	8 (3.4)

Note: M—mean, SD—standard deviation, f—frequency, %—percentage, DK/NO—do not know/no opinion.

The results, regarding the perception of competences in the use of ICTs for information search and processing among university students, showed statistically significant differences in perception, according to both the gender of the respondents and the type of university (Table 5). Regarding gender, female university students significantly felt more proficient in using programs for planning their study time (e.g., Google Calendar®) than male students (p = 0.007, r = 0.178); in addition, females perceived higher competence in most of the variables (10/11 variables) compared to males (1/11 variables). With regard to the type of institution, statistically significant differences were found with respect to "I use QR codes to disseminate information" (p = 0.002, r = 0.206), with students from the public university perceiving higher competence. The overall assessment of students' perceptions of the two types of universities was similar, with the private university scoring slightly higher in 6/11 variables and the public university scoring slightly higher in 5/11 variables.

Table 5. Descriptive statistics on the perception of competences in the use of ICTs for information search and processing, and differences between groups (gender and type).

Variables	M(SD)	Gender		U	r	*p*	Type		U	r	*p*
		Female	Male				Private	Public			
I can surf the Internet with different browsers (Chrome, Mozilla, Opera, Explorer, etc.).	3.60 ± 0.88	3.63 ± 0.87	3.59 ± 0.89	4960.50	0.035	0.591	3.56 ± 0.91	3.63 ± 0.85	6590.50	0.034	0.602
I am able to use different search engines (Google, Ixquick, Mashpedia, etc.).	3.35 ± 0.91	3.46 ± 0.92	3.31 ± 0.90	4536.50	0.098	0.133	3.30 ± 0.95	3.39 ± 0.86	6503.50	0.040	0.540
I feel able to work with any digital mapping software to search for places (Google Maps, Google Earth, Vpike, Tagzania, etc.).	2.80 ± 1.06	2.86 ± 1.05	2.78 ± 1.07	4807.00	0.033	0.620	2.74 ± 1.14	2.87 ± 0.98	6341.50	0.044	0.505
I know how to use any programs to plan my study time (Google Calendar, etc.).	2.78 ± 1.04	3.09 ± 1.00	2.68 ± 1.03	3832.00	0.178	0.007 **	2.73 ± 1.05	2.83 ± 1.03	6188.00	0.050	0.446
I work with any documents on the net (Google Drive, Skydrive, etc.).	3.35 ± 0.94	3.47 ± 0.86	3.31 ± 0.96	4706.50	0.076	0.248	3.25 ± 0.98	3.46 ± 0.88	6076.50	0.110	0.092
I am able to organise, analyse and synthesise information through concept maps using any social software tool (Cmaptool, Mindomo, Text2mindmap, Bubbl, etc.).	2.32 ± 1.03	2.54 ± 1.04	2.25 ± 1.02	3623.00	0.122	0.075	2.35 ± 1.00	2.29 ± 1.06	5439.50	0.034	0.617
I can use any software to disseminate interactive presentations online (Prezi, Slide Share, Scribd, etc.).	2.79 ± 1.03	2.93 ± 1.02	2.74 ± 1.01	4347.00	0.089	0.181	2.89 ± 0.98	2.69 ± 1.04	5789.50	0.091	0.170
I feel competent to work with any social software tools that help me to analyse and/or browse content included in blogs (Wordle, Tagxedo, etc.).	2.21 ± 1.00	2.18 ± 0.98	2.22 ± 1.01	3757.00	0.014	0.844	2.33 ± 1.02	2.07 ± 0.98	4427.00	0.126	0.073
I work with images using any social software tools and/or applications (Gloster, PicMonkey, Animoto, etc.).	2.24 ± 1.06	2.26 ± 1.05	2.24 ± 1.06	4072.50	0.011	0.872	2.36 ± 1.07	2.11 ± 1.03	4641.50	0.118	0.089
I feel able to use podcasting and videocasts (Flicks, Odeo, YouTube, etc.).	2.65 ± 1.02	2.74 ± 0.94	2.62 ± 1.05	4618.00	0.049	0.456	2.71 ± 1.01	2.59 ± 1.04	6120.00	0.066	0.318
I use QR codes to disseminate information.	2.19 ± 1.08	2.25 ± 1.04	2.17 ± 1.09	4634.00	0.038	0.563	2.40 ± 1.08	1.96 ± 1.06	5002.50	.206	0.002 **

Note: M—mean, SD—standard deviation. Level of significance, **, $p < 0.01$.

Dimension III: Virtual and social communication tools of the university.

Finally, the analysis of the results regarding the perception related to the university's virtual and social communication tools (Table 6) showed that students mostly felt fully proficient in using the virtual platform (71.6%; 3.51 ± 0.90) and university email (58.5%; 3.20 ± 1.09). On the contrary, they considered themselves completely ineffective in participating in social networks (42.8%; 2.00 ± 1.10) and consulting the university's newspaper (28.8%; 2.30 ± 1.09).

Table 6. Descriptive statistics on the perception of the virtual and social communication tools of the university (DIII).

Variables	M(SD)	1. Completely Ineffective	2	3	4. Complete Mastery	DK/NO
		f (%)	f (%)	f (%)	f (%)	f (%)
I use the university email	3.20 ± 1.09	30 (12.7)	31 (13.1)	37 (15.7)	138 (58.5)	0 (0.0)
I use the university's virtual platform	3.51 ± 0.90	16 (6.8)	17 (7.2)	33 (14.0)	169 (71.6)	1 (0.4)
I consult the university newspaper	2.30 ± 1.09	68 (28.8)	61 (25.8)	54 (22.9)	40 (16.9)	13 (5.5)
I participate in the university's social networks	2.00 ± 1.10	101 (42.8)	55 (23.3)	34 (14.4)	34 (14.4)	12 (5.1)

Note: M—mean, SD—standard deviation, f—frequency, %—percentage, DK/NO—do not know/no opinion.

In analysing the perceived competence regarding the use of virtual and social communication tools, according to the type of university and gender, statistically significant differences were found with respect to the type of institution (Table 7) regarding the variables "I use the University email" (p = 0.002, r = 0.200) and "I participate in the University's social networks" (p = 0.005, r = 0.189), with higher scores obtained by the students from the private university in both. In terms of gender, although no significant differences were found, there was a higher perception of competence in most of the variables in the case of females (3/4 variables) compared to males (1/4 variables).

Table 7. Descriptive statistics on the perception of the virtual and social communication tools of the university, and differences between groups (gender and tenure).

Variables	M(SD)	Gender		U	r	p	Type		U	r	p
		Female	Male				Private	Public			
I use the University email	3.20 ± 1.09	3.35 ± 1.05	3.15 ± 1.10	4711.50	0.091	0.162	3.38 ± 1.05	3.01 ± 1.11	5526.50	0.200	0.002 *
I use the University's virtual platform	3.51 ± 0.90	3.63 ± 0.82	3.47 ± 0.92	4706.50	0.099	0.130	3.48 ± 0.88	3.54 ± 0.92	6383.00	0.082	0.208
I consult the University newspaper	2.30 ± 1.09	2.28 ± 1.18	2.30 ± 1.06	4667.50	0.019	0.773	2.38 ± 1.02	2.21 ± 1.15	5618.50	0.086	0.199
I participate in the University's social networks	2.00 ± 1.10	2.05 ± 1.08	1.99 ± 1.11	4611.50	0.034	0.613	2.19 ± 1.11	1.81 ± 1.07	4978.00	0.189	0.005 *

Note: M—mean, SD—standard deviation. Level of significance * $p < 0.05$

4. Discussion

The present study aimed to discover students' perceptions regarding the acquisition and proficiency in DCs. For this purpose, 236 students from the Catholic University of Murcia and the Pablo de Olavide University of Seville were evaluated in order to implement improvements in the teaching–learning process within the EHEA. In these changing times, in which new technologies are being increasingly used, there is a clear need for citizens to be trained in CD and for students to be able to use ICT in different areas, whether

academic, personal or professional, in order to strengthen lifelong, autonomous, and critical learning [43].

The students indicated that 94.50% of them had not received training on Web 2.0 or any social software. With respect to the students in this study who had received training (5.50% of the students), this result differed substantially from the work by Conde et al. [34] (with a recorded value of 84.30%), and the research by Burgos-Videla et al. (with a value of 57%) [41]. This situation is worrying, as the European Commission [43] indicates that the management and use of ICT should be performed from an early age.

Regarding the frequency of the use (hours) of the internet, the most outstanding value was that more than 30.90% of students were "continuously surfing", followed by 27.10% using the internet more than 9 h a week, coinciding with findings from Conde at al. [34], and 22.50% used the internet more than 20 h a week. However, Vergara [44] found that, among students with an average age of 30.5, the majority used the internet between 1 and 3 h (80%), and only 17% used it for more than 9 h, with the youngest students (18–19 years old) being in this range.

The discussion is organized according to the different dimensions of the COBADI questionnaire:

Dimension I: Competences in knowledge and use of ICTs in social communication and collaborative learning.

Regarding this dimension, the variable with the highest mean score obtained in this study was "I can communicate with other people by e-mail" (3.45), with a higher score found in females. In terms of the type of university, significant differences were found ($p = 0.039$, r = 0.135) concerning students from the public university as they were the ones who had best acquired this competence. In this study, this competence was fully acquired by 66.50% of students, as suggested by other studies [34,45–47]. In contrast, a study conducted on students in Panama indicated that 36.8% of students who were analysed had fully mastered this competence [44].

Another variable with a more relevant rating was 'I use the chat to interact with other people', where both genders obtained an average rating of 3.44; this result is in line with results from prior studies [46,48,49]. Regarding this variable, the study by García-Martín and García-Sánchez [50] should be highlighted, where they stated that students with a higher education, with a higher socioeconomic level, used these resources the most. Students also rated the ability to communicate with other people by participating in social networks highly (3.41), both for males (3.39) and females (3.47), in line with the results found in research by Veytia-Bucheli [49] and Vegara [44].

During the COVID-19 lockdown, the perceptions of undergraduate sports science students (regarding their social media (SM) and PA patterns during the first Spanish COVID-19 lockdown period (March to May 2020)) were explored. They perceived SM platforms as channels through which they could communicate, with females showing higher scores than males, and with YouTube and Instagram being the most utilized SM platforms for viewing or practicing PA. Thus, it is important to analyse the digital competences of students, as the use of SM has practical implications for creating opportunities to connect people and offer innovative proposals [51].

In contrast, one of the lowest results presented by the students in this study was found in the variable related to the use of wikis (2.86), where 26.30% had fully acquired this competence. These results are in line and completely coincide with the research by Veytia-Bucheli [49] and Vergara [44], which also showed that 26.30% of university students had acquired this competence. Continuing with the student weaknesses, with regard to the DCs, it should be noted that they did not consider themselves competent (8.1%) in appropriately participating in forums, with a score of 2.81, with significant differences in terms of the type of institution ($p = 0.026$, r = 0.148), with a higher perception of students from the public university (3.03) compared to the private entity. In general terms, the study by Vergara [44] indicated that 21% of students who were analysed fully mastered this competence, as the data were similar to those obtained in this study (23.70%).

As for the ability and competence to generate content in the design and creation of wikis and blogs, in addition to these being two variables that show the same mean rating (2.05) in the perception of this DC, university students did not show significant differences with respect to gender or the type of university. Regarding the proficiency in this competence, a result of only 8.50% is shown, which coincides with results presented by Vergara [44] and Vázquez et al. [46], indicating that the competence in generating content had not been acquired. On the other hand, in the study by Veytia-Bucheli [49], the authors considered that one of the strengths of the study was the use of educational platforms, while in the present study, this was not a strength, as students rated it at 2.90, and 11.90% indicated that they were completely ineffective in this use.

Dimension II: Competences in the use of ICT for information search and processing.

Regarding the perception of competences in the use of ICTs for searching and processing information during COVID-19, the students surveyed considered themselves generally competent in this dimension; these results coincide with those presented by Hervás-Gómez et al. [52]; they conducted a study on the perception of digital competences during the pandemic, finding no difficulties in adapting to the online or hybrid modality. However, in previous years, females were perceived as better than males in their ability to use electronic tools for online communication. [53].

Focusing on the variable "I can surf the Internet with different browsers", they perceived themselves as very competent (77.50%); in terms of gender distinctions, females did so slightly more (3.63) than males (3.59), with the overall mean of the variable being 3.60. Without distinguishing by gender, the results of this study are in line with previous research [34,47,54].

However, significant differences were found ($p = 0.007$, r = 0.178) between students, with respect to the variable "I know how to use any programs to plan my study time" (Google Calendar. . .), where the mean of the results was 2.78, where females (3.09) showed a better valuation than males (2.68). These results are similar to those by García-Martín and García-Sánchez [50], where they stated that they obtained significant differences in terms of gender with regard to educational tools, with a higher result in females.

Another variable, where 59.30% of students felt completely competent, and there were good evaluations in both males (3.31) and females (3.47), was the competence related to "I work with any documents on the net" (Google Drive, Skydrive. . .); these data are in line with the study carried out by López-Meneses [54], where the results were slightly lower than those of this study, with a score of 3.22.

One of the lowest rated competences was that of "I am able to organise, analyse and synthesise information by means of concept maps using any social software tool". In reference to gender, males (2.78) considered themselves less competent than females (3.86), which was the same in both universities, although in the public university (2.29), the assessment was slightly lower than in the private one (2.35), with these data coinciding with the studies carried out by Roig-Vila et al. [48] and Veytia-Bucheli [47].

Regarding the use of different search engines to find information, students considered this competence to be a strength, and felt fully competent in 57.20% of cases, with females (3.46) considering themselves more competent than males (3.31), although these findings were contrary to the research by Zhao et al. [10], where males perceived their level of digital competence in the area of information and data literacy to be significantly higher than that of females. The mean for the variable was 3.35, a lower result obtained in this study than that recorded by López-Meneses et al. [54], who obtained an average evaluation of 4.62. As for the difference in the type of university, students at the public university (3.39) had a better grasp of this competence than students at the private university (3.30). These data are in line with previous research by Veytia-Bucheli [47,49].

One of the main weaknesses found by university students was that of "I use QR codes to disseminate information", where 32.60% felt completely ineffective, without differences observed between genders (male–female), although it was slightly more positive for females (2.25) than for males (2.17); the work by López-Meneses et al. [54] showed a lower score

(1.95). However, significant differences (p = 0.002, r = 0.206) were found in the assessment in terms of the type of university, where it was less highly valued in the public university (1.96) than in the private university (2.40), with similar results found in the study by Veytia-Bucheli [47].

Different studies have indicated that, given its use, it is a limited resource, although in higher education, they recognised that it is an important tool for promoting learning in the classroom [55,56], promoting greater student participation in teaching–learning activities, as well as being a good predictor of competence development [57].

Dimension III: Virtual and social communication tools of the university.

With regard to the variable "I use the University email", 58.50% of students felt competent in its use, and no significant differences were found according to gender, although the value was slightly higher for females (3.35) compared to males (3.15), with the study by Roig-Vila et al. [48] indicating that this use was between 20 and 25% of respondents. However, there were statistically significant differences in terms of the type of university (p = 0.002, r = 0.200), with it being more highly rated in the private university (3.38) compared to the public one (3.01).

The assessment of the use of another tool provided by the university, such as the variable "I use the University's virtual platform", showed a mean overall evaluation of 3.51. It should be noted that the evaluation was similar for the type of university (private 3.48 and public 3.54); in regard to gender, the evaluation of the female gender (3.63) was once again higher than the male one (3.47), where, in general, the students in this study felt that they had full control, with a percentage of 71.6%. These values were higher than in previous research, such as the study by Roig-Vila et al. [48], who reported that 60.6% felt fully competent to make use of it, or in research by Veytia-Bucheli [49], where the students affirmed that it was a competence that they had very much acquired. In contrast, students did not participate in the university's social networks, with a statistically significant difference in terms of the type of university (p = 0.005, r = 0.189), with students from the private university (2.19) participating more than those from the public university (1.81). These students reported that they had enough and/or full proficiency in the competences needed for participation (52.10%), higher than the 42% reported in the study by Roig-Vila et al. [48].

Finally, it should be noted that the development of DCs is crucial for the university student to be able to perform adequately, personally and academically, as well as to deepen the educational and professional use of digital tools. For the use of ICT and learning to be more meaningful, and following research by Deschryver and Spiro [58], it is necessary for students to gather, organise, analyse, and create their own knowledge.

5. Conclusions

The present study, focusing on the digital competences (DC) of undergraduate students pursuing physical activity and sports science, is undoubtedly relevant for this sector, as it provides information that should be considered to better train future graduates in DC development. It is of vital importance to know the initial DCs of the students, so that the teaching staff can use the appropriate strategies for implementing the correct technology in the classroom, according to the digital knowledge of the students. Nevertheless, it should be considered that the "Basic Digital Competences 2.0" is a dated concept, and in order to enhance future research studies, it is necessary to revise the questionnaire to adapt it to the Digital Competences Framework (DigComp 2.2) in the IoT (Internet of Things) era, as indicated by the recommendations from the European Commission [15].

In this sense, the results yield important and necessary information in terms of the three dimensions analysed. Regarding the first dimension of competences in knowledge and use of ICT in social communication and collaborative learning, it should be noted that there were no significant differences with respect to gender, although significant differences were found with respect to the type of institution, where the variable with the highest score was "I can communicate with other people by e-mail" (3.45), while the variable with the lowest score was "I use Really Simple Syndication (RSS)" with a value of 1.92.

Concerning the second dimension, regarding the competences of ICT use for searching for and processing information, two variables showed significant differences in terms of the type of institution and gender; the variable "I use QR codes to disseminate information" obtained a significant difference according to the type of university, with a better value for a private one. In terms of gender, the variable "I know how to use programs to plan my study time" (Google Calendar. . .) registered a better value for females (3.46) than for males (3.31). The variable with the best score was "I can surf the Internet with different browsers" (Chrome, Mozilla, Opera, Explorer, etc.) (3.60), and the variable with the lowest score was "I use QR codes to disseminate information", with a value of 2.19.

As for the variables from the third dimension, regarding the use of virtual tools and social communications at the university, significant differences were again found in terms of the type of university, with private university students having higher scores in the use of email and social networks compared to public university students; although the female gender stood out in this use, it was not significantly so.

Furthermore, it is very relevant to provide other academic uses to social media (SM), i.e., as part of the content of the university subjects taught in class, the use of LinkedIn for the professional development of graduates in sports sciences [59], and the pedagogical use of TED Talks [60] or TikTok [61], which promote student motivation, create engaging learning environments, and encourage the development of skills, such as creativity and curiosity.

However, this study has limitations and offers future perspectives that need to be addressed; it is necessary to extend the sample to more universities of different types that offer degrees in physical activity and sports science, in order to obtain a greater representation of students. As future lines of research, it would be interesting to replicate the study for the CAFyD degree or as determined in other countries.

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