Perspectives on the information and digital competence of Social Sciences students and faculty before and during lockdown due to Covid-19

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Abstract

We analyze the perceptions of Social Sciences faculty about their own information and digital competence and that of their students, as well as the changes that have occurred as a consequence of the virtualization of learning caused by the coronavirus pandemic (Covid-19). The methodology used is qualitative, being based on the application of two techniques: discussion groups carried out with experienced faculty from three Spanish universities, and interviews carried out with the same sample after the suspension of face-to-face teaching. The results show that the faculty members participating in this study have a critical vision of the information and digital competence of the student body, indicating that they lack capacity for evaluation, critical use, and communication of information despite their mastery of technological tools and extensive use of mobile devices. In addition, they doubt their own ability to train students in this competence, and attribute the difficulty in achieving and promoting such learning to various factors of the university culture: a lack of coordination among teaching staff, who are sometimes in situations of job insecurity, or the way in which the European Higher Education Area has been applied in universities. Faculty recognize the basic and transversal nature of this competence and advocate its incorporation into the real work methodology of all subjects, not in a segregated way. Finally, the effort made towards the "virtual" development of teaching as a consequence of the Covid-19 pandemic has been a shock for faculty, who declare a positive attitude towards reviewing their own digital-informative practices to adapt their teaching, but believe that this has hardly resulted in any improvement in the information and digital competence of their students so far.

Keywords

1. Introduction

In this globalized, hyperconnected, and post-truth world, information and digital competence (IDC) is key at all educational levels and plays an increasingly relevant role in our daily lives. Every person as a citizen, whether a university student or not, must strengthen their critical spirit to learn how to manage and contrast the enormous amount of information that surrounds us in a responsible way, distinguish opinions from facts, learn to consume and produce information in collaborative environments, always considering ethics, and understand that all of this is part of a necessarily permanent learning process that develops throughout one's life (**Cortés-Vera**, 2019; **Goldstein**, 2020).

University education is one of the fundamental areas in which this competence must be acquired, since it prepares those who must transmit, apply, and create new knowledge critically as professionals and/or scientists. We thus propose herein to understand how faculty –specifically those who teach Social Sciences degrees– perceive this ability, and the extent to which they consider that they and their students have mastered it in the context of mobile technologies and devices that, through their ubiquity, have further increased the transformation of communication and access to information.

The present research started by carrying out discussion groups with Social Sciences faculty from three Spanish universities: the *Complutense University of Madrid* (*UCM*), the *Jaume I University* of Castellón (*UJI*), and the *University of Murcia* (*UMU*), which teach all or most of the following degrees: Audiovisual Communication, Information and Documentation, Business Management and Administration, Economics, Education, Primary School Teaching, Journalism, Pedagogy, and Tourism.

Having already collated the results, the outbreak of the global pandemic due to the coronavirus disease (Covid-19) at the beginning of March 2020 motivated us to propose a second consultation of the same participants. In this case, an interview was conducted by email to identify the changes in the IDC of faculty and students. Covid-19 has radically changed the fundamental conditions in the fields of health, the economy, social relations, communication, as well as of course in the workplace and teaching. We have had to adopt an urgent virtualization process and intensify the use of virtual campus tools for teaching, tutoring, and evaluation, which has resulted in a critical shift that has, with high probability, been able to transform the very concepts of IDC teaching and its students. We thus believe that there is a methodological imperative to delve into this critical event, as a way to begin to understand the present and foreseeable changes in Higher Education, which will tend to rely increasingly on e-learning.

Although the scientific literature on IDC at university is vast and it has been more than 30 years since the *American Library Association* (*ALA*) made its first proposals through the *Association of College and Research Libraries* (*ACRL/ALA*, 1989), the satisfactory incorporation and evaluation of this competence into Higher Education remains a distant goal, because it implies substantial changes in the culture, teaching methodology, and organization of universities as a whole (**Gómez-Hernández**, 2010). Many of these aspects are related not only to the educational services of university libraries and the models and norms regarding their content or assessment tools, but also the characteristics, attitudes, and values of the faculty and students (**Pinto**; **Sales**, 2015; **Sales**; **Pinto**, 2017), and the support of the university organization as a whole (**Webber**; **Johnston**, 2006), in a highly complex social and digital context.

Faculty, as mediators and facilitators of learning, are one of the key elements in the acquisition of IDC, making it relevant to ask essential questions about their pedagogical conceptions and related teaching practice. These questions guide our objectives, among which one can mention the following: What does faculty understand by IDC? Do they consider that students have adequate IDC upon entering their degree, or do they acquire it during their studies? Are there differences in the vision of faculty according to their area of knowledge or teaching experience? Do they think that they have sufficient IDC, or do they see deficiencies and shortfalls in their own capacity? What differences do they perceive in students' competence, and how do they value their digital ability? Which agents do they consider relevant to this ability? Are they cooperating satisfactorily? What main problems and proposals have they identified to integrate IDC, in both the methodological and organizational spheres, at both the individual and organization level? What significant differences and possibilities do they find between

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face-to-face teaching and that carried out on virtual campuses? How do they rate the use of mobile devices in their teaching? Are they ready to incorporate these devices? What challenges do they identify relating to the improvement of IDC, the reduction of distances among students, and the prevention of risks derived from insufficiency in this regard?

> ❛ IDC is not just another competence, but a complex reality that involves the entire university organization, learning and teaching approaches, and citizen training, both professional and scientific ❜

These questions open up the IDC problem, since answering them involves its analysis not as just another competence, but rather as a complex reality that involves the entire university organization, learning and teaching approaches, and citizen training, both professional and scientific. Its complexity explains the difficulties in incorporating it into university culture, and understanding it better will help to internalize it in faculty and students, which is the goal of the present research.

2. The permanent challenge of information and digital competence in university education

2.1. Conceptual evolution of information and digital competence (IDC)

Interest in this competence spread internationally in the field of Basic Education, especially with the *Big six skills* model (**Eisenberg**; **Berkowitz**, 1990) that proposed learning as problem solving, and in Higher Education through its promotion by the *ACRL/ALA* (1989). The latter defined what it initially called "information literacy" as a

> "survival skill in the information age,"

and years later published the *Information literacy competency standards for higher education* (*ACRL/ALA*, 2000), which were adopted by university libraries around the world as a frame of reference for their user training plans.

In addition to its wide deployment in formal education, the recognition of IDC extended to cover the full range of areas of social and professional life, as a skill for the general public. The *Unesco* proposal (**Wilson** *et al.*, 2011) understood as "media and information literacy" (MIL) contributed to this, and in Europe especially it resulted from the formulation of the key competences for lifelong learning proposed by the *European Commission* (2007), which gave rise to the *DigComp Framework* for digital competence (**Ferrari**; **Punie**; **Brečko**, 2013).

Despite the wide diversity of IDC approaches, we want to highlight, on the one hand, its double dimension as an academic and citizen skill, and on the other hand, its not merely instrumental but above all critical character, which is linked to the evaluation of truth, relevance, the purpose

> ❛ *ACRL/ALA* defined informational and digital competence (IDC) as a skill for survival in the information age ❜

and ethical use of information, and communication in different areas of life. Notwithstanding the great importance of technology and associated devices regarding the use of information and communication, or that the expression "digital literacy" is the most well established, there is a consensus that one of its key components is critical thinking, as well as its social and citizen aspects. It is a necessary skill for personal empowerment, being related to equal access to and use of information for everyday life, learning, and participation, as summarized in the update provided by *Cilip* (2018), emphasizing the informational dimension:

- It is the ability to think critically and express reasoned opinions about any information we find and use.
- It empowers us to reach and express informed points of view and involve ourselves fully in society.
- It encompasses skills and abilities that we need to perform tasks related to information, such as its discovery, access, interpretation, analysis, management, creation, communication, storage, and sharing.
- It also refers to the application of the skills, qualities, and confidence necessary to use information in the best way and interpret it judiciously.
- It includes critical thinking and critical awareness, as well as an understanding of the ethical and political aspects of information use.
- Information literacy relates to and overlaps with other literacies, specifically including digital literacy, academic literacy, and media literacy.
- It is not an independent concept, but rather is allied with other areas of knowledge and understanding.

Regarding Higher Education, fifteen years after the initial *Information literacy competency standards...*, the new *Framework for information literacy for higher education* published by the *ACRL/ALA* (2015) proposes a rethink of the IDC approach based on interconnected concepts, rather than through prescriptive lists of indicators and concrete abilities. This involves reconsidering the skill to support the three agents that are key for its achievement: the student body, with its growing role in the process of creating new knowledge; the faculty, as the driver of curricular design and projects involving IDC in each discipline; and library staff, who must facilitate learning and the design of curricula aligned with this skill, and collaborate closely with faculty.

A few years before, **Webber** and **Johnston** (2006) had established the set of characteristic features of what should be understood as an "information literate" university and information literate students, proposing first of all that IDC

should be integrated into curricula and form part of the comprehensive strategy of the university. Furthermore, they argued that IDC could not develop fully without support from the environment in which it is studied and operates.

> We want to highlight the IDC double dimension as an academic and citizen skill, and its not merely instrumental but above all critical character

We therefore see that this is a matter of integrating the different dimensions of IDC into what is already called *metaliteracy*, since

> "this redefinition of information literacy expands the scope of generally understood information competencies and places a particular emphasis on producing and sharing information in participatory digital environments" (**Mackey**; **Jacobson**, 2011, p. 63).

This is a vision of IDC that considers the complexity of the digital society, with an enormous amount of multimedia and hypermedia materials, multiple channels, and media that are part of broader models of visual and audiovisual significance, and an objective that goes beyond the acquisition of a set of skills, since it

> "ascends towards high-level intellectual and metacognitive behaviors and approaches" (**Secker**; **Coonan**, 2011, p. 20).

In addition, there is a set of "digital risks" that also affect students as citizens, and that must be incorporated into the concept of what we understand by IDC. These are disinformation and fake news, problems derived from the massive transfer of private data, or the capture of attention by mobile applications and social networks, whose distractive and addictive nature can lead to poor time management and difficulties in interpreting complex information. In particular, the extent and severity of the harmful effect of fake news have resulted in the concept of an "infodemic," understood as a global evil with political and social effects that has become more evident due to its damaging effects on actions against the Covid-19 pandemic, as stated by the *World Health Organization* (**Ghebreyesus**; **Ng**, 2020).

2.2. Information and digital competence (IDC) from the perspective of faculty

Universities are in a process of digital transformation or "digitalization" of their teaching, research, and transfer missions, which implies guaranteeing the IDC of the entire university community. However, although these needs have been recognized for years, in many cases they have not been addressed through comprehensive institutional plans, but rather via insufficiently coordinated measures and efforts in training faculty, updating curricula, and service initiatives provided by the Library or the computer services department. Moreover, consensus on and integration into teaching of another key aspect, i.e., how to assess the IDC achievements of students, have not been achieved despite many efforts and theoretical proposals, including the development of models, prototypes, and materials such as *IL-Humass* (**Pinto**, 2010), *InfoliTrans* (**Pinto** *et al.*, 2010), *Evalci* (**Pinto** *et al.*, 2013), or *Evalfin* (**Mears-Delgado**; **Marzal**, 2018) in our field.

Regarding the IDC of students, faculty represent a key binder in the actions for its promotion. Depending on their conceptions and teaching practices, faculty may or may not activate the students' process of learning this competence and enhance the efforts of library staff. And for this reason, investigation of their perceptions, the difficulties they observe, and the organizational improvements that they demand so that their efforts can boost the critical information capacity of their students becomes important.

Among recent research that have proposed to characterize IDC concepts also based on a qualitative methodology, we would first cite the work of **Tyron**, **Frigo**, and **O'Kelly** (2010), who collated the opinions of a group of 14 faculty about a training program run by the university library. That research used the focus group technique to obtain data from two samples of faculty from different subject areas, aiming to adapt and personalize the bases of the mentioned program in the most appropriate way for the institution's curricula, although the initial implementation of the program already considered the context and, for example, avoided the use of highly specialized metalanguage from the library and documentation field.

More recently, **Dawes** (2019) focused on measuring the perceptions of faculty about teaching the threshold concepts of the above-mentioned *Framework for information literacy for higher education*. Their qualitative analysis (based on a corpus comprising 24 semistructured interviews with a group of faculty from different disciplines) revealed two noteworthy results: that faculty already *de facto* teach some of the *threshold concepts* of the *Framework*, in particular "scholarship as conversation," "research as inquiry," and "authority is constructed and contextual," although they may not explicitly know this model, and that IDC exhibits a distinct transdisciplinary nature. The author concludes that faculty are aware of the importance of IDC for their students, but that truly effective training proposals must be designed and applied, for which cooperation and constant dialog with library support staff are necessary.

Likewise, **Stebbing** *et al.* (2019) conducted semistructured interviews with 22 Nursing and Business Administration faculty to characterize their perception of IDC, its impact in each discipline, and their vision of the student needs. They identified six key areas of concern for faculty in this regard: student needs in their transition to Higher Education, how to develop assessment skills, the importance of final degree work (FDW), differences between disciplines, the complex informational landscape, and the need to prepare students for their professional careers by training them in IDC.

2.3. Incorporation of IDC into Spanish universities

In Spain, IDC learning has been approached from two levels that have not always been well coordinated: faculty and librarians, i.e., actions via teaching staff and curricula, on the one hand, and another via university libraries, occasionally supported by computer services, on the other.

In the teaching field, with the adaptation of university degrees to the European Higher Education Area, "management and use of information" has been incorporated as a transversal competence in all careers since 2000 by being included in the *White papers* on which they are based. This encouraged various solutions, from specific subjects in some universities (the *University of Seville*, the *Carlos III University of Madrid*, or the *University of Zaragoza*), to specific or free-choice courses and strategies for practical collaboration with libraries (**Gomes-Almeida**; **Hernández-Pérez**, 2013). Moreover, it can be considered that IDC content is present in various courses on the introduction to research methodology, and the compulsory FDW can be considered to be the definitive tool for students to complete their degree qualification.

A unique situation is presented by those degrees whose curricula, due to their link with information management and communication or teacher training, include their own IDC content. That means, on the one hand, teaching degrees, and on the other degrees in Information and Documentation, Audiovisual Communication, Journalism, Advertising and Public Relations, Translation and Interpretation, or Public-Sector Management and Administration. In Teaching degrees, concern has focused on the so-called "digital teaching competence," for which projects and programs have been developed with satisfactory results, especially based on the *DigComp* Framework (**González-Calatayud**; **Román-García**; **Prendes-Espinosa**, 2018), which is the most highly valued in the area of educational technology (**Cabero-Almenara** *et al.*, 2020). Among the degrees that are closely related to libraries and content management, the existence of subjects to prepare future professionals who will offer services including teaching access to and use of information is well documented (**Gómez-Hernández**, 2009). And finally, there are also specific courses or sections in the curricula of Medicine and Nursing degrees (**Manso-Perea**; **Cuevas-Cerveró**; **González-Cervantes**, 2019).

In the library field, staff have been adapting user training to IDC teaching, with support from and coordination by the *University Library Network* (*Rebiun*), which is part of the *Spanish Conference of Rectors* (*CRUE*). *Rebiun* has always included in its plans a strategy regarding its role in learning and IDC and has developed projects in almost all universities (*CRUE. Joint commission TIC-Rebiun*, 2012b), but has had difficulties in adopting a stable and generalizable framework for content. In principle, it tried to collaborate with computer services to develop a very basic model known as Computer and Information Competence (CI2) (*CRUE. Joint Commission TIC-Rebiun*, 2012a). Thereafter, with the arrival of DigComp, an attempt was made to synthesize both of these, giving rise to another model called the Definition of Information Competences for Undergraduate Students (*Rebiun*, 2014). And more recently, it elaborated a full adaptation to the European Framework (*Rebiun*, 2016) by offering a MOOC to train the student body, which has left an open-access repository of audiovisual learning materials.

However, despite good examples and practices in both the teaching and library sectors, we believe that the scope of these actions has been reduced due to the following factors:

- The adaptation to new learning methodologies has been carried out with large groups of students and insufficient pedagogical preparation and faculty coordination. The economic crisis created precarious working conditions, and in this context methodologies that sufficiently involve IDC and its activation among the student body have not been applied. Even in the FDW, deficiencies are seen in terms of students' abilities to search for, use, and communicate information, and this is leading to the incorporation of short courses to prepare such skills, or *ad hoc* workshops organized by each degree according to the needs of its students.
- Regarding the action of libraries, the fact that their courses and learning materials are not integrated into the curricular content means that they only reach a group of highly motivated students, and that learning may be decontextualized from course content, reducing its effectiveness.

3. Objectives and methodology

3.1 Objectives

In a context in which face-to-face and virtual teaching are being combined, and mobile technologies and devices have made access to information ubiquitous, the objective of this research is to determine how Social Sciences faculty perceive IDC, and whether they consider that they and their students have mastered it, to identify the problems that condition it, and proposals for better learning. The critical event of the Covid-19 pandemic has also been included, because it has forced an accelerated conversion to the virtual mode of teaching and has been able to reveal the levels of mastery of this competence by students and faculty. The specific objectives were:

1) To identify the concept of IDC held by Social Sciences faculty and describe their assessment of the IDC level of their students, as well as their own mastery and ability to teach it.

2) To identify organizational and methodological problems that they consider relevant to the acquisition of IDC by students, as well as the university agents involved, according to the faculty, and how they should cooperate and act together.

3) To obtain their proposals for organizational and didactic improvement of IDC teaching.

4) To determine how faculty evaluate the use of mobile devices in the classroom by themselves and by students.

5) To identify faculty's attitudes towards the virtualization of teaching and its assessment of IDC in the e-learning processes adopted in the face of the Covid-19 pandemic.

3.2 Methodology

To carry out this research, it was decided to apply a qualitative methodology, since this allows one to delve into questions related to conceptions, perceptions, and evaluations. The techniques used were the discussion group and the interview. Content analysis, reflection, comparison, and criticism were applied to the responses obtained, to formulate the results and conclusions related to the analyzed sample.

The discussion group was carried out with faculty teaching the degrees under investigation, using a semistructured script organized into three blocks which flexibly integrate the first four objectives of this study. The dialogue was enabled in each university by a member of the research team, who was responsible for facilitating the interventions of the participating faculty to talk around the objectives, directing the discussion according to the thematic areas in which they were grouped in the script.

- The first block focused on *the information and digital competence of students: the use and value of information*, with the intention of determining the perspective of faculty on whether their students know how to use information, whether being supposedly a digital native indeed implies such knowledge, the level of IDC with which they arrive at university, the context in which they use information, and whether they know how to do this from a critical perspective.
- The second block proposed a reflection on the *agents responsible for information competence at the university*, to determine whether the faculty considered that acquisition of IDC is the responsibility of the university and if it facilitates it, as well as what could be done to improve this, together with the role of university libraries.

Table 1. Composition of the discussion groups

UCM discussion group, duration 1 hour 44 minutes				
Participant	**Degree(s) which (s)he teaches**	**Gender**	**Profile***	**Years of experience**
UCMP1	Degree in Primary Education Degree in Pedagogy	M	PA	20
UCMP2	Degree in Advertising Degree in Journalism	M	TU	22
UCMP3	Degree in Journalism	F	PA	10
UCMP4	Degree in Audiovisual Communication	F	PCD	26
UCMP5	Degree in Information and Documentation	F	PCD	18
UCMP6	Degree in Pedagogy	F	PA	19
UJI discussion group, duration 1 hour 34 minutes				
Participant	**Degree(s) which (s)he teaches**	**Gender**	**Profile**	**Years of experience**
UJIP1	Degree in Education	F	PAD	13
UJIP2	Degree in Audiovisual Communication	F	CU	28
UJIP3	Degree in Advertising and Public Relations Degree in Audiovisual Communication	F	CU	23
UJIP4	Degree in Tourism	M	PCD	14
UJIP5	Degree in Journalism	F	PCD	29
UJIP6	Degree in Business Administration	F	TU	29
UMU discussion group, duration 1 hour 50 minutes				
Participant	**Degree(s) which (s)he teaches**	**Gender**	**Profile**	**Years of experience**
UMUP1	Degree in Audiovisual Communication	F	TU	15
UMUP2	Degree in Economics	M	TU	20
UMUP3	Degree in Business Administration	F	TU	30
UMUP4	Degree in Advertising	M	PCD	15
UMUP5	Degree in Documentation	F	TU	27
UMUP6	Degree in Journalism	F	TU	10
UMUP7	Degree in Primary Education	M	TU	18
UMUP8	Degree in Pedagogy	M	PCD	10

*Profiles from the Spanish university system:
PA: Profesor asociado, PAD: Profesor ayudante doctor, PCD: Profesor contratado doctor, TU: Titular de universidad, CU: Catedrático de universidad

- Finally, the third block addressed the *self-conception of information competence as a teacher*, delving into the perception of their own IDC, the transfer of that competence, that is, whether they consider that they know how to transmit or teach it to their students, and the role of mobile devices in teaching, especially in relation to teaching IDC.

During the 2019-20 academic year, discussion sessions were held at three universities (*UJI*, *UCM*, and *UMU*), moderated by a member of the research team, who recruited participants, constituting an intentional nonrandom sample according to the purposes of this work. The criteria applied regarding the representativeness of the sample were that the faculty carried out their teaching activity in the Social Sciences undergraduate degrees that are the objective of this research, ensuring heterogeneity and diversity in terms of teaching experience (between 10 and 30 years in their teaching center), professional status, and a certain gender balance (Table 1).

To enable the group discussions, efforts were made to create a relaxed atmosphere that would facilitate the expression of opinions, and authorization was obtained for audio recording of the sessions for subsequent anonymous transcription.

The interview was the second qualitative technique applied, used to address objective 5 of this study. Having carried out the transcription and analysis of the working groups between the last quarter of 2019 and February 2020, in March of that year we were writing the results when the SARS-CoV-2 virus started to spread. Its consequence, the Covid-19 disease, turned into a pandemic, forcing social lockdown and the suspension of classroom teaching. Given the immediate and forced virtualization of all university activities, we decided to investigate the impact of this on teaching and learning practice, and its specific impact on students' and faculty's vision of IDC. For this reason, we designed an interview based on six specific questions that we administered by email during the first week of April to the participants of the discussion groups at the three universities:

1) Do you think that the information competence of your students has increased?

2) Has this process been satisfactory for you as a teacher; have you had difficulties related to didactic or technological aspects?

3) Do you observe changes in the way in which your students access, analyze, and communicate information in this context?

4) Have the students got involved as you expected?

5) Do you think they are interacting and working well with mobile devices or computers?

6) What is your assessment of what this adaptation of your teaching to the virtual context has meant?

Content analysis was carried out on the transcripts of the discussion groups and the compiled responses to the interviews. Two groups of tables were prepared to categorize the *verbatim* quotes, referring to the different topics covered and the specific objectives.

On the one hand, the first group of tables described the vision of faculty on the information and digital competence in the participating universities before Covid-19 (data collected through the discussion groups). And, on the other hand, the second group referred to the vision during the first weeks of teaching activity conditioned by Covid-19 (data obtained through interviews).

The first group of tables included the *verbatim* quotes, structured into broad categories for analysis, namely

- the faculty's vision of the IDC of the student body,
- the IDC responsibilities of the university,
- the faculty's self-concept of their IDC, and
- their assessment of the integration of mobile devices into Higher Education.

These categories, in turn, were each divided into different units of meaning or dimensions of analysis that would be too lengthy to detail here.

The questions in the second group of tables focused on identifying possible changes in vision and proposals regarding the statements made in the discussion groups; the answers were obtained during the second week of April 2020. The *verbatim* quotes were structured into three categories that seemed key to us: the effects of the IDC process as experienced by the students, that of the faculty themselves, and the identified methodological and organizational aspects. These categories, in turn, were divided into corresponding units of meaning, leading to a new content analysis process.

In both cases, the data were analyzed in a disaggregated way, anonymizing university, gender, and academic position.

We are aware of the methodological limitation implicit in the immediacy with which the interviews were conducted, since it corresponds to only one month of virtualized teaching, and when evaluation, one of the crucial facets of learning, has not yet been fully determined. However, we prioritize the value and utility of determining these first impressions regarding a change that has brought into question the information and digital skills of the university community in an unexpected situation.

4. Results

4.1. Faculty's conception of information and digital competence (IDC) and its mastery by students and themselves

4.1.1. Faculty vision of IDC of students

Faculty perceive IDC intuitively as a union of the ability to manage immediately accessible technologies, devices, and sources with the capacity for critical use of academic information. In this sense, regarding the IDC of their students, they consider that they are accustomed and predisposed to use technology, and that they have technological or instrumental competences due to their familiarity with social networks and all kinds of screens, but they consider their critical use of information to be insufficient, due to their desire to find immediate answers on *Wikipedia* or *Google*. They relate this to the digital scenarios in which the students have developed, which can satisfy their leisure or enjoyment needs, but not so much in the academic field. The faculty relate active and participative methodologies with better use and recognition of the value of the information, being able to identify that, in degrees such as Audiovisual Communication or Journalism, greater attention is given to IDC, certainly because these careers include a compulsory course on documentation in their curriculum.

Therefore, the only positive assessment would be the students' predisposition to use technology, but criticism immediately arises on their lack of competence regarding the reflective aspect:

> *They are very competent in the use of technologies, but not so much in the use of information* (UCMP6).

> *It is not that they do it wrong, but rather that they do not know how to do it in any other way, that no one has taught them, and regarding what they do well, i.e., using new technologies, they already know how to use them technically but not in informational aspects* (UCMP3).

> *This is also the result of current digital scenarios, of their rhythms: they are used to everything being instantaneous, because you are in class and you say something, and you see that they want to look it up right away on Wikipedia or Google* (UJIP3).

Faculty observe differences between a minority of highly motivated students who use information more deeply, perhaps with a higher cultural level, and the majority who limit themselves to copying and pasting or answer superficially.

> *There is always an excellent group that has its own opinion, that does not copy from Wikipedia and has worked, that gets good marks, has a high social and cultural profile, and above all a lot of motivation or vocation for the degree* (UMUP2).

> *There are different student profiles. A third of them do expand on the material I give them well; they do not extend it with a YouTube video: they go to academic articles or consult the bibliography. They even enrich me, my subject, because they provide material that may serve me better the following year, or may have greater potential than what I was proposing in the current year* (UJIP2).

In some cases, it is verified that the generation gap between faculty and students is a barrier, and that their digital use is a way of distancing themselves from faculty, academic information, and the type of tasks prescribed for them. This reaction would trigger low-involvement responses in their learning, such as copy-paste or remix.

> *Students use technologies in a way that is mysterious and generationally excluding for us. They use technology, networks, and their spaces to create a parallel world unrelated to what they are studying, to which they do not want us to have access, because it is a defensive wall that they build and behind which they protect themselves very well* (UMUP4).

Faculty strongly highlight the inability to search for information in the face of general or complex demands and the lack of questioning of the veracity and adequacy of the information they access; that is, the greatest concern is undoubtedly the lack of critical ability of the students.

> *At first it is very difficult for them to focus, understand instructions, and carry out a search, and few people achieve what is asked of them. And when it comes to discriminating information, I see that they need a lot of guidance* (UMUP5).

> *They do not contrast the sources from which they obtain the information* (UCMP6).

> *A huge group goes to Wikipedia, and their personal opinion comes copied from the Internet. And this situation does not change. I am concerned about the alienated group, those who all follow Wikipedia or share among themselves where they found the answer* (UMUP2).

> *How is it possible that first- and second-year undergraduate students cannot extract something that is in the text itself? Even for a very specific question like "What does such a thing mean?": It is there but they do not detect it* (UMUP3).

> *It is very difficult to develop that critical spirit in students when it does not fit them easily; they believe everything, and end of story* (UJIP4).

This insufficient IDC is still observed –regardless of the degree considered– in advanced courses, with their level of mastery being considering insufficient when they arrive at the FDW. Although faculty observe progress from the first to last

academic year, they still observe deficiencies in IDC even in the preparation of the FDW.

> *I am concerned that, when they arrive at the FDW, they are supposed to have done everything and already have more or less integrated tools for doing things, yet they are still at a loss as to where to look for information, especially regarding what information is good and what information is not. It even scares me sometimes to see how uncritical they are. And they are very naïve regarding everything they find; everything seems good to them* (UJIP4).

> *The FDW is a thermometer that reveals the evolution of their abilities for informative documentation and to incorporate the importance of contrasting sources, to search for sources, but it is seen that a fundamental maturity is missing* (UJIP3).

In short, faculty believe that the influence of excessive use of technology is what leads to limited informational practices, and they are concerned about the lack of critical capacity of the students, since this can also lead to an inability to exercise citizenship properly.

> *The emergence of technologies has radically changed learning and teaching methods; If text was previously the means of accessing knowledge, today this is no longer so. And this does not favor deep thinking: the screenshot, the image are totally different forms. If I ask my students about the news, they know the headlines, but they cannot go deeper because they move on to something else* (UMUP8).

> *After spending the whole semester constantly accessing reliable sources, in the final coursework they return to Wikipedia, plagiarizing again. They know that plagiarism will result in a fail, and they go back to picking up information from nobody knows where, which I later find on the Internet. I look at the wording and say "this is not yours." And that leads to a fail, and they know it, but they keep plagiarizing* (UCMP4).

> *I would be satisfied if they become critical citizens, and I try to pass tools onto the students. The observation: that they observe. It is very important that they think and observe; help them to do that* (UMUP5).

4.1.2. Faculty's self-perception of their own IDC

Most of the faculty believe that they have a good command of IDC, although some allude to a certain heterogeneity and difficulties when it comes to acquiring this competence.

> *I have good mastery, I would even say high. Because I have worried about having it for many years. I believed this was very important* (UCMP1).

> *We do not have a good command of information competence; in my case I do, but this is not generally so* (UCMP3).

> *There is enormous heterogeneity among faculty; The most advanced among us use technologies and we do so because the students use them, but not all faculty use them* (UMUP2).

> *Most of us have taught ourselves those things that we believed could be improved, and above all we were aware that we wanted to improve each year. I believe that we are prepared. The important thing for education is to have passion, that you like your job, as in all professions* (UCMP2).

4.1.3. Self-perception of faculty regarding their capacity to teach IDC

Regarding the evaluation of their own capacity to teach IDC, there is a clear consensus and the faculty are prudent and self-critical, doubting that they fully possess this capacity, which must also be constantly strengthened and updated, being conscious that it is a key competence:

> *We must know how to transmit this competence, because we are in an information and communication society; I do not know whether those who do not like this will be able to get off the bandwagon, as this is the society that we have, and all kinds of information competence are essential* (UCMP1).

> *We are not able to complete the transfer of this, because even for a FDW, which is neither a thesis nor a scientific article, sometimes I hear in conversations with other colleagues that we may be demanding something of them that we have not prepared them for, or which they are still not trained to do. I do not believe that we are transferring our information competence to the adequate and required level, considering the context and purpose of our students* (UJIP1).

Overall, they highlight the difficulty derived from overcrowding, since contrary to what was advocated by European convergence, it is still frequent nowadays to have large groups in university classrooms:

> *The volume of students is important when applying technology, because I have 110 students, and that also discourages me* (UMUP2).

4.2. Organizational and methodological problems related to information and digital competence

4.2.1. Organizational problems

A first problem that is observed is that the students arrive from secondary education with the competence already acquired, due to the influence of the technologies themselves in configuring their skills and habits:

> *Perhaps formal education is not what is educating; rather, technology itself is applying informal education, en-*

dowing our students with these skills. That is, they arrive trained, but by technology itself, not by critical use. I think that the whole dimension related to critical thinking has been excluded from the learning processes in formal education (UMUP1)*.*

Reference is also made to the precariousness of support personnel, which implies decreased continuity and coordination among faculty, as well as the individualism that has been promoted by university policies and the criteria for faculty evaluation.

The university's labor policy is also not helpful. The precariousness, having so many associate faculty, makes it very difficult for us to move forward together. Because the problem is that we do not move forward together (UMUP2)*.*

The Wert decree divides us, meaning that what we do must be registered, otherwise it is worthless. We have entered a spiral of "If I do it, then it must be reported, or I will not do it," and a spiral of lack of solidarity between colleagues, because differences are generated within the faculty of the department; we are no longer equals, and we do not share everything. And that has become "everyone for themselves," total individualism. Then the classes are given by associate faculty, the classes do not count, and each one is dedicated to their own curriculum: "I will participate in an educational innovation course if it counts for me, and I will do what counts for me, and I'm not interested in anything that does not count for me." This is terrible, because it has dynamited the objective of the group, the team and solidarity, the comradery. Previously, teaching was a joint responsibility, but that has been dynamited. Everything is individual, just as the research career is becoming more individual, there are research groups where you insert yourself and seek your own personal progress. It is difficult to collaborate in this framework... (UMUP3)*.*

The faculty consider that, despite the stated importance of IDC, there is no plan for its integration, nor is it applied, even though it appears in the course guidelines, nor is it considered that there is coordination between them for its teaching throughout the entire degree, from start to finish. They do not consider it sufficient to sometimes teach a single course in the first year (where this happens), decontextualized from the rest, as this does not achieve adequate internalization, not being linked in a coordinated way to the rest of the material.

That is another problem, the fact that it may be only one subject, and given in the first year, when it is still too abstract for them; one course per year may be better (UJIP1)*.*

The competence appears in the guidelines, but it is not applied, because we automatically copy and paste the entire list of competences from one year to the next (UMUP1)*.*

At the same time, the university community sometimes does not take advantage of the training offered by the library, and there is insufficient collaboration with librarians, which may be due to the fact that the administrative category of library staff does not recognize their educational function.

Most libraries have a great deal to offer, but it seems to me that, due to the administrative category to which they are allocated, the flow of that communication is sometimes prevented (UCMP5)*.*

4.2.2. Methodological challenges

Other problems that appear would be the artificial separation between theory and practice, which disturbs attendance and participation in classes, the size of the groups in which the material is taught, and the lack of training in IDC of the faculty.

Regarding the theory–practice separation, I am very critical. I believe that the development of a culture in this university in which only practicals are compulsory while it is not necessary to attend theory classes is very damaging (UMUP5)*.*

The problem is that faculty are often not prepared either (UJIP5)*.*

I think it will be very difficult to reach these levels of analytical reflection, considering the number of students that we have, with 90 enrolled (UJIP1)*.*

4.2.3. The institutional responsibility of the university and its services: scope and limitations

Above all, the faculty believe that training students in IDC is an intrinsic obligation of the university, in which academic services must get involved to support the faculty.

It is a mission of the university, but it is not facilitating it. If they do not come with that training ... well, they come to you as they do, and from there it is your job (UJIP1)*.*

I am left with the issue of transversality, this is transversal ... it does not matter what type of degree it is, it is something that worries me, and it is not just a question of our university, I think it is a question of the Spanish university concept (UJIP5)*.*

The faculty recognize that there are some activities related to teaching innovation and training, including proposals from the library, even if they could be improved and are not always received with sufficient involvement or commitment on the part of all faculty:

Yes, there is an intention on the part of the university to move forward. From time to time, the library offers me courses on different topics. There is quite a wide range of teaching innovation (UMUP6).

How many people are using and taking advantage of the virtual campus? To do this you need preparation, and how are you going to train your students in these subjects if you lack training? This means effort, commitment, and time investment (UCMP1).

Regarding the role of libraries in the acquisition of IDC, the response has been scant and not very encouraging. In general, faculty seem to consider that this service has had a reduced impact, not because they do not appreciate its value or believe that it is not making efforts, but because they assign it a support role, understanding that the main responsibility must be with faculty, and that the vast majority of students are quite disconnected from what the library can really offer:

Libraries are making a lot of effort. Their presence and the work they are doing seem fundamental to me, but the main limitation I see is that they still feel linked to their role or the way they developed it years ago, when there were not so many digital issues (UCMP5).

Information competence must be taught by faculty, but the university library must provide support so that, once they leave the classroom, our librarian colleagues are responsible for providing support when the students are out of the classroom (UCMP3).

The university library… Take a survey: There are students who complete their degree and have never been there (UMUP4).

I ask the students if they are going to the library, and the answer is devastating: no, of course not (UCMP5).

4.3. Organizational and didactic proposals made by faculty regarding information and digital competence

4.3.1. Organizational proposals

Regarding the proposals for organizational improvement for training in IDC, there are three main aspects. In the first place, the faculty consider that training in IDC is the responsibility of the university as an institution and is the mission of the teaching staff, emphasizing the need for a strategic plan to promote it:

The first thing is to have a strategic plan, from the rectorate team, the dean, and department teams, because leadership in change projects in education cannot start from volunteers. As there is no support from managers, this does not work, and you must rely on pedagogical leadership so that the communication project becomes global and coordinated (UMUP7).

Secondly, the need for teaching coordination is highlighted, along with the cooperation of all agents, also taking into account the university library:

You have to be united, you have to involve all the agents, and everyone is very welcome (UCMP5).

Information competence must be taught by both the faculty and the university library (UCMP6).

The compartmentalization of courses would have to be thoroughly reviewed, advocating true coordination between faculty, which would require a lot of dialogue and generosity:

Another aspect is group work: the department directors should get us together, because I have colleagues who are having very innovative experiences, but others do not even know them even though they are in the office next door. Teamwork, in teaching innovation groups, at the center level, because individual training through the Training Center is useless. Training should take place in the centers and in the department, and constituting innovation groups (UMUP7).

The courses would have to go in pairs, with two teachers in each class, and for half the hours. We would have to trick teacher planning to get two teachers together in the classroom (UMUP4).

The organization of schedules and spaces does not facilitate creativity: the university produces "industrially." But this is something that requires a more humane, more circular treatment (UMUP4).

Thirdly, the need to implement measures starting from the first year is highlighted, either through the organization of introductory workshops on certain essential IDC contents, for example, through 0.0 courses that help students to transition on arrival at university, or through curricular coordination to incorporate tasks or projects that promote IDC in all the courses on the curriculum, and even to restructure the focus on the FDW so as not to delay it so much:

In the Faculty of Law and Economics, especially in the more legal area, there is a lot of interest in providing 0.0 courses, especially on citation issues ... because they already detect this problem from the first year (UJIP4).

I have seen in England that, from the first course in the first year, a project is always included, but they make the most of that, and it works out well in the end. In the first year, there are courses that have a final project, while others do not, having a final exam and that is that (UJIP4).

> Consensus is detected in regards to three aspects: transversality, the need to motivate the students, and an emphasis on the critical dimension and the holistic perspective with respect to IDC

Perhaps the FDW is poorly focused, because it is focused on the last year, and indeed the second semester, which does not give sufficient time. The FDW should start earlier ... be more transversal (UJIP5).

4.3.2. Didactic proposals

The faculty is aware that teaching innovation must be a permanent task in tune with the current context, the technologies we have at our disposal, and the reality of the students who attend our classrooms. Consensus is detected in regards to three aspects: transversality, the need to motivate the students, and an emphasis on the critical dimension and the holistic perspective with respect to IDC.

In other words, any proposal for action and methodological improvement to address and strengthen IDC must be approached as a transversal need that should run through the curricula from the first to last year, which requires strong teaching coordination, as was reiterated in the discussion groups. In fact, it is considered that this should be part of teaching at all levels:

It must always be taught: from secondary, from primary education, in all subjects, because it is a transversal competence, and from the beginning to the end of university education (UMUP7).

This should be something more transversal. The problem of defining a concept in a course is "OK, I've already done this, and that is finished." On the other hand, if this maxim is transversal, let the degree say "In all subjects there must be at least one practical task on this, another one on that," thus being more transversal (UJIP6).

In relation to training of faculty to teach IDC, the role of collaboration and exchange of experiences stands out:

Peer training. Faculty who teach and encourage other faculty, and who see each other because they work on the same corridor, and who are collaborating, if not on projects, on concrete actions (UMUP7).

On the other hand, faculty perceive the need to motivate students, using technology as a means to achieve their involvement, encourage them so that they do not think about only "passing the course" but learning and, above all, wanting to do it, to avoid the effect that "the student seems to be turning pages, and never looks back" (UJIP4):

Conceiving the place of the classroom as a community where experiences arise, not where the faculty's knowledge is transferred (UMUP1).

I understand that they have to pass the course, that they are thinking of passing, but I would like them also to be thinking of learning and enjoying together with the faculty, addressing very interesting topics. To learn while enjoying in a context that integrates the digital with interaction and knowledge, thereby being more applicable to reality (UMUP6).

There are many tools to work on motivation, either in theory or practice. We have to sit down and talk about why they do not come to theory classes. It has to do with these dictation-based methodologies. To do that, you can just record a video, and that is it. But the class should be a different sort of place, for example, using digital ethnography or autoethnography tools, something that works very well with mobiles. I have been doing this for a few years on the Documentary Film course: an experience through Instagram called "The documentary of the day," in which they consider what happens on their way from home until they arrive at the university, what they have seen. And then they begin to observe, something that they had unlearned at some point with this continued distraction that we live through. The whole class then sees what someone is looking at. And then they have to do research, they have to shoot a documentary, they have to relate to people. This is the basis for everything else to happen (UMUP1).

In other words, this is about questioning the students, appealing to the emotional side of learning, generating situated learning experiences that include the interests and experiences of the students themselves:

Understanding media literacy involves understanding digital competence integrated with an emotional dimension. Really, the hook regarding the use of technology and how nonformal education is really training young people right now has to do with that emotional dimension. Allow me to provide a short definition of what emotional competence is, according to Área and Pessoa: Emotional competence is the set of emotional affects, feelings, and drivers caused by the experience of digital environments. These take place either through actions carried out in virtual settings, such as video games, or via interpersonal communication on social networks. The literacy along this dimension has to do with learning to control negative emotions, through the use of empathy and the construction of a digital identity characterized by an affective–personal balance via the use of technologies and the dimension of reality. It is about generating a life experience of being in the classroom (UMUP1).

At the same time, the need to go beyond an instrumental conception in the current digital environment is emphasized, and the critical dimension that must permeate this approach is highlighted, because IDC is key, holistic, and necessary for the comprehensive education of each person:

Digital skills are not just about employability or creativity, but about critical capacity, which is a matter of participatory democracy (UMUP1).

(...) we are talking about information competence, we are talking about current scenarios. We are also talking about critical thinking, the ability to reflect, and the same thing happens with spelling and writing. What we are saying is being observed in the problem of expressing oneself. (...) It is all about those powers of reflection, of basic expression... (UJIP3).

4.4. Assessment of the integration of mobile devices into Higher Education and teaching of information and digital competence (IDC)

Regarding their evaluation of the integration of mobile devices into Higher Education, the faculty agree on two essential aspects. On the one hand, they have an inevitable presence in the life of students, in how they relate to one another, consuming and sharing information, so denying that reality and avoiding mobile devices in the classroom seems unfeasible. For this reason, one must seek ways to integrate them for didactic purposes, beyond the instrumental, above all to generate or increase the motivation of students "so that they get involved and generate further value for the mobile" (UCMP2):

> At the beginning I used to say "not even talking about it in my classroom," "shame on you," or "we are in the university," and I would not allow them. And of course, it was impossible. There was a time when I had the multimedia table full of confiscated phones, and in the end I said "but what is this?". And I saw the possibility of incorporating them as an ally, [although] not as an ally 100% (UJIP6).

> The mobile is their tool, and taking away the tool they have can be more harmful than beneficial (UCMP3).

> I am considering stopping doing the practical tasks in the computer room, because they leave. You are supposed to give them the instructions and hope that they are developing collaborative learning in a group in a digital environment, and you find one looking at WhatsApp, another looking at Facebook ... I am rethinking this, and in this regard mobile phones can be very useful: set a short test that they have to answer using their mobile. The idea is to return somewhat to the interpersonal dimension, and that the digital is there, but as a support, and not the other way around. Because often it surpasses us (UMUP5).

On the other hand, the faculty perceive that it is necessary to look for tools or platforms that best connect with the students, and that platform may not only be the virtual classroom but also online cooperative work applications, such as *Drive*, as well as social communication applications such as *WhatsApp*, *Twitter*, and *Instagram*:

> They consider the virtual classroom to be strange. I notice it a lot. I would like to investigate this: how to create a space like Drive, a space that is more theirs. Because they end up using the WhatsApp group for the class, and that's it (UJIP3).

> Because it is not interactive [referring to the virtual classroom]. It just lets you be interactive on the forums, which are like a fossil to them. They are not going to write in a forum; that is what we did when the Internet started (UJIP4).

> More than being outdated [referring to the virtual classroom]… We are not able to update it either. They need something more interactive. The virtual classroom may be, but we do not know how to do it (UJIP6).

> The secret will be for us to become able to go where they are, and not wait for them to come to where we are ... rather than "stop using Instagram and come to see an educational application created by the University of Massachusetts" (UJIP4).

In this sense, the faculty provide as an example of motivation and positive dynamism in the classroom some experiences they have had when they made use of platforms and spaces that the students typically use in their daily life and with which they connect directly, and that can offer a means of accessing valid resources:

> I did this last year for a course on protocol and event management, where we analyzed series using Instagram. For example, Downton Abbey, and they were really active (UJIP5).

> I realized this in an optional fourth course on tourism marketing ... at one point we presented dark tourism, which involves visiting murder scenes, cemeteries, etc., and their eyes widened like saucers, as if "this guy is crazy." Until a girl raised her hand and said: "yes, there is a documentary on that on Netflix." I had not seen it. Wow, when I arrive at the office the first thing I do is to search, and indeed there is, not a documentary, but a series of documentaries on black tourism sites. Well, the following week they were all experts in black tourism because they had seen them all, can you believe it? (UJIP4).

In other words, the idea of listening to the students themselves arises to propose initiatives in the classroom that can better connect and generate motivating and dynamic learning experiences:

> In the Protocol course, I have removed the practical tasks they used to do, and I put Game of Thrones in English with subtitles, and they love it. And they have learned the provenances, vexillology, how the flags fly ... (But) do you know why I did it? Because I listened to a student, and he helped me (UJIP5).

Relating to all this, the faculty point to the need for self-training, to stay up-to-date and experiment, and there are also voices that highlight the need for the university, as an institution, to coordinate the drive to promote IDC:

> We agree that this is fundamental, that the digital issue must be incorporated, be it via mobile phones or other technologies, but also that we are divided and separated, and that it is the university that should unite us; we need a plan, and to coordinate and share our experiences (UMUP2).

4.5. Information and digital competence and virtualization of teaching: assessments during lockdown due to Covid-19

4.5.1. Effect on IDC of students

The total virtualization of teaching has not resulted in great technical setbacks for students, although this exceptional situation has revealed a certain gap and vulnerability in a minority that do not have a computer at home or access to the Internet. But the vast majority have adequate computer equipment and are used to operating in virtual environments. However, overall, teachers do not perceive an improvement in student IDC as such:

> *Students have very significant deficits in information and digital competence*

I do not think that student skills have increased greatly. In any case, slightly at a general level and maybe specifically for certain individuals. But globally, little or very incidentally (UCMP1).

At the moment, I do not think that the information competence of the students has increased, I see them as not very autonomous, and I think they are still adapting (UJIP1).

I do not perceive a change in the information competence of the students. They are reacting to an abrupt and limiting change in circumstances, but using tools that are somewhat natural to them. Online communication, tutoring by messages ... (UMUP4).

Definitely not. I think it has even gotten worse. (...) I see that students create a kind of invisible barrier between their lives and the lessons. These days I have seen how, after two face-to-face months seeing reliable sources of information, when doing an exercise they return to Wikipedia. I think that, when they feel less watched they relax, forget what they have seen, and return to old habits (UCMP4).

I believe that the result of these processes must lead to an increase in the information competence of the students. We are working on this. Together, we need to help them increase it, but they need to change many habits (such as not reading, listening, or viewing the materials provided to them well) (UJIP3).

I have not observed major changes in the way students access, analyze, and communicate information. Although they are very competent in the handling and use of mobile devices to connect and communicate via different social networks (and for playful and recreational use), they are not so competent when it comes to more academic and/or professional uses (UMUP8).

I have little information from the students, but I get the feeling, because of some of the tutorials that I am giving, that they are more concerned with looking for information "on their own" apart from what we already provide them through the virtual classroom. I still have serious doubts regarding whether they can efficiently separate "good" from "bad" information (UJIP4).

However, it appears that students are more involved in the learning process, not homogeneously, but noticeably so, especially in terms of their level of attention and forms of organizing themselves:

I do see that a small group has taken the reins of their learning very decisively. This is the group that participates, analyzes the material, works on it, connects, and interacts (UJIP1).

In the first year, they have focused much more on the practical tasks and have become more accustomed to understanding the instructions. (...) focusing and working hard on tasks is something where there has been an improvement, from the first to fourth year (UMUP5).

Commitment is quite high, mainly due to worry and uncertainty caused by the unknown (UMUP8).

The involvement with the courses has grown exponentially. They have a need to keep things "up to date" that I have never observed before (UJIP4).

At least it is easier for them to realize the importance of preparing for classes and mastering the tools and materials provided for their learning. They are taking the reins, realizing the meaning of that phrase that, when you repeat in face-to-face teaching, they do not end up assimilating: "that they are the protagonists of this process" (UJIP3).

4.5.2. Effects on the IDC of faculty

Despite the stress generated by this unforeseen circumstance, the overload of work that the preparation of materials has entailed, and the added effort to reconcile work and family life in many cases, faculty are satisfied with their accelerated adaptation to virtual teaching. The vast majority already used the virtual classroom, and there was a blended-learning point from which to depart in many cases, so this immediate need has caused one to stop and reflect to identify the best training pathways, under the circumstances. Thus, a positive disposition has been generated to learn how to use platforms and tools that they have not tried, an openness to flexibility, and to continue learning to improve the training process of their students:

> *Faculty report difficulties in teaching information and digital competence*

> *The lockdown has required an "accelerated course" not only in virtual teaching tools and instruments, but also in skills, methodological approaches, and confidence in virtual teaching media. (...) Once the ice was broken, it was easier and more positive than I expected* (UMUP3).

> *I am happy, because for a long time I had wanted to try video explanations for the students who could not come to class, or as a complement to classes. In my case, the use of nonverbal elements that complement the verbal information is very important, because the course content is in English, which requires a lot of supporting structures that could be ensured in class, but not at a distance. My experience so far has been good, at least with my group of students. But I do see that this is only the beginning of a long road that I have to travel, both to learn the possibilities that I have and to know how to accompany the students in their access and use of all the tools available to us* (UJIP1).

> *This situation has made us aware of something that we really should have known: that the university was already blended, but that we were not adapting the teaching dynamic well enough to that reality. I also perceive that those who had the most structured and guided teaching can transform it online more easily. This process has been satisfactory, above all at the level of the "learning community" and "community of trust"* (UMUP4).

> *I see my teaching style as fundamental. There are some circumstances resulting from these conditions that I am perhaps incorporating from the normality and flexibility that these environments imply (such as that, at a certain point, the students are following your class from the balcony, as long as you see that they are attentive and involved), which perhaps other teachers would not take as well. And I feel that I still have a lot to learn and a long road to travel* (UJIP3).

> *This parenthesis has made me see that combining face-to-face with virtual approaches seems to be the best method when it comes to teaching to facilitate information competence* (UMUP5).

> *I am very satisfied with what this adaptation of teaching to the virtual context has meant, and I continue working to learn and improve* (UMUP6).

> *Given the circumstances and this kind of "emotional shock" that we are living, I believe that the reaction of everyone (faculty and students) is very positive. Those who usually resist virtual relationships are making an enormous effort to update themselves, and we are all understanding that each person has a different rhythm, being understanding* (UJIP4).

And, in parallel, in an important way, this experience has raised awareness of the importance of IDC and reinforced a critical conception of it, lying beyond instrumentalism:

> *This situation has brought the importance of information competence to the forefront* (UJIP3).

> *The key is not in the technology; it lies in the teaching and didactic methodology, in the coordination between faculty, and the flexibility to adapt to new and changing environments. The work that the coordinator of each course must do and following the teaching guide but adapted to the new situation are essential: pedagogy is more important than technology* (UMUP7).

4.5.3. Organizational and methodological aspects

At the organizational level, generally no problems have been detected and the support of the computer services of the universities has been valuable and well valued by the faculty. In addition, the universities have supported those who were in vulnerable situations, through the loan of laptops or even Internet connections.

Regarding methodological issues, the sudden nature of the adaptation to virtual teaching has generated a diversity of didactic approaches in the current, still somewhat incipient phase:

> *Regarding digital progression among faculty, there have been extreme cases, both of abuse of virtual tools (excessive tasks and recorded videos), and of default use, when virtual teaching has only been seen in the uploading of material to the virtual classroom. I believe that, in the period that remains of virtual lessons, there will be greater homogeneity and balance, making better and greater use of the virtual tools* (UMUP2).

Among those who are fully involved in energizing their virtual teaching, a concern to find the best ways to relate to students (especially when it comes to large groups) and generate new participatory dynamics stands out, always based on a whole-hearted disposition to improve the teaching and to continue learning:

> *I miss feedback from students. They participate very little, both in the forum that we have set up for questions and answers and in the review sessions through Google Meet. Reflection has led me to think that we will have to devise some system to make that communication between them and us more fluid. (...) I have realized my lack of training, since I am not aware of tools that I am sure would allow me to encourage greater participation by students and, therefore, increase that feedback* (UJIP1).

> *It is highly satisfactory. I had to roll up my sleeves and get out all the tools that I had ready to apply (PlayPosit, for example). It has shown me the importance (that I already knew about) of*

" IDC is key and transversal, so its training should begin and be promoted in the educational stages prior to university "

the information competence of faculty, as well as teaching innovation. If, being a "whizz" in these environments, I am sweating blood to find the most suitable spaces, dynamics, and methodologies to transfer my face-to-face to distance teaching in record time, I suffer for my colleagues who I know find it difficult (UJIP3).

The classes are taught via Collaborate or Google Meet, and I make them shorter, because students find too difficult to maintain attention if they are long. Regarding commitment, I think it has decreased with respect to face-to-face. They take longer, and you have to provide constant encouragement through mass emails and notices (UCMP1).

Finally, first of all, although there is still a long way to go, faculty are convinced that the situation generated by the pandemic will represent a turning point in teaching, and that some tools or modes of teaching that are being implemented now due to these circumstances in fact will form part of their future teaching practice:

I am sure that the coronavirus has done more for virtual teaching than two decades of effort. This semester has changed everything (UJIP6).

The lockdown has resulted in an unexpected advance in virtual teaching that will continue into the future. This experience should result in a reflection on the low attendance of students at face-to-face classes for certain degrees and, therefore, the introduction of virtual teaching to a greater extent, rethinking current teaching/learning models (UMUP3).

In addition to my regular use of the virtual classroom as before Covid-19, I will incorporate the recording of theoretical classes and practical workshops on some occasions when I must attend a congress or have a similar academic commitment (UMUP6).

These circumstances have forced me to put into practice a suggestion from the students for which I had not had time: to combine written with video explanations. To support them well using highly visual and complete instructions (without overly annoying or becoming too complex) and to constantly follow-up: that they feel close to me, continuously between classes. I do not know if I will be able to communicate in a purely written way again. The audiovisual has taken me over... We should not fall into the trap of simplifying or TikTok'ing, with the explanations and learning patterns maintaining their demands and depth (UJIP3).

5. Conclusions and final thoughts

5.1. Students have very significant deficits in information and digital competence (IDC)

According to the reflections raised by the faculty participating in this study, in both the discussion groups and interviews, a concern to promote critical thinking by the students in relation to their IDC is clearly evident, where great deficiencies are observed in all the degrees of the sample, from the first to last year, and even in the final stage, the FDW. Students are used to technology, and predisposed towards it, since it is part of all areas of their daily life, but this constant, instrumental use is not accompanied by reflection and rigor in the academic field. Concern is not only focused on how this affects the training of students in Higher Education but also, in a broader sense, its importance for the exercise of citizenship. Students who use technology but do not reflect critically are not empowered for the responsible and ethical exercise of citizenship, nor to provide added value in their future professional roles.

Technology can be an important and enabling medium, but what is essential is critical thinking, which would allow students to advance, in the future, based on personal autonomy. The continued use of technology, from stages before Higher Education, configures rather technical habits and skills, and a predisposition towards the digital, but this is not accompanied by a solid basis regarding the use, management, and production of information, meaning that students arrive at university with a deep need to improve this critical-reflective aspect.

> " A concern to promote critical thinking by the students is clearly evident, where great deficiencies are observed in all the degrees of the sample, from the first to last year, and even in the final stage, the FDW "

5.2. Faculty report difficulties in teaching information and digital competence (IDC)

Most faculty in the sample consider that they have a good command of IDC, which they have acquired in various ways, based on self-training, to update themselves as they move forward in their teaching and research careers. But they are cautious and self-critical regarding their own teaching competence to transmit IDC, while attesting to the complication added by overcrowding in classrooms for many subjects, despite the intentions of European convergence.

The study highlights that they are aware of the key role played by IDC, and the need for recycling, continuous training, and permanent updating, in the complex, changing, and lively environment of the information society.

5.3. The university must more comprehensively take responsibility for the organizational and methodological aspects of teaching information and digital competence (IDC)

There is a clear consensus that IDC is key and transversal, so its training should begin and be promoted in the educational stages prior to university. And, in this area, the faculty understand that IDC is the responsibility of the university as an institution.

It has been verified that there is a gap to be addressed, given the heterogeneity at student and faculty levels, thus the faculty highlight several organizational proposals to promote and substantially strengthen IDC:

- IDC must be part of the university's strategic plan, as an institutional commitment, with collaboration from all the agents that may be involved, to offer, among other things, faculty with continuous training related to IDC that will be reflected in the training offered to students.
- The need to take advantage of the full potential of the university library (staff and resources) is evident, but based on leadership from the faculty, thus generating synergies between the two to promote its role among the academic community and enable it to connect more with the students.
- IDC must be present throughout curricula from the first to last year. For this reason, it is important to implement measures such as the organization of 0.0 courses that help students adapt to their arrival at university, and via curricular reviews to enable the insertion of IDC into curricula, based on their transversal nature.
- Faculty reaffirm that coordination is a key aspect that must be strengthened. Likewise, this would have to be led by management teams to promote deep dialogue and intense cooperation, while it could also alleviate problems that derive from the precariousness of faculty positions.

Regarding methodological issues, despite the difficulty derived from the unreal separation between theory and practice, as well as the overcrowding of the classrooms in many subjects, the need to seek active and participative teaching methodologies to motivate student learning is highlighted, thus appealing to the emotional component of learning (**Área**; **Pessoa**, 2012). To achieve this, mobile technologies can be integrated for didactic purposes, but faculty clearly aim to go beyond instrumentalism (**Adell**, 2018; **Castañeda**; **Esteve**; **Adell**, 2018). They aim to seek tools, platforms, and resources that connect with students, close the generation gap, and approach their spaces, always for didactic purposes. In this sense, it is worth listening to the students, value their ideas, and use them to benefit the training, to question and motivate them, remind them that they are protagonists in their learning process, and accompany them from beginning to end. This leads us to metaliteracy as a proposal for an integrative approach for IDC (**Jacobson** *et al.*, 2020), which emphasizes the capacity to produce and share information in collaborative and participatory environments, and the recognition that the learners are also teachers.

> The university must more comprehensively take responsibility for the organizational and methodological aspects of teaching information and digital competence

5.4. During the Covid-19 pandemic, doubts persist regarding the capacity for critical and contrasted use of information in the context of virtual teaching

Despite the demands imposed by the uniqueness of the current times and the difficulties entailed, it should be noted that faculty are making efforts to adopt or change their teaching practices. It seems that the students have adapted well to the virtual format, precisely because they are used to virtual environments and the technical dimension. However, concern persists about the lack of critical capacity regarding the IDC of the students.

Faculty have noticed an improvement regarding the commitment of the students. Perhaps due to uncertainty and concern, they have taken the reins and improved their attention and ways of organizing themselves to follow the course in the midst of this unexpected situation that has led us to full online teaching.

Regarding themselves, and despite the difficulties, faculty are mostly satisfied with this jump without a safety net that they have had to take. Although these findings should be confirmed based on broader samples after the difficult process of massively virtual evaluation that will take place at the end of the course, it has been considered relevant to report this perception "live," while the teaching-learning process is underway. It has been gratifying to note that the majority of faculty who participated in this study declared a positive predisposition towards adaptation, learning, and flexibility to redirect teaching, and continue learning to teach how to learn, understanding that e-learning is not only virtualization of material but a commitment as a teacher.

It also seems remarkable to us that, in this situation, faculty have continued to stress the importance of looking for didactic approaches that generate more participative dynamics, an aspect that worries them and which they are working to improve. And they accept that the pandemic will mean a change in their future teaching practice, since they will incorporate into it some tools or methodologies that they are beginning to use now.

At the same time, this extraordinary moment has made teachers more aware of the importance of IDC, since the situation has put it on the front line, further emphasizing that the key lies in promoting critical thinking, beyond the instrumental aspect.

However, in this context, we find one absence from the responses to be striking: the lack of mentions of the university library, to which faculty did not refer to appeal to its possible role as a facilitator of material or guidance in student work during this stage of virtual teaching.

> During the Covid-19 pandemic, doubts persist regarding the capacity for critical and contrasted use of information in the context of virtual teaching

Unfortunately, this would be in line with the insufficient impact or visibility of this service, at least in the mind of faculty, which we have detected during this research. If this is so, we conclude that the library must better communicate its services and abilities to support learning –both face-to-face and virtually– and seek new strategies for cooperation with faculty.

> The library must better communicate its services and abilities to support learning –both face-to-face and virtually– and seek new strategies for cooperation with faculty

5.5. Information and digital competence (IDC) is a key component of inclusive and sustainable societies that apply knowledge for the common good

The critical changes that the coronavirus pandemic is causing at all levels are going to mean a before and after, also in university teaching and regarding the role of IDC. Not surprisingly, a very worrying infodemic has emerged that as a society we must learn to reverse, precisely by becoming aware of the key role that IDC should play in education. There is thus an urgent need to remember and highlight the importance of education in ethical values, to learn how to exist and act in this networked society, which must generate participative and collaborative dynamics from dialogue, conversation, and critical thinking. This crisis that surrounds us is also an opportunity to rethink ourselves, to rethink our teaching practices in Higher Education, emphasizing that ours is a living profession that requires constant learning and an ethical commitment to teaching, being at the same time a commitment to democratic society.

In this liquid world (**Bauman**, 2007; **Gnutti**, 2016) in which post-truth is gaining ground, it is time to become aware of how vulnerable we are if we do not strengthen our IDC, that of our students, and that of our everyday environment. It is a key, holistic competence, essential for daily life, citizenship, education, the workplace, and health.

It is important and necessary to talk about IDC with those around us and claim it in everyday spaces to promote reflection, precisely because of its connection with life, citizenship, the workplace, and health. In short, this means facing all that happens to us by striving to be part of an informed, committed, and empowered citizenry, wherever we live, in any context and circumstance. A citizenship that can help combat social exclusion, disinformation, and fake news, to pull in the direction of an egalitarian and fair society, where stereotypes have no place, based on rigor and information ethics. For this reason, as teachers, we must value IDC and demand it more than ever. The objective is not only to help students meet their academic needs, but to plant a seed and help them become aware of what IDC is, its importance, and its profound and transformative reach throughout their education, but also in their personal lives and as future professionals, lifelong learners, and, above all, citizens of a world that will never be the same again.

> Information and digital competence (IDC) is a key component of inclusive and sustainable societies that apply knowledge for the common good

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