Domingo-Coscollola, M., Sancho-Gil, J. M., and Soler-Campo, S. (2025). The challenge of teaching and learning at university. Students' perceptions of the use of digital technologies. *Revista de Investigación Educativa, 43*
DOI: https://doi.org/10.6018/rie.590741

The challenge of teaching and learning at university. Students' perception of the use of digital technologies.

El reto de enseñar y aprender en la universidad. Percepción del alumnado en torno al uso de las tecnologías digitales

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Abstract

The present study, based on the TRAY-AP project, explains the role of digital technologies (DT) in the learning process of university students. From a collaborative and inclusive perspective, we have developed 50 learning trajectories with university students from Catalonia and the Basque Country (Spain) as a result of several meetings (usually four with each student). Based on the analysis of the transcripts of the meetings and the documents produced by each participant, the researchers wrote their learning trajectories which were then validated by each student. Drawing on the data obtained from the trajectories, we provided results on the role of DT in the personal and social life of students, and in their learning process. The main conclusions show the need to rethink the notion of knowledge, the dimensions and methodologies of teaching and learning at university, and the role of DT and Artificial Intelligence. The current

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challenge is an educational transformation to achieve a more inclusive, participatory and humane university in which students learn with meaning and responsibility for themselves and the world surrounding them.

Keywords: Higher education; university students; learning; digital technologies; digital literacy.

Resumen

Este artículo, basado en el proyecto TRAY-AP, da cuenta del papel de las tecnologías digitales (TD) en la vida de aprendizaje del alumnado universitario. Desde una perspectiva colaborativa e inclusiva, hemos desarrollado 50 trayectorias de aprendizaje con estudiantes universitarios de Cataluña y el País Vasco (España) fruto de varios encuentros (generalmente, cuatro con cada estudiante). A partir del análisis de las transcripciones de los encuentros y de los documentos producidos por cada participante, los y las investigadoras redactamos sus trayectorias de aprendizaje que después cada estudiante validó. Aportamos resultados de estas trayectorias sobre el papel de las TD en la vida personal y social del alumnado, y en su proceso de aprendizaje universitario. Las principales conclusiones evidencian la necesidad de que la universidad se replantee la noción de conocimiento, las dimensiones y metodologías de enseñanza y de aprendizaje, y el papel de las TD y de la Inteligencia Artificial. El reto actual es una transformación educativa para lograr una universidad más inclusiva, participativa y humana en la que el alumnado aprenda con sentido y responsabilidad con él mismo y con el mundo que le rodea.

Palabras clave: Educación superior; estudiantes universitarios; aprendizaje; tecnologías digitales; alfabetización digital.

Introduction

In contemporary society, learning takes place continuously across the length, breadth and depth of life without being confined to educational institutions (Banks et al., 2007). Digital technologies (DT) have mainly contributed to breaking down and extending the temporal and spatial boundaries of learning. Learning is now blurred in and between different contexts where DTs are increasingly naturalised and invisibilised. Moreover, the learning experience of university students is growing in complexity with new pedagogies and technologies in a multitude of contexts (Han and Ellis, 2020). Thus, each person inhabits their own learning ecosystem (Sancho-Gil and Domingo-Coscollola, 2022) and, in this increasingly digital world, the human relationship with technology becomes much more complex (Marín and Castañeda, 2022).

For decades, there has been clear enthusiasm about the opportunities and benefits of TDs in education, development and youth learning, while critical positions on their impact on people's lives are growing (Arënliu and Bërxulli, 2020; Desmurget, 2020; Henríquez et al., 2022; Sawchuk and Samuels, 2020; Sikali, 2020; Twenge, 2017). Issues have increased as a result of intense digitisation and virtualisation during COVID-19 confinement. Among others, TDs are causing emotional problems (Sikali, 2020), addictions (Alter, 2018; Li et al., 2020) and dispersion and superficiality (Desmurget, 2020). UNESCO (2023) already stresses the need for clear objectives and principles to ensure beneficial use of technology and avoid potential harm. Unregulated technology even poses a threat to democracy and human rights, e.g. through invasion of privacy and incitement to hatred.

The vast majority of university students were born after the advent of the Internet, in an increasingly digital world. They are interested in social justice issues (Seemiller and Grace, 2016) and gender identity (Guerra-Santana et al., 2021). They are growing up in a volatile, uncertain, complex and ambiguous social, political, economic and technological context (Lemoine et al., 2017). At the same time, it has access to more information than any other generation through TDs (Seemiller and Grace, 2016). With the COVID-19, these technologies have acquired a more relevant role in their lives. Thus, TDs are transforming people's lifestyles by reshaping personal, social, educational and professional environments (Adams et al., 2021; Castañeda and Williamson, 2021; Dafonte-Gómez et al., 2021; Dogan, 2019; González-Limón et al., 2022; Guerra-Santana et al., 2021; Killian, 2020; Pozo-Sánchez et al., 2022).

In this new context, there is a need to take into account (in the educational processes) the needs and challenges posed by a society that is changing at an unprecedented speed (Marcelo and Rijo, 2019). Also, to contemplate how the meaning that university students give to learning, knowledge and TD inside and outside the university is being transformed. And in turn, consider how their learning is linked to and influenced by experiences outside the classroom. Hence, it is important for university teachers to increase their understanding of the world of young learners and its influence on their ways of learning.

Ubieto (2023) suggests the need to improve our knowledge (about the reality that today's youth live with the omnipresent TDs) in order to accompany them in their socialisation, learning and mental health processes. There is also a need to consider digital competence so that students can develop responsibly and with informed criteria (Domingo-Coscollola et al., 2020; Gómez-Galán et al., 2021; He et al., 2021; Leaning, 2019; Sáiz-Manzanares et al., 2022).

For all of the above reasons, and considering the dimensions involved in current education systems, it is essential to broaden and deepen our knowledge about university students, what their learning ecologies are, and how they use, consume and are affected by TD. These issues, among others, are investigated in the R+D+i project on

which this article is based: "Trajectories of learning of young university students: conceptions, strategies, technologies and contexts" (TRAY-AP). In this text, we report on the positioning and the relationship with TDs of university students in two autonomous communities in Spain (Catalonia and the Basque Country). We focus on the experiences and perceptions of the role of TD in their personal and social life, and in their university learning process.

Methodology

The aim of TRAY-AP is to reveal how students in today's universities learn from their learning trajectories, assessing their conceptions, strategies, technologies and contexts. It starts from an onto-epistemological and methodological position based on a relational and performative ethic (Geerts and Carstens, 2019). This position implies considering the other (in this case, the collaborating university students) as a bearer of knowledge and experiences. Hence, it adopts a participatory and inclusive research perspective (Nind, 2014).

Participants

In the first phase of the project, on which this text is based, 50 students from universities in Spain participated (Table 1).

Table 1

Profile of collaborating students from the University of the Basque Country (UPV) and universities in Catalonia

Number and of pupils	Areas of knowledge [no. of students] [no. of students] [no. of students	Universities to which they belong number of students] [no. of students
30 women 20 men	Social sciences and law [18]. Engineering and architecture [5] Arts and humanities [12]. Health sciences [6]. Science [6] Double degrees [3].	University of the Basque Country [22]. Universities of Catalonia [28] Autonomous University of Barcelona (UAB) University of Barcelona (UB) University of Girona (UG) International University of Catalonia (UIC) Open University of Catalonia (UOC) Polytechnic University of Catalonia (UPC) Pompeu Fabra University (UPF)

Specifically, 22 participants from the University of the Basque Country and 28 from the universities of Catalonia took part in the project. Of these, 30 were women and 20 men aged between 18 and 25. This is a sample close to the distribution observed in Spanish universities in the academic year 2021-22 (Ministry of Universities, 2022). Moreover, the selection of areas of knowledge in our sample (table 1) follows the

distribution defined in the report of the Ministry of Universities (2022).

The design of this research requires collaborators who are geographically close to the research team. Only students from the two autonomous communities indicated participated because this is where the two teams involved in the TRAY-AP project are located. The selection of participants followed the chain referral method (Penrod et al., 2003).

The sample responds to the onto-epistemological, pedagogical and ethical positioning of the research and to the demanding intensity of involvement of each collaborator. In this research, the participating university students made three commitments: to have time for four meetings/interviews with one person from the research team, to be willing to share their visions and experiences of their learning, and to take responsibility for visually or textually documenting their life and learning strategies.

Strategies and procedures

In the negotiation process, the researchers agreed with the collaborating students when and where to hold the meetings. In general, they were held in person. We progressively started the meetings (with each of the 50 students) at the end of 2020 and concluded them at the beginning of 2023. In general, the research team held 4 meetings with each partner, focusing on the development of their learning trajectories. Thus, in the end, we conducted a total of about 200 meetings from the perspective of creative practice (Masschelein and Roach, 2018).

In the first meeting, the student collaborators completed and signed the TRAY-AP participation consent form. Afterwards, the researchers proposed a conversation from the perspectives of Education Studies, Sociology and Psychology (Desmurget, 2020; Seemiller and Grace, 2016; Twenge, 2017). Before the end of this first meeting, the research team proposed that in the second meeting they should talk about their learning life. Therefore, beforehand, the partner needed to reflect on and briefly document his or her learning journey (Figure 1). To do so, they could use narrative, visual and arts-based methods (Banks, 2008; Wang et al., 2017). Most constructed their trajectory visually.

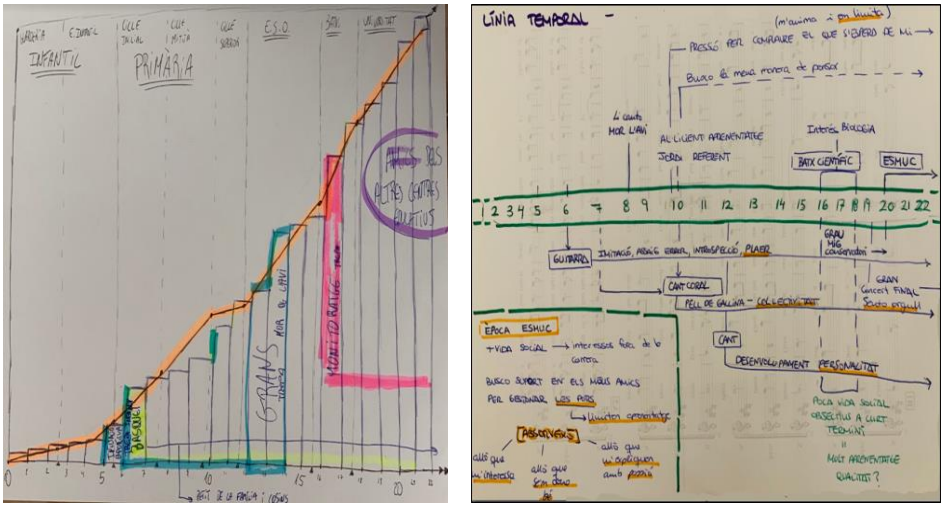
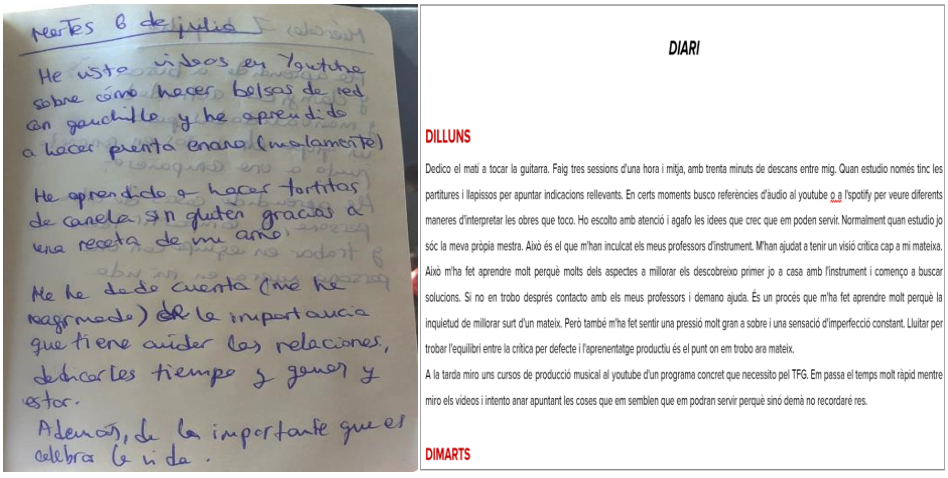


Figure 1. Examples of learning lives.

In the second meeting, based on the story of their learning life, each collaborator talked with the researcher about the moments, materials, forces, people, affections and situations that influenced or had influenced their way of learning. Before the end of the session, the researcher proposed to create, for the next meeting, a field diary of the most significant episodes of their study strategies and ways of strengthening their learning (Denzin, 1997). This diary could be multimodal, but most of them did it textually (Figure 2).



Martes 6 de julio

He visto videos en Youtube sobre cómo hacer bolsas de red con ganchillo y he aprendido a hacer puenta enana (malamente)

He aprendido a hacer tortitas de canela sin gluten gracias a una receta de mi amo

Me he dado cuenta (me he reafirmado) de la importancia que tiene cuidar las relaciones, dedicarles tiempo y ganas y estar.

Además, de la importante que es celebrar la vida.

DIARI

DILLUNS

Dedico el matí a tocar la guitarra. Faig tres sessions d'una hora i mitja, amb trenta minuts de descans entre mig. Quan estudio només tinc les partitures i llapissos per apuntar indicacions rellevants. En certs moments busco referències d'àudio al youtube o a l'spotify per veure diferents maneres d'interpretar les obres que toco. Ho escolto amb atenció i agafo les idees que crec que em poden servir. Normalment quan estudio jo sóc la meva pròpia mestra. Això és el que m'han inculcat els meus professors d'instrument. M'han ajudat a tenir un visió crítica cap a mi mateixa. Això m'ha fet aprendre molt perquè molts dels aspectes a millorar els descobreixo primer jo a casa amb l'instrument i començo a buscar solucions. Si no en trobo després contacto amb els meus professors i demano ajuda. És un procés que m'ha fet aprendre molt perquè la inquietud de millorar surt d'un mateix. Però també m'ha fet sentir una pressió molt gran a sobre i una sensació d'imperfecció constant. Lluitar per trobar l'equilibri entre la crítica per defecte i l'aprenentatge productiu és el punt on em trobo ara mateix.

A la tarda miro uns cursos de producció musical al youtube d'un programa concret que necessito pel TFG. Em passa el temps molt ràpid mentre miro els vídeos i intento anar apuntant les coses que em semblen que em podran servir perquè sinó demà no recordaré res.

DIMARTS

Figure 2. Examples of learning diaries.

During the third meeting, each of the collaborators presented the characteristics of the most significant learning strategies and moments. The explanations were usually interspersed with questions from the researcher about their conceptions, strategies, technologies and contexts. All sessions were recorded and transcribed. The researchers wrote the learning trajectories of each of the collaborators based on the dialogue with the transcripts, the field notes and the documentation provided by them.

In the fourth meeting, the research team shared the learning trajectory created (of each collaborator) so that the collaborator could contribute or modify whatever he/she considered appropriate. In general, the fourth session ended with the partner ratifying their learning path.

Analysis of the information

The analysis of the trajectories was carried out manually on the basis of a thematisation of all the information generated (Nowell et al., 2017). During the analysis, we found that the ideas do not function as watertight compartments, but are fully interrelated and intra-acting. Barad (2007) uses the term *agential intra-action* to refer to how the component parts of a phenomenon do not precede it as separate, predefined agents, but emerge and shape each other as they become entangled in it. Thus, in this research, we explore a complex phenomenon where all actors and actors - human, non-human and material - affect and have a role to play (Van der Tuin and Dolphijn, 2012).

Results

In this section, we provide the most significant assessments of the role of TDs in students' lives and in their learning process at university obtained from the 50 learning trajectories elaborated. The names that appear in the following quotations are pseudonyms.

Possibilities of TDs in the personal and social life of university students

Technologies have always been present in the lives of the collaborating students: "*I have grown up with everything audiovisual*" (Adara, Anthropology), "*I have learned with technologies" (Maura, Education), "mobile phones and social networks have allowed me to interact and socialise*" (Mikel, Computer Engineering). Since they were young, they have already played with them: "*when I was little, I saw an advert that said, you want to have Nintendo; I thought it wouldn't be bad and I downloaded the programme*" (Carles, Computer Engineering), "*when I was a child I played with the Game* Pokemon" (Mikel, Computer Engineering). They also highlight its influence on their lives: "*Youtube has had a huge impact on my adolescence*" (Adara, Anthropology) and how it has helped them: "*When I was little, I used to read a lot in the library; for some time now, I have been listening to 'white noise' so I can read in different places like public transport*" (María, Fine Arts)

Nowadays, digital devices and media are an integral part of their lives: "*We are always listening to music, doing something, talking, watching videos*" (Leo, Conducting). They have and positively value mobile phones, tablets, laptops and other digital devices. They use them mainly to communicate and search for information using different languages: "*Technologies can act as mediators and facilitators of communication*" (Marina, Philosophy). TDs are becoming naturalised as a main source of information and use in the classroom: "*If you use the computer, you have many more resources at your fingertips, you can get more information*" (Ianire, Pedagogy).

As a result of the pandemic, TDs are even more present in their lives. They mainly use mobile phones for instant communication, searching the Internet, using social networks, and viewing and/or creating videos or images, and also as a means of escape and play: "*Devices such as mobile phones or social networks [...] allow us to delve into information in a different way and access information immediately*" (Aritz, Conducting and Performance).

Generally, they emphasise that TDs (especially social networking and instant messaging) impact on lifestyles and learning by offering beneficial socialising features. However, they point out their dependence and the importance of using them in a reflexive and critical way: "*The influence will depend on your capacity for analysis and reflection. [...] we have to know how to use them for the benefit of others and ourselves*" (Mireia, Classical and contemporary music).

Weaknesses of TDs in the personal and social life of university students

A majority of the employees consider that they are significantly dependent on TDs, even making excessive use of them: "*We are always [...] overusing social networks with mobile phones, computers or tablets" (Leo, Orchestra Conducting). They stress that they cannot live without the mobile phone: "Your person is that little object [the mobile phone], it's like your mini-me, literally*" (Angela, translation and tourism). Some describe how its influence brings about changes in their lives. For example, the loss of reading habits at the end of childhood:

> *A: Until I was 9 or 10 years old, I read a lot. At the end of primary school and the beginning of high school, I stopped reading altogether [...].*
> *Q: Does this stop coincide with your first mobile phone?*
> *A: The mobile phone hurt me a lot [...] it took up a lot of my time* (Blai, Economics).

At the same time, they emphasise the problems of their use: "*I am very aware of the dangers of some technologies and very reserved about their use*" (Yaiza, Computer Engineering) **or** "*Now, it is easy to get hooked with a passive attitude, but when I was little I used to look for ways to entertain myself and this made you stimulate*" (Anna, Medicine). Therefore, they stress the importance of controlling their influence (for example, on their moods or opinions): "*Devices and networks make you have more things at your*

fingertips, although you have to learn to control management and know that there is a lot of misinformation" (Ianire, Pedagogy). Also, the need to be critical: "*what we see with the mobile is to be consuming or to obtain happiness, when there are a lot of other things that can give me happiness*" (Norah, Sociology)**.** They notice the continuous interference of mobile phone use that affects their concentration and causes them to waste time: "*WhatsApp is causing interference [...] many people are wasting too much time*" (Mireia, Classical and contemporary music).

Above all, as a result of the pandemic, they miss human proximity due to the high use of TDs: "*I think that face-to-face, face-to-face human contact does not happen over the Internet*" (Jordi, Derecho). This lack of contact has particularly affected them: "*I'm not much of a phone or screen person [...]. So, during the pandemic, I personally had a fairly bad time*" (Kareem, Graphic Design). Thus, they highlight the dependence that some of them have on mobile phones: "*The need they have to be glued to a mobile phone. It worries me*" (Maura, Education). Moreover, they regret that this dependence causes different losses such as not paying attention to their interlocutors: "*All the time I have been paying attention to my mobile phone I have lost information about what a person is telling me. [...] I find that sad*" (Cloe, Fine Arts).

Possibilities of TDs in university learning

Most of the collaborators consider that TDs favour learning and complement university teaching: "*I have learned [...] by watching videos on YouTube*" (Ianire, Pedagogy) and "*On many occasions, I have learned more by watching tutorials or things on YouTube than in class*" (Lluís, Geology and Fine Arts). Moreover, TDs allow them to learn directly from professionals outside their university: "*In Nursing, there are many useful Instagram accounts with health content uploaded by nurses, doctors, pharmacists*" (Amaia, Nursing). They use TDs at any time of the day and as often as they need to . For example, they highlight videos: "*While I was preparing dinner, I put on a couple of YouTube videos of my ophthalmology teachers. [...] They are 3 or 10 minute videos which is not the same as a 45 minute class*" (Anna, Medicine).

They take notes on the computer or tablet and share documents among students or with teachers (exams, notes, articles...): "*at university the computer is where I do everything, it's where I take notes*" (Irene, History and Political Science). They use WhatsApp to coordinate group work and notices of interest for the whole class, Google Drive to carry out collaborative work and email for contact with the teacher: "*All the classes are organised in WhatsApp groups*" (Lluís, Geology and Fine Arts). Also, although it is not usual, they highlight learning based on games: "*A great passion, video games*" (Àlex, Computer Engineering).

For the collaborators, the TDs facilitate quick access to information: "*I use the TDs to learn or find out more about something*" (Maitane, Primary education). They facilitate the communicative interaction of the university community: "*I tend to study alone, but I*

connect via WhatsApp with friends to solve doubts. In that sense, I don't study alone at all" (Yaiza, Computer Engineering). They also favour the approach to content from multiple perspectives and the creation of flexible and enriched learning environments: "*I use social and personal networks quite a lot [...] you see wonderful things on Instagram. It helps inspire you*" (Pau, Architecture).

As a result of confinement, there is a before and an after in relation to the use of TDs. For example, practically everyone now takes notes on the computer. They value positively the teaching staff who use TDs to promote learning: "*My teachers have adapted very well to this situation and we have done things that, perhaps, in the classroom, we would not have done. I've been reading a lot of articles and I'm very happy*" (Leo, Orchestra Conducting). Also, they give their opinion on online classes: "*I am aware that many of my colleagues don't like online classes. Quite a few of them don't attend lessons regularly. They use the recordings to watch them at any time of the day*" (Aleix, Physiotherapy). In general, they emphasise that there is a change in the way we learn today: "*Internet and technology in general has changed the lives of teachers and students. It has also changed the method of teaching. [...] I value the large number of resources that exist and their usefulness*" (Jordi, Law).

Weaknesses of TDs in university learning

During the COVID-19 pandemic, most institutions emphasised the continuity of classes in virtual format. Sometimes these virtual classes consisted essentially of presentations located on the virtual campus with asynchronous interactions. Our collaborators point to the lack of teacher training and of bidirectionality or teacher-student interaction: "*It is difficult for teachers to come up with a good way of teaching face-to-face. Well, imagine teaching through a screen without being professionals or being trained for it. It can't be quality training*" (Mireia, Classical and contemporary music).

Generally, students and teachers had to face this change unprepared. Classes continued to be taught digitally, usually without the necessary training and sometimes without the necessary resources: "*Virtuality had its pros and cons. Many of us didn't know how to manage it and the teachers themselves had problems organising the same syllabus*" (Lluís, Geology and Fine Arts). It also led to a feeling of less learning: "*When Covid started, it was already a let-down because the online aspect did not motivate me. I felt that I wasn't learning, even though I passed the subjects*" (Kareem, Graphic Design). In addition, it was harder to concentrate: "*It's harder to stay focused in online classes. [It takes more effort and work outside of class*" (Sabrina, Biology). Sometimes the problem was the availability of the necessary conditions and resources: "*It's terrible, because you lose the thread. You don't get it right, sometimes you lose the connection [...] it doesn't depend on you*" (Maitane, Primary education).

In the face-to-face classes that were recorded and/or where notes were available, there were quite a few students who were in class, but disconnected and used their time for other activities (for example, accessing social networks or playing games): "*In the*

face-to-face classes, the students had their computers and opened them to, theoretically, take notes [...] but practically all of them were on the Internet" (Jordi, Derecho). They mainly disconnected when the teacher was not a good communicator, did not facilitate learning in the classroom or the subject matter and/or methodology did not challenge them: "*They disconnected out of inertia, if it wasn't interesting. [...] I have watched entire series in class. [...] They capture your attention because it interests you or because it will be in the exam*" (Àlex, Computer Engineering). They value the active role of the teaching staff: "*I preferred virtual teaching proposals that were not passive, like a teacher talking [...] important when it comes to learning to have an active role*" (Irene, History and Political Science). They also predict that attendance in face-to-face classes will decrease because in too many cases they do not make sense of them: "*giving notes jeopardises class attendance a little, so that people relax and say that I already have notes for this subject and I'm not going to go*" (Medea, Restoration).

However, many of them value face-to-face teaching because of the non-verbal language: "*It is important to facilitate learning, the movements of the bodies, that the teachers move, walk around the room, gesture*..." (Antonia, Psychology). Thus, they emphasise the link with the teaching staff: "*It is not the same as having express something in front of you, that you can gesticulate, raise your intonation... A more intimate link is created. Through the screen, this intimacy does not exist*" (Júlia, Political Science). They also point to the climate created in the classroom, the result of accompaniment, affection and face-to-face classes: "*In face-to-face classes, the figure of the teacher is important [...] it's the gestures, the way they act, how they speak to you, how they address you*" (Mireia, Classical and contemporary music). In addition, they add the importance of the face-to-face space, the desire to learn on the part of everyone and a taste for the teaching profession.

Mobile phones are seen as an aid to learning, but there are different problems with them. For example, some use it to listen to music while preparing for exams, but at the same time they recognise that it sometimes distracts them: "*Usually, the mobile phone doesn't help. It's a distraction tool where your finger goes to WhatsApp or Instagram. Sometimes, I give it to a friend so as not to be tempted to open it*" (Aleix, Physiotherapy). At the same time, they value social networks as a source of learning, but also as a source of distraction: "*Instagram is another learning tool, but it is double-edged because it both helps you and distracts you when you are bored in class*" (Pau, Architecture). However, the possibility of distraction is not only focused on mobiles and social networks.

Discussion and Conclusions

University students live in an analogue and virtual universe. Their world is populated by mobile phones, laptops and other devices that involve digital overflow. They regularly use phones and mobile devices for communication and information retrieval. However, the continuous interference also causes them various problems. For example, Li et al. (2020) provide evidence of how mobile phone addiction is strongly

related to anxiety, depression, impulsivity and sleep quality. Salcines-Talledo et al. (2022) argue for the need to promote critical, responsible and adjusted mobile device use.

The main interests of university students are the consumption of social networks, obtaining information and leisure, above academic and university purposes (González-Limón et al., 2022). In this sense, Guerra-Santana et al. (2021) argue that the use of the Internet and social networks among university students has an impact on their lifestyles and learning processes.

University students value the need for a healthy use of TDs. They are concerned about the dependence they have, the power of distraction they cause and the difficulty of concentration they generate. In this sense, they highlight the syndrome of wanting to escape from the analogue context to navigate the virtual one (Sancho, 2021) or wanting to spend as much time as possible in the virtual universe for fear of feeling excluded (Dogan, 2019). However, they do not seem to be fully aware of the profound impact of using TDs. Thus, it is important to be educated about it. For example, Selwyn (2021) highlights environmental issues or the observations made by large technology companies concerning data privacy, surveillance, commercial influence and the like.

DTs are very present in the lives of students and are becoming powerful media where misinformation and fake news exist (Gómez-Galán et al., 2021) and are often based on powerful persuasive technologies (Peirano, 2019). In this context, digital literacy and especially media literacy, from a critical perspective, constitute a major challenge for education systems. Furthermore, we highlight the need to continue exploring both the possible and the desirable place of DT in teaching and learning contexts (Marín and Castañeda, 2022), without forgetting their collateral effects, nor the growing incursion of big technology in the field of education.

University students use digital resources regularly in their personal and social lives. According to Marcelo and Rijo (2019), they could also be used for learning at university. However, their use depends on the conceptions that institutions and teaching staff have about the meaning of education, and about the notion of knowledge and the way of teaching and learning. The majority of students consider that TDs favour university teaching and learning. While authors such as Arias-Aranda (2023) argue that, increasingly, it is cyberspace that traps and rules the lives of many students, provoking an anti-university stance. Thus, as a major problem, students may lose fundamental university knowledge and interest in acquiring it because their interest is shifting towards entertainment and pastime.

In universities, TD can be used from visions of meaningful, student-centred teaching and learning to favour alternative pedagogical proposals to traditional ones such as the inverted classroom and gamification (González-Limón et al., 2022; Pozo-Sánchez et al., 2022), or so-called continuous or seamless learning (Downes, 2017). However, TDs by themselves do not lead to the transition towards learner-centred pedagogical

approaches or towards autonomous, active, social and critical learning processes that involve and affect (Salcines-Talledo et al., 2022).

During the COVID-19 pandemic, most universities quickly moved from face-to-face to virtual mode. In general, it was a technological and not a pedagogical solution (Henríquez et al., 2022). The accompaniment and care during the learning process was not prioritised as an emotional experience. TDs were little used to favour learning and collaboration. Digital tools exposed inequalities in digital access (Sawchuk and Samuels, 2020). Some students had negative experiences of having to connect from familiar environments that were not conducive to digital distance learning (Killian, 2020) and other students showed varying levels of psychological distress (Arënliu and Bërxulli, 2020). Teachers focused on teaching via DTs without reflecting on the consequences of use (Adams et al., 2021). Thus, TDs were omnipresent and imposed their logics (Hernández-Hernández and Sancho-Gil, 2021). In many situations, students felt that they were learning little and wasting their time. Then, they already wondered whether attendance would decrease. Above all, if they no longer find meaning in the classes and no longer manage to meet their interests and/or expectations.

The educational transformation of the university was already a challenge before the pandemic (Miño-Puigcercós et al., 2019). Today, this need has amplified and intensified. For example, as Rivas Flores points out, teachers feel increasingly pressured to rethink their role as content providers in order to become companions, co-constructors and dynamisers of the knowledge shared with students (López, 2022). Thus, the university faces the challenge of moving towards more collaborative and student-centred models (Pérez-López et al., 2021). Also, the challenge of assuming the development of critical digital competence of teaching staff and students (Domingo-Coscollola et al., 2020; Sáiz-Manzanares et al., 2022; Viñoles-Cosentino et al., 2022). Moreover, recently, there is a need to analyse the implications of Artificial Intelligence in educational practice and how to use it (Giró-Gràcia and Sancho-Gil, 2022; Liu et al., 2023).

Finally, one of the main limitations of this article, although it is also the basis of its interest, lies in the fact that it focuses only on the assessment and experience of students. These voices could be broadened and enriched with the vision of other agents involved, such as teachers. In addition, it would be relevant to have the participation of a broader sample with contributions from other Autonomous Communities. It would also be advisable to promote research into the responsible, constructive and critical use of TDs, thus avoiding their invasive and omnipresent use.

It is important to be aware of the impact of digital devices and open media on the lives of university students and faculty. It seems appropriate for the university to rethink the dimensions of teaching and learning, and the notion of knowledge considering the critical vision of digital and media literacy. Also, what is the role of ICT in teaching practice and in teacher training, stressing the importance of critical, safe and responsible use. Because as Lawrence Stenhouse used to say: *"No one can put someone*

else's ideas into practice". The university context needs an educational transformation to achieve a more inclusive, participatory and humane university where learning and education are meaningful and responsible.

Funding

- Ministry of Science and Innovation, PID2019-108696RB-I00.
- REUNI+D. University Network for Educational Research and Innovation. Connecting Networks and Promoting Open Knowledge (MCIU, RED2018-102439-T).
- UB ESBRINA research group (2021 SGR 00686).
- VINCLES research group of the UIC (2021 SGR 01246).

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Date received: 27 October, 2023.
Review date: 15 November, 2023.
Date of acceptance: 4 June, 2024.