Virtual Master's Training: Implications for Teaching

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ABSTRACT

In recent years the demand for online postgraduate courses has grown significantly (MECD 2016; OCDE 2017)—as, concomitantly, has academic interest in analysing distance education teaching practices in order to optimise online students' learning. In this study we address this subject with a twofold objective: to identify the benefits and drawbacks of these virtual learning environments, and to outline prospective ways to improve the teaching and learning process in said environments. This study has been carried out in UNIBA (Centro Universitario Internacional de Barcelona), an affiliate institution of the Universidad de Barcelona (Spain) which offers five master's degrees and an undergraduate course. These programmes cover different fields of knowledge and have up to 1400 students from 25 different countries (principally in Europe and America) per academic year. In this paper we lay out the results of a qualitative study in which a content analysis (Cohen, Manion and Morrison 2007; Creswell 2012) was carried out on two types of data: students' access profiles (identification data, professional and educational background and students' reasons for enrolling in these programmes) and student and teacher satisfaction questionnaires.

The findings show, on the one hand, that overcoming space and time barriers is one of the main benefits of these online programmes, along with an enrichment of the interaction between teachers and students from different cultures and contexts. On the other hand, they show that some of the competences included in the Dublin Descriptors (2004) are difficult to achieve, a difficulty which represents an avenue for further research. One of the measures to be taken is the creation of online collaborative spaces which allow for the fruitful use of digital tools, and the promotion of simulated practices or problem-based learning, where learners' autonomy is encouraged.

Keywords: higher education, master's degree, distance education, online learning.

INTRODUCTION

With the growth in the number of students looking to do online master's courses comes the need to study the processes of virtual teaching-learning using a theoretical framework which is "capable of guiding and orienting not only the analytical and explanatory approaches to such processes but also the tasks of design and evaluation of environments, materials and proposals for virtual teaching and learning."[2] (Onrubia 2016, 2). Such an approach would be of considerable help in confronting several recurring problems in this field, such as those highlighted by Onrubia (2016):

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[2] All translations of texts/quotes originally in Spanish carried out by or on behalf of the authors of the present study.

> A lack of recognition, and insufficient contemplation, of the complexity of the relationship between new information and communication technologies (ICT) and educational practices, assuming a simplistic and linear vision which claims that the incorporation of ICT in such practices constitutes, in itself and necessarily, an improvement in terms of their quality (…), and the fact that discussions surrounding the incorporation of ICT in the processes of teaching and learning focus more on the technological aspects than on those related to education. (2)

As such, and in agreement with Onrubia (2016), it is necessary to begin with a process of reflection, and with an adequate conceptual foundation. To these will then be added a greater number of empirical studies which will help us to elucidate what teacher strategies turn out to be the most appropriate and effective in improving educational practices in virtual environments and, ultimately, in making students' learning more meaningful (Hernández, Fernández and Pulido 2018).

Since the declaration and acceptance of the Bologna Process in 1999, the European university system has undergone a wide range of changes. After almost twenty years of transformation, it is vital to reflect on what has been happening in order to continue looking towards that which is to come (Rodríguez 2018; Vázquez 2015). One of these changes— linked to digitalisation—has been the emergence of virtual training programs in higher education (Michavila et al. 2018) which have brought with them a new training framework for the university as an institution (Bermúdez et al. 2017; Cabero and Román 2004).

The emergence of these virtual courses has been diverse; they have gained ground in traditional face-to-face university settings and have also been developed autonomously and directly as virtual universities, that is, not as offshoots of these face-to-face versions (Sáez, Domínguez and Mendoza 2014). The case presented here will be that of a traditional university which has created a virtual space, managed independently with the same basic elements as the traditional university, where, generally speaking, the teaching staff is also the same (García and García 2002; Sangrà 2001).

Systems of teaching must address social, economic and technological changes. Each era has had its own educational institutions, adapting educational processes to the circumstances faced. Currently, the changes which affect educational institutions are creating a new context in which the omnipresence of telecommunications in society, the need to prepare professionals for times of change, and the constant retraining of these professionals to keep them up-to-date, demand not only new teaching-learning methods but also new, specially-developed theoretical models. One of the main contributions of ICT (in particular telematic

networks) to the field of education has been the opening up of a range of possibilities in training modalities which are relevant as much to distance learning as to the modalities of traditional classroom learning (Cardona 2002).

Online learning is on an upward trend all over the world, with online master's training being one of the types of training which have grown most in recent years (Hiltz and Turoff 2005; ICEF 2012). This space is today considered one of the fundamental tools in the implementation of the knowledge society, based on competency training for professional development (Figuera et al. 2018). Indeed, in absolute terms, it is the master's level which has seen the largest growth in the international university system (Hauschildt et al. 2015; OCDE 2017). Also, Spain is one of the European countries with the highest percentage of master's students; according to recent OCDE data (2017), 14.3% of the population between 25 and 64 have reached this level. Since its introduction, the amount of master's places offered has grown substantially and enrolment increased by a factor of 10 between the 2006-07 and 2015-16 courses (MECD 2016). In the 2016-17 course, 187,000 students enrolled in an official master's course, an increase of almost 4,000 in relation to the previous year. This increase is corroborated by the study published by the AQU (2017) with respect to the specific context of this paper.

This paper analyses competence training at this educational level, in terms of specific skills and transversal skills, requiring reflexive work on the part of the institution and the teaching staff involved. Training in transversal skills is yet to reach an adequate level. Although technical skills are the most necessary for the labour market, ethical and social responsibility, critical thinking, self-assessment, and self-directed learning, communication, and teamwork are also very important (AQU 2017). In the analysis of educational improvement, all of these (except theoretical training) need to be reinforced.

It must be ensured that in this new model of teaching—virtual education and in particular master's training—students acquire the skills required for their qualification level, and to ensure this, virtual institutions must consider technological media as a tool for social interaction and communication. The virtual nature of knowledge does not presuppose a lesser knowledge, nor a second-degree knowledge, but rather implies a transformation of the processes by means of which the world is learned and explained (Cardona 2002).

Cabero (2010) notes that ICT is a significant means for learning given that it allows the

promotion of universally accessible systems of education, thus allowing for an elevated level of educational quality for all and for a dialogue of knowledge. Furthermore, it allows for the expansion of opportunities for information gathering, the creation of more flexible learning spaces, the elimination of space and time barriers between the teacher and students, an increase in the number of communication methods available, and the enhancement of social interaction between participants. It also promotes the creation of new interactive environments, favours autonomous approaches to learning and collaborative, self-directed learning, offers new possibilities for student orientation and tutoring, and facilitates ongoing training.

It is undeniable that face-to-face education has a number of advantages which allow it to awaken in students a passion, enthusiasm, and optimism needed to actively want to learn, with the permanent support of a teacher who acts as a model and guide, and with the creation of productive environments for the development of workshops, talks, forums and other places in which ideas and knowledge can be exchanged. It is precisely in the absence of such a model or paradigm of behaviour, however, that distance, virtual learning finds its main strength: the fact that students are not presented with someone to imitate means that they must be and feel themselves as they really are and as they relate to the world (Cardona 2002). To give some clarificatory examples: there is a blurring of boundaries and distances, in that new media allow teaching in virtual education to overcome space and even time (Sevillano 2009); telematic networks allow for the extension of university studies to those social groups who, for a variety of reasons, cannot access face-to-face education (Area 2000); travel and accommodation costs can be avoided, minimising the time needed to complete tasks and guaranteeing access to most users (Quinn 2009); the internet allows and promotes collaboration between teachers and students beyond the physical and academic limits of the university to which they belong (Area 2000); in distance learning the course contents and learning materials are essential elements (Anastasiades 2010); and students are more self-sufficient, which creates new opportunities for those who cannot attend classes regularly (Gi-Zen and Gwo-Jen 2010). As noted by Darabi, Sikorski, and Harvey:

> Though face-to-face education still predominates today, distance education (DE) has become a viable alternative for those who are unable or unwilling to travel to campus yet still possess the desire to learn in a formal environment. Learners are now able to interact with instructors, peers, and course content in an environment that affords a number of the

benefits of traditional face-to-face interaction, without having to leave their home or office. (Darabi, Sikorski and Harvey 2006, 106)

Online learning is distinguished primarily by the fact that it takes an asynchronous approach in which the student learns at their own pace once the teacher has designed a learning environment in which all resources are made available, with messages on virtual forums, discussion groups and messages in the virtual environment. This can be refined using some synchronous communication tools which refer to virtual classes supported by programs such as Cisco Webex and Blackboard Collaborate, and through the use of interactive videoconference software (Sáez, Dominguez and Mendoza 2014).

Nevertheless, it is also important to consider the disadvantages of this approach to then mitigate them as far as possible. A specific administrative infrastructure is needed, with technical support staff and funding for the hiring of teams with the skills necessary to develop a fast, satisfactory training program (García et al. 2018). Aside from the issue of having such infrastructure and personnel, a significant problem arises in that the virtual learning environment is designed for individual use without recourse to any type of communicative interaction. This leads the student to feel isolated, and in turn disoriented, and ultimately to them developing a negative view of this approach to education. The communication tools used must promote real and effective interaction between the students and the teacher (Sáez, Domínguez and Mendoza 2014) and also between the students themselves, in order to address the issue of isolation. With respect to the interaction generated between teacher and students, a considerable number of students prefer the learning environment provided by a physical classroom, through which they can maintain contact with the teacher (Anastasiades 2010; Sáez 2012). The knowledge that one can converse and ask questions in person, with all the advantages concomitant to such personal contact, is a positive element in face-to-face teaching, and its value must be taken into account when considering virtual teaching environments.

Another problem presented by virtual training is the unthinking reproduction of traditional teaching methods. The proliferation of this type of training has often led to its implementation without an adequate understanding of how it differs from other types (Quinn 2009). This can result in the accumulation of content and materials on the virtual platform which fosters a teaching methodology based on simply exposing students to information, in which they become a mere passive recipient of information, with no activities or learning

tasks to foster their engagement.

In a virtual training context, the instruction approach is often learner-centred, since "the goal is not the transfer of information but to guide learners in their pursuit of knowledge" (Gibson-Harman, Rodriguez and Grant-Haworth 2002, cited in Darabi, Sikorski and Harvey 2006, 106-107). Authors such as Goodyear et al. (2001), note too, that much of the responsibility for learning falls upon the learners, with the instructor acting as a facilitator, as will be seen below.

As a relatively new approach in educational contexts, and as with all new developments related to technology, online learning is going through a slow evolution as a result of a resistance to change. Modes of communication, internet connection speeds and the effectiveness of resources are making progress, albeit slowly, and as such are removing obstacles related to interferences and technical problems resulting from the physical means of teaching.

As such, from all of this comes the need to carry out an exhaustive analysis of the teaching-learning process in virtual environments, a process indivisible from the actors involved in the process, the teacher and the student. This entails, therefore, carrying out an analysis of the profiles and the needs of the students in these environments, as well as an analysis of the competences of, and roles performed by, the teacher.

The teaching-learning process in virtual environments

The conception of virtual learning which will be taken as a foundation is that of Onrubia (2016, 3), who defines it as "a process of personal (re)construction of that content [which comes with the learning process] which is carried out in function of, and through, a wide variety of elements which make up the cognitive structure of the learner: basic cognitive abilities, domain-specific knowledge, learning strategies, metacognitive strategies and strategies of self-regulation, affective factors, motivations and goals, mutual representations and expectations". From this perspective, and with the objective of identifying possible ways to promote students' learning in virtual environments, two essential implications inherent to their learning process are developed: the structure and internal organization of the object of learning and the cognitive structure of the student, that is, the tools available to them in their attempts to relate themselves in a substantive and profound way with said object of learning (Onrubia 2016). As such, it is essential to bear in mind not only the design of the material object of learning in virtual settings but also the

pedagogical support necessary in tailoring the material to the student based on their own learning process. This support is essential to ensure the continuous and active monitoring of the learning process of the student, as and when required. It facilitates the student in "going beyond what his or her solitary interaction with the content would allow [him or her] to do" (Onrubia 2016, 5), in such a way that, in turn, the autonomy and self-regulation of the student in his or her learning process are promoted.

From this perspective, three fundamental elements that each play a part in teaching-learning processes are identified: the role of the student in the process; the pedagogical support provided by the teacher; and the object of learning. This study will focus on the assessments made by both students and teachers of those aspects that they consider positive and/or in need of improvement in the teaching-learning process in the virtual environment. However, it must be kept in mind that the educational context in which every teaching-learning process is framed determines its uniqueness and complexity. As such, it is necessary to contemplate not only the three elements outlined above—undoubtedly key factors in any educational context—but also the institutional context in which the process is situated, which also determines to a large extent how the process will develop.

The agents involved in the teaching-learning process in virtual environments
The student in virtual learning environments

The students who enrol in master's programs, and more specifically those involved in this study, are adults, and their status as such must be taken into account—specifically, those characteristics which differentiate them from other students, such as the fact that they are "autonomous students, with prior experience, orientated towards concrete goals" (Collins 1998, cited in Adell and Sales 1999, 7):

- As adults, their self-concept is not as dependent on the context; they make their own decisions and control the direction of their lives.
- They bring a wide range of experiences and knowledge which represent a valuable source of learning which no trainer can ignore or reject. This accumulated experience should be taken advantage of to enrich the learning of the whole group.
- Their motivation to learn is centred, above all, on the themes and activities which allow them to develop and improve the social roles which they play. As such, they are likely to have very specific expectations and needs concerning their training. Motivation is linked to their

satisfaction with their educational experience, which contributes to explain academic outcomes, graduation rates and possible dropouts (Wilkins et al. 2016). Furthermore, understanding the student's expectations of the training will be vital in being able to provide them with an instruction which meet their needs and increase their levels of satisfaction (Hernández, Fernández and Pulido 2018).

- Given that their objectives with respect to their training are fundamentally centred around specific concerns related to their professional development, they value their learning based on its immediate applicability, and for this reason, they are oriented more towards the resolution of problems than to the theoretical exploration of topics.

One of the roles of a teacher is to foster the autonomy and self-sufficiency of students and to promote the joint construction of knowledge. The points mentioned above should be kept in mind when considering that role. For this reason, collective work and cooperative learning represent sound strategies, because they favour "democracy, group solidarity and autonomy in one's own learning" (Adell and Sales 1999, 7). Darabi, Sikorski, and Harvey (2006, 106), however, note that "there is also a quasi-permanent absence of a learning group where the focus is teaching to individual learners rather than groups (Holmberg 1995; Keegan 2002)."

In addition to this, and as a common denominator between all types of teaching in all environments, students' diverse motivations, interests, needs, and abilities must be considered. As noted by Adell and Sales (1999, 7), "this heterogeneity is positive and enriching if the trainer knows how to take advantage of it and use it to benefit the group, but it can be a damaging element if the didactic work does not take it into account."

As mentioned above, one of the advantages of teaching in virtual environments is the ability to overcome space and time barriers, and in programs such as that on which we are focussing, the adult students are looking for a flexibility and a freedom which, in many cases, allow them to combine their studies with work and familial obligations. This is not incompatible with the need for collaboration on the part of their fellow students nor with the establishment of social relationships. As highlighted by Adell and Sales (1999, 7-8), citing Paulsen (1992), "we need to combine freedom and the necessity of sharing in a real educational program which is flexible and, at the same time, cooperative." To expand this line of thought from Paulsen 1992 (cited in Adell and Sales 1999, 8), the flexibility of the

system refers to six dimensions—time, space, rhythm, setting, access, and curriculum—and the degree of flexibility of these elements and the process as a whole depends, in large part, on the relationship which is established between the teacher, the students and the course contents, corners of the essential triangle to which reference was made earlier. The relationship between these elements is articulated through the teaching-learning activities utilised.

A wide range of studies highlights the fact that learning processes improve with meaningful activities related to problem-solving (Escudero 1989, Evensen and Hmelo 2000), concretely through a process called 'learning by doing' (Schank et al. 1994), in which the focus is on the learner's own learning process. As noted by Adell and Sales (1999), "those students who perceive their learning as being the result of their own activity have a higher likelihood of succeeding and of finishing their studies than those who feel that control resides outside of themselves, who depend on luck, the system, the arbitrariness of the teacher or on circumstances outside of their control" (5-6). This is influenced, therefore, by the confidence that students have in their ICT skills, as those who feel less comfortable with such skills have a higher risk of dropping out or losing motivation than those who use them habitually. As such, training students in the use of new media and audio-visual communication languages are vital (García et al. 2018).

The teacher in virtual learning environments

Although it might seem reasonable to expect the growth of online learning to reduce the costs associated with employing teachers, demand for online training is growing exponentially along with the need for teaching staff to teach these courses (Goodyear et al. 2001):

> Online learning and teaching should be understood against a background of globalization and "borderless education." Major corporations and virtual universities seek to operate in a global context. Consequently, definitions of the competences involved in effective online teaching need to be expressed in a way that minimizes problems of understanding and interpretation across national, linguistic and cultural boundaries. (67)

This aspiration towards internationalising the programs and the different interpretations that can be given in these globalised contexts brings with it a series of risks which also affect, often as much as the content itself, the understanding of the students with respect to the different elements of the program. Substantial differences can be seen, for example, in the syllabus of a Psychology and Education program in Spain and a Psychology and Education

program in Italy, and the evaluation system in Latin American countries or the United States and Spain. The same can be said regarding the overall learning culture associated with the Spanish educational system and those of the students who are based elsewhere.

The teacher and his or her role in this virtual learning environment are two elements subject to distinct analyses. As mentioned above, said role must not be centred solely on the transmission of information—rather, it must involve tutoring, orienting and keeping open a relationship (or relationships) of communication and collaboration which avoids the isolation of the student, in order to promote a proactive learning process (Sáez, Domínguez and Mendoza 2014). The interaction between the process and the student is essential since it influences and determines the effectiveness and success of virtual programs. In online teaching programs, communication is achieved in two ways: firstly, unidirectionally between the student and the learning material; and secondly, bidirectionally between the student and the teacher (Anastasiades 2010).

Teachers, above all in the virtual environment, must adapt to this new context, as well as to new forms of interaction with students. The demands placed on the teaching staff will stem from the need for them to respond to the students (and their speed in doing so), the form and diversity of these responses (warmth of tone, understanding) and their adaptation to the rhythms of each student (due to the personalised training which they demand) (Nicol 2010; Pereda 2016; Sánchez, Olmos and García-Peñalvo 2017). These are all elements to be considered in the teaching-learning process.

We must try to create new frameworks of learning and not reproduce the traditional ones, a process which will necessarily involve the transformation of the roles of the teacher and the student. The teacher must move from being someone who simply transmits information to instead being the designer of mediated learning environments, while the students move from being passive recipients of information to active participants in the process of knowledge construction.

Given all the above, the following requirements can be outlined:

- Management of fundamental change in the field of higher education through a systemic and transformative approach, which contributes to economic growth, human development, and social cohesion.

- Teacher training in the use of digital media in teaching and learning processes—that is, digital literacy as an essential aptitude of the teaching profession so that technology can be used to its full potential in promoting the construction of knowledge (García et al. 2018).

For instance, the virtual instructor must manage the complex logistical elements involved in the implementation of new technology, such as Web-based discussion, Web-based video conference, Web-based chat, email, etc., and satellite technology (e.g., videoteletraining) (Darabi, Sikorski and Harvey 2006, 106-107). "While guiding the Learners in their self-directed pursuits of knowledge, the instructor's management of these technologies underlines the significance of the DE instructor's competencies and the performance tasks that represent those competencies" (Darabi, Sikorski and Harvey 2006, 107).

Competences and roles of the teacher in virtual learning environments

Virtual teaching-learning processes are determined by a series of inherent factors, such as those related to the characteristics of the technological resources available to the virtual environment and its pedagogical focus. Firstly, regarding technological resources, authors such as Onrubia (2016, 7) determine the following factors to be 'crucial' in the organization and development of joint activity between teachers and students, facilitating or complicating it: the inclusion or not in the environment of collaborative work tools, of asynchronous and synchronous communication, and of evaluation of learning of different types, as well as the possibility that the teacher has to adapt and personalize these tools. However, while these factors condition the joint activity between teachers and students, they do not completely determine it. As Onrubia (2016) goes on to say, these teaching-learning environments may make use of tools designed for different purposes which the participants then do not use effectively, or, conversely, participants may complete certain activities using technological tools which they can employ with ease, even though this approach was not foreseen in the design of the activities. All of this will depend on a range of factors, such as the knowledge and ability of the teachers with respect to the use of these tools (and that of the students, as mentioned above), the nature of these tools, the technological support that all parties receive from the companies which supply the tools used, and to what extent the institution promotes their use.

In some instances of virtual teaching, the conception of the role of the teacher is that of providing a reduced level of support. From a constructivist conception of teaching and

learning (Coll 1996; Onrubia 2016), however, the technological tools relied upon by virtual learning environments are not an end in themselves but rather a means to facilitate the pedagogical support which will enable a meaningful learning experience for the student. Such a process is not determined by the use of ICT but by the form of interaction promoted and provided by the teacher.

Other studies, such as that carried out by Goodyear et al. (2001), highlight the most important aspects of virtual learning environments as being the roles of teachers and their importance in the learning process, and the use of a competence-based approach (as opposed to humanistic and cognitive perspectives). In terms of roles performed, the authors point to the following as inherent in online teaching (Goodyear et al. 2001, 67-69): content facilitator; technologist; designer; manager / administrator; process facilitator; adviser / counsellor; assessor; researcher (related to the study of teaching, not with the conception of primary research).

Additionally, Goodyear et al. (2001, 70) carried out a work session in which they compiled a preliminary list of the competences related to online teaching, subject to an eventual discussion and analysis to redefine and validate them. These competences were not specific to the teaching-learning process in virtual learning environments, and subsequent work was necessary to determine whether they were relevant to all forms of virtual teaching, or whether instead, they were dominant only in certain sectors or cultures.

Nevertheless, in a later article, Darabi, Sikorski, and Harvey (2006) present the following:

> Even though some may think that instructor competencies do not differ significantly between face-to-face and DE [distance education], our article sides with Perraton, Creed and Robinson (2002) who contend that the instructor's removal from the learner in terms of space or time presents unique requirements for effectively managing both the pedagogical and the logistical elements of instruction. These pedagogical elements include motivating students, promoting relevant learning, facilitating access to course content, engaging the learner in activities and discussions through communication, monitoring learners' progress, and adjusting learning opportunities to support learners in areas of difficulty (Gibson-Harman, Rodriguez and Grant-Haworth 2002; Herrington and Oliver 2001; Holmberg, 1995; Schrum and Hong 2002; Wiesenberg and Hutton 2000). (106)

The online instructor competencies, drafted by these authors by conducting a review of the literature, can be seen in Figure 1 (cited from Darabi, Sikorski and Harvey 2006, 110).

According to Darabi, Sikorski, and Harvey (2006), interaction remains a predominant

feature of an effective teaching-learning process in online education, just as much as in traditional education. The results of their study show that the tasks related to interaction are evaluated as being among those which are carried out most frequently and which take up the most of the teacher's time. In this respect, it is worth noting that such interaction is not limited to direct interaction of the teacher with students but also considers the facilitation and promotion of interaction among the students and between the students and the contents of the course. The results also show that when this competence (employing appropriate types of interaction) is adequately developed, interaction with students "is said to set the tone for the entire course and elicit optimal responsiveness from learners (Palloff and Pratt 2001; Salmon 2000; Schrum and Hong 2002)" (Darabi, Sikorski and Harvey 2006, 115).

In short, as pointed out by Adell and Sales (1999, 5), "the question, then, is not where the student and teacher are located or how they communicate, but the quantity and quality of their interaction."

METHODOLOGY

This study presents the results of a qualitative diagnostic study based on the application of an open questionnaire as a method of collecting data from the students and teaching staff of online master's course. What follows is an exploration of the competences and strategies that teachers must apply to the teaching process in virtual learning environments, and an analysis of the assessment that students and teachers make of this process. Therefore, the work has a twofold objective: a) to identify the benefits and drawbacks of virtual learning environments and, b) to outline prospective ways to improve the teaching and learning process.

Context and participants

The population of this study is constituted by the students and teachers of the official master's degrees of the Centro Universitario Internacional de Barcelona (UNIBA), in Spain. This institution is an affiliate of the University of Barcelona (UB), created with the aim of offering a wide range of undergraduate degrees and official master's degrees with a clear commitment to innovation and quality and with a marked international vocation. Its methodology allows students to train with total flexibility, without the need to travel or adapt to fixed schedules, thanks to the intensive use of new information and communication technologies (ICT). In addition, all students benefit from personalised attention, in the form of a continuous evaluation system and the permanent support of a teacher, personal tutors for their final theses (and for internships in some programs) and the

figure of the *program manager*, who supports and guides them in terms of their relationship with the organization, and who is part of the organizational system of UNIBA, with a role centred around specifically this type of student attention. On top of this, each program features a teacher-coordinator, who monitors the quality of the proposed course contents and the coordination of the teaching staff, and the program director, who ensures, in a supervisory role, the correct functioning of the training in relation to equivalent face-to-face programs. Finally, there is also an academic management coordinator, a secretarial department, program admissions advisors and the centre's academic director.

For this research, four of the six training programs have been selected. These correspond to three knowledge areas within higher education: social sciences (Master's Degree in Psychology and Education); humanities (Master's Degree in Advanced Studies in Spanish and Latin American Literature, and Master's Degree in Spatial Planning and Environmental Management); and experimental sciences (Master's Degree in Renewable and Sustainable Energy). The final sample is made up of 406 students drawn from a total of 442 who matriculated in Iteration 1710 (October 2017) of these four courses (see Table 1). The selected programs have 60 ECTS, run for two semesters, begin and end at the same time, and run twice each academic year, once in April and once in October. Furthermore, to ensure that students have a positive experience, some complementary training subjects are provided with the aim of bringing the knowledge base of the students up to the required level.

The profile of these students has been studied through a combination of sociodemographic variables (age, sex, relevant previous experience, work status, financial support status, or family situation) (see Table 2). A majority are women, with an average age of 37, have work experience related to what they are studying, are financing their studies themselves, and live independently with dependent children.

In addition, teachers were given the chance to make their voice heard through a separate questionnaire. These teachers are mostly women (although this differs by master's degree, Renewable and Sustainable Energy having a majority of men teaching), with an average of fifteen years' experience in university teaching (less in terms of training in virtual environments) and an average age of 40 (see Table 3).

Data collection instrument

Before explaining in detail the two open questionnaires used, it is important to note that these have been created with a number of dimensions in mind, dimensions considered essential for evaluating the quality of virtual education. An adaptation of these dimensions was made based on the classification provided by Marciniak and Gairín (2018) and Sáez, Domínguez, and Mendoza (2014):

- Institutional context (analysis of training needs, infrastructure, human resources, financial situation) and technological infrastructure (factors regarding technological and organisational problems).
- Students (role of the teacher in online training, factors which influence student satisfaction). The factor of analysis is the autonomy and interaction generated between all parties involved in the process.
- Teachers (student profiles and factors which influence their satisfaction). They carry out a self-assessment regarding their pedagogical performance and their specific competences (evaluation of the contents and preference for different types of activities in the platform), and of their transversal competences, based on how they approach their work as teachers.

The questionnaire given to teachers is composed of five questions using the Likert Scale—which go from a single item up to six—graded between 1 and 10 (from lowest to highest level of satisfaction) and an open question. That given to students is composed of two questions using the Likert Scale—from three and four items—graded between 1 and 10 (from lowest to highest level of satisfaction) and two open questions (see Table 4). The questionnaires were sent directly from the platform to their recipients (via the program Survey Monkey) when they finished each subject.

Research process and analysis methodology

Content analysis (Creswell 2012; Cohen, Manion and Morrison 2007) has been carried out on the information supplied by the students and teachers. In order to make best use of the amount of information extracted, the decision was made to select, from the set of surveys carried out in the four masters', those corresponding to the two subjects most highly rated by the students (based on general satisfaction data) and those of the two lowest-rated subjects in order to make a comparative study of those elements which work and those which should be reviewed, and an analysis of the full set of answers given by the students who participated in the four selected subjects of each

master's, therefore, a total of sixteen subjects. With the assessment given by the teachers, on account of the lower participation sample (49 people) the decision has been made to analyse the full set of answers together.

Using the data collected, each researcher carried out a separate analysis, codifying this in line with the dimensions agreed together beforehand. Once the data were codified, the researchers met for a joint work session in which they discussed the results related to each dimension. In this process, they also agreed on the specific indicators of the three dimensions analysed (taking into account the initial classification) which are presented in the following Figure 2:

Subsequently, a joint analysis was carried out on the responses of both teachers and students. This was done in relation to the predetermined analysis dimensions (a macro level analysis) and also through looking at a range of specific responses, in relation to the characteristics of UNIBA training specifically (a micro level analysis).

A summary of the agreed codes for each questionnaire is presented below. The analysis will focus on the teaching-learning process within these programs in a holistic sense, and not based on the particular nature of each subject. As such, giving individual codes will allow the voice of each participant group to come through without using their specific names. This is the codification of the open questionnaires: Advanced Studies in Spanish and Latin American Literature: SLIT1-SLIT61 (Students) and TLIT1 – TLIT7 (Teachers); Renewable and Sustainable Energy: SRSE1 – SRSE94 (Students) and TRSE1 – TRSE9 (Teachers); Spatial Planning and Environmental Management: SSPEM1 – SSPEM93 (Students) and TSPEM1 - TSPEM20 (Teachers); Psychology and Education: SPE1 - SPE158 (Students) and TPE1 – TPE13 (Teachers).

RESULTS

Now we turn to the results of the surveys, presented based on the dimensions explained above; first, those issued by the students and then those of the teachers. The most commonly occurring issues are highlighted in bold (see Table 5).

Student Surveys

Concerning the institutional context, the participants noted the positive side of the virtual training provided, in that flexibility regarding time management allows for the participation of those who have other responsibilities (work and/or family). Furthermore, the multidisciplinary and

international nature of the courses helped overcome space and time barriers. They noted, also, that:

> Due to working and having a family I don't have time to attend face-to-face classes, but was keen to continue receiving training, and doing so virtually has been a good decision. I organise my time in a way that works for me, and always receive support and guidance from UNIBA (SPE19).

> I was interested in studying with UNIBA because the training is certified by a prestigious institution like the University of Barcelona. This gave me a certain degree of peace of mind (SSPEM33).

On the other hand, they also raised issues related to the training which require further reflection to ensure the continuous improvement of programs and their management by the institution. Some of the challenges include; the improvement of technical conditions (platform, videoconferences, etc.); the review of the processes of admission; enrolment of students in student databases; and the administrative management of virtual classrooms. This group of concerns was one of the most commonly mentioned:

> [There needs to be] higher quality in videoconferences; there were always problems with the audio and video, and with other aspects of the platform (SSPEM14). [It was] decidedly so-so—it was a pity how poorly the resources were used, as the presentation could not be seen in its entirety, with almost 40% of the time being used up trying to resolve technical problems and glitches (SPE44).

> I think the way groups are integrated into the virtual classroom should be improved. They allocate us to two distinct groups in the platform, for the same course. It's a mess (SPE78).

Another of the most commonly occurring aspects (and therefore another objective to be achieved) is the adaptation of the training to the variety of student access profiles (age, years of experience, educational background, educational culture of their country of origin, etc.), also taking into account geographical location:

> [There should be] a clear policy for setting the times of the videoconferences (taking into account the scheduling concerns of all students) (SRSE85)

> It was a difficult subject, given that I am a lawyer [i.e. working in a significantly different field], but nevertheless I think I learned many new things. The activities weren't easy, but as I say, I learned a lot. (SSPEM25). For many of us who are not familiar with the topic, we needed to fill in any gaps with other readings (SRSE58).

On this basis, the institution must move towards congruence between learner access profiles, the master's title (the subjects and content), time management (time allocated to each subject and the hand-ins of assessed activities) and better training for teachers in the use of the virtual platform. All of these are linked to the preparation of the virtual environment

through the combination and organisation of the contents, and the support of the teacher. Some of the most representative statements from the students:

> Optional course [should be] made mandatory (SSPEM2). Revise access to information added to the platform. (SLIT1).

> [There should be a] training course for adaptation to the platform for the teaching staff (SRSE8). My suggestion would be that the university trains their teachers and ensures that they are well-informed regarding the implications of virtual training (SLIT6).

The **students** highlighted how highly they valued interaction with their fellow learners, whether in group work set by the teachers or in taking advantage of the wealth of opportunities for cross-context learning in more informal contexts (subject-specific discussion boards or WhatsApp groups):

> Interaction with classmates from different countries, discussion spaces and projects for learning […] is much more enriching (SLIT34).

> As this is an international and multidisciplinary master's, the interactive forums allow students a more global account of each debate or topic. In my view, it's a thorough, interesting and dynamic learning method (SSPEM28). Forum participation, directed by the teacher, should be utilised much more, as it's very important to take advantage of the interaction in these spaces, under such direction (SRSE5).

Group work is a controversial topic. Although many comments were very positive, at the same time there were a considerable number of dissenting voices, with a variety of criticisms. The most common of these related to the evaluation of group work and the lack of responsibility taken by some members:

> Assigning 50% of the overall grade based on group work is too high. I am not against group work. To the contrary, I like it, and in fact, my team and I worked well. Nevertheless, I believe that having 50% of the subjects depend on the activity of other people when in the end the mark is individual is not fair (SSPEM27).

> I didn't like the group work… My group was excellent, the members very intelligent, but with group projects the problem is never the material, it's communication. We're all smart, but it's difficult to communicate my ideas to 5 other people who are working separately. I know it's important to develop the ability to work with others, but this isn't what I chose UNIBA for. I chose UNIBA to be able to learn while also doing two jobs (SLIT1).

Another thing to be learned from these settings is competence in self-directed learning, given that time management with respect to their own pace and to that of the subject allows them to develop autonomy at the same time:

> Self-study and personal research are positive aspects of this training program (SPE37). Being able to work alone and to reflect without the pressure of a group has helped me a lot (SLIT42).

The students' own perception of their access profiles and the relationship between the time they have available and the demands of the program were also recurrent themes. Many of them work, have familial responsibilities, and live in different parts of the world, and as such they ask, among other things, that differing time zones be considered when setting activities and videoconferences:

> [They should] give more accurate estimations of the time needed to carry out tasks, given that doing them correctly requires a great deal of time and dedication. I believe that holiday time should be taken into consideration, because we had very little time for the last activity, and it fell during the Christmas period when many of us were not at home (SLIT14).

The reflection the students make regarding the relevance of their experience before starting the course, as much in a positive as in a negative sense, is interesting. Many of them say that, despite having met the entry requirements, they do not feel prepared for certain subjects they need to do. This explains why they are so demanding with respect to the technical training required by such subjects. This is a frequent demand faced by the teaching staff:

> Being able to draw on my professional experience in the tasks set has helped me a lot (SSPEM52), (listed as something which aided them in doing the master's, specifically in relation to student access profiles.)

> Personally, I had no knowledge of the topic. It seemed that some students already had knowledge to draw on, that they were already familiar with the concepts (SLIT41). They should understand that they have many students who are not psychologists and who, therefore, cannot interpret a case study no matter how much they give us to read. In fact, they give us so much to read that it isn't possible to get through it all. What's missing are practical examples on which we can, for example, base our final reports. To sum up: not so much theory and more practical material, real situations and problems which widen our understanding [should be provided]. Also, it must be taken into account that we are often asked for 'some things' that we don't know as we don't have the prior preparation (SPE121).

Here it is worth noting the demand made by the students for a tailored learning experience, which can be seen in a range of comments, for instance:

> Although consultation and self-directed learning are fundamental in virtual settings and distance learning, it's important to recognise strengths and weaknesses which result from the professional disciplines of the students and to grade activities with these in mind (SSPEM11).

On the other hand, a minority of students stat that their fellow learners should be more self-critical, make more of an effort in their studies and not be so demanding with the teaching

staff:

> [There should be] more self-criticism and effort on the part of the student (SSPEM90).

When considering the **teaching staff**, students highlight elements linked to the expertise of the teacher in knowledge management in relation to those elements which facilitate the achievement of learning outcomes: focus and contextualisation of the subject; the quality of resources provided (both obligatory and voluntary) for continued learning; the relationship between the readings given and the videoconferences; supporting material for completion of the course; and the activities used for assessment purposes. Regarding this last item, students approved of the way these were linked to practical examples or problem-solving, and appreciated the level of detail in which they were explained:

> [I appreciated] the reading given and its correlation with the contents developed (SLIT51). The fact that the assessed activities are based on real examples helps with the engagement of the student in their learning (SPE69).

> [I liked] the way in which the topics were delivered, the reading list and the proposed activities, since they allowed me to integrate the readings. In addition, the comments and corrections of the pieces of work carried out are a valuable learning tool, as are the evaluation criteria themselves (SLIT9).

With respect to the transversal competences of the teachers, some of the elements most highly rated by the students included: their technological competence in the use of the platform (managing the forums and discussions); the communicative ability they demonstrated in the video conferences or their interactions with students; their speed and efficiency when giving feedback and clearing up doubts; and their overall warmth and clarity. Furthermore, the students gave a positive assessment of the ability of the teacher to foster certain competences among the students themselves (critical thought, autonomous, self-directed learning, etc.):

> In the videoconferences, the teacher explains the practical projects they set for students in a very detailed way, using examples (SRSE31). The teacher's explanations and the activities that have been set have been very clearly presented; the way they work is excellent (SSPEM33).

> The teacher makes great use of the discussion board. The debates they propose definitely enrich the learning in their subject. Equally, the explanation of topics in their videoconferences is highly educational thanks to the visual aids of which they make use (SLIT22). The forums seemed to me a very good way to evaluate the contents of the subject and to encourage students' critical analysis (SLIT7).

> [I appreciated] the availability of the teacher, they were always very diligent in responding to doubts and requests for clarity (SSPEM39). The fluid communication with the teacher

and the care and attentiveness with which they treated students' comments and work [were positive aspects] (SPE138).

Nevertheless, there are also elements which require improvement—in fact, many of these run counter to the positives above and appear with the same frequency. Students ask for a greater number of video conferences, in which to integrate theory and practice, and which they emphasise should be more clarificatory and pre-planned in line with an awareness of different possible eventualities:

> I think more video conferences with practical demonstrations (by teachers or assistants) would be very beneficial for the teaching and learning process in this subject—in order to, for example, demonstrate how to determine the given urban planimetry and propose the planning and management of such spaces based on a given set of objectives (SSPEM29). The videoconferences focus on instructions for carrying out the activities; there is no intervention from the teacher regarding the subject. The videoconferences should be more explanatory, should clarify concepts, should provide new knowledge and course information, rather than merely explaining activities. There is a serious lack of support when it comes to fundamental ideas … there was no coherence between the videoconferences and the course contents (SPE68).

Furthermore, they raise some issues with the evaluation system, including but not limited to the following recommendations: assessment activities should be better explained, detailing clearly the steps to be taken; there should be transparency in the evaluation criteria, and more time should be given to complete these activities. Crucially, the material should be planned and structured better, the course contents should be improved (by updating them, organizing them, and adapting them to the students' specific profiles) and spaces for students to interact and have discussions should be promoted:

> [They should] provide and direct us to more practical work models, as I did not manage to understand what it was about (SRSE13). The guide to carrying out the activities is not clear; in the feedback, the teacher asks for aspects which are not in the guide (SPE88). There is a lack of clarity when presenting the exercises. Presumably, the teacher's role is to ensure that they are clear from the very start. The students complete the aims—at least with respect to the activities—of the work set, but this is not reflected in the grades given. This leads to frustration for the student when he believes that he has completed what has been asked of him in the work set and yet find himself with a grade which does not match his expectations. It is important to consider this at the time of setting the exercise—what are the expectations of the teacher and what does he or she expect to find in work submitted? (SSPEM70).

> Considering that it's an international master's, it's important to remember to include in the resources some materials which refer to countries outside of Europe (SSPEM3). Given that this is an international master's, not only drawing examples from—and focussing on—the Spanish context, but also to look more at knowledge in general and the wider context [would be an improvement] (SRSE51).

Regarding the teacher's skills, the results show that they need to work on their communicative abilities and their interaction with the students. For the students, the following are all of the utmost importance: the speed with which teachers reply to questions; the thoroughness of their comments; and that they improve their technological skills in order to effectively promote student-teacher interaction—that is, that they can integrate new technology into their role as a teacher in an effective way:

> Teachers should have enough time to develop the role and should reply to emails. Just as they make demands of us, we demand that they give us our results on time (SRSE21). The teacher needs to organise their time to be able to provide better support to students—at times it was very difficult to get a reply or clarification from them. They were a good teacher but need to adjust the way they communicate with students to bring it into line with the needs of distance learning (SLIT31).

> The feedback received from the teacher was lacking—it was limited to simply giving the grade for the subject, without any substantial feedback. As such, the feeling was the same as in other subjects: you limit yourself to carrying out the task without learning anything, as you don't find out what mistakes you've made. I would consider it a positive, helpful step for the teacher to provide us with a model example of the activity, perfectly resolved (SSPEM69). Communication with the teacher was a total void—I sent her an email, and she never replied. She didn't explain anything and didn't reply at all. I found the material to be improvised and very demanding for us students, in that they sent us a massive amount of readings and didn't explain the key concepts (SSPEM49).

> The teacher was not up to teaching the class—they didn't reply to the concerns we raised and didn't return evaluations in a timely manner. The teacher knows a lot, but should also guide, direct and teach the students. I think the teacher needs institutional support in order to adequately perform the role of companion in the learning process, and to improve their relationship with their students (SPE78).

Teacher surveys

Regarding the **institutional context**, the teaching staff expressed a high degree of satisfaction with the organisation of the institution, giving a high grade (8.2 on a scale of 1 to 10) to work done by those who catered for student needs and to the coordination of the programs. One of the most common suggestions was that the platform be made more "user-friendly" and more pedagogical, to add more to the learning process, and they had similar issues with the way the videoconferences were arranged (6.5). Furthermore, some teachers put forward proposals designed to help balance the demands of the training with the reduced time-frame within which the materials were delivered (webinars, conferences, workshops, etc.):

> We have had some problems with student matriculation, which has meant that the number of students on the course has constantly been fluctuating—this was resolved thanks to the efforts of the program manager and master's coordinator, but it was difficult for us teachers to deliver the subject under these conditions (TRSE9).

> The continued use of training sessions seems totally necessary to me, and I believe it would be interesting to widen this initiative to run throughout the whole process (TPE8).

Regarding the profile of the **students**, the teachers expressed their level of satisfaction with precision; this, along with the assessment of the technological infrastructure, was the most commonly occurring aspect of the surveys. Other aspects related to the fluidity of communication with students and their engagement in their subjects also stood out. They give a reasonable grade to the three items (6.2), indicating that improvements are required:

> I found the student profiles to be very varied, not only with respect to their prior knowledge and experience but also to their knowledge of the academic environment and the virtual context in general (TLIT5). The students at times demonstrated a very low level, and much time and effort were necessary in guiding them through their final projects—there should be a stricter selection process (TSPEM11).

> The students barely participated in the videoconferences (a few due to internet connection difficulties). The level of attendance of the videoconferences was very low, nor did they subsequently access the recording (TSPEM7). At times it's demotivating dealing with the minimal interaction between students in spite of our best endeavours (TLIT2).

> I think that the time dedication necessary for students should be emphasised—it should be made clear to them that a master's with this number of credits requires dedicating yourself for at least a couple of hours a day, or entire weekends. It is almost impossible to combine this course with full-time work, family life and social life, in such a way as some students are attempting (TPE1). In general, taking into account that this is a distance-learning course, I think it's very important for the learners to read a lot in order to make up for the lack of 'face-to-face teaching' (TRSE2).

However, we see a different picture when the groups of subjects are reduced (as in optional subjects). Here, the general level of satisfaction increases significantly:

> We have here a much smaller group and so a closer, more personalised attention to their needs is made possible, and this improves the fluidity of communication between students and teacher (TPE11). As this is a non-obligatory subject, the students are more engaged and put in more effort, although in a nevertheless somewhat limited way from my perspective as a teacher, which explains the low grade (TSPEM15).

In the self-assessment section, the **teaching staff** has been self-critical, proposing improvements in both pedagogical aspects and transversal skills. They are more satisfied with the subject in general, and the methodological approach adopted (7.5) than with specific elements of these such as the choice of materials, the activities proposed and their evaluation (6.6):

> I teach the same subject in face-to-face master's classes, and I find it very difficult to adapt all of the content to a course of only four weeks; I have my doubts over whether I have made an appropriate selection in the contents which I teach online (TPE3).

It would seem to me a positive step if there were more transparency between the different subjects (sharing the teacher's guides, for example) to be able to avoid overlap in their contents and to be aware of whether they deal adequately with concepts which perhaps could be transversal (TLIT3).

My fellow subject teacher and I have discussed changing the materials used for the next iteration of the course, as well as some aspects of the assessments, based on the comments received from the student body—for this reason; we value the students' feedback. Nevertheless, in this most recent course communication has been stilted and in their evaluations, they complain about issues which were not raised during the course (TSPEM5).

The evaluation system in previous iterations has been very focussed on the production of written work, so for the next iteration; I have made the decision to introduce also a test to evaluate the level of understanding of basic concepts (SRSE3).

With respect to transversal skills, the teachers indicated that the development of optimal time-management is linked to their performance of their teaching duties. Likewise, they consider it necessary to improve or consolidate their technological knowledge and those skills related to carrying out their role as learning facilitator:

I had a serious technical problem in the first videoconference, which produced a certain uneasiness in the students and myself, until I realised—at the time of the second videoconference—that it was a problem with my Wi-Fi, as I don't have a fibre optic connection (TLIT1).

Teaching classes in a virtual environment has led me to realise how many hours are necessary to give an appropriate level of attention to the needs of every student (TSPEM7).

Finally, although they are happy with the established work of the coordinators (8.7), one teacher made an interesting reflection regarding possible improvements:

In the subjects where there is more than one teacher, I think there should be an overall coordinator of the subject, as this requires a considerable degree of dedication (updating materials and activities, organising meetings, establishing evaluation criteria, carrying out videoconferences) that is not currently taken into account (SSPEM1).

Discussion and conclusions

There are two features of **virtual training** which have been instrumental in its development: flexibility in terms of time management for students; and the elimination of space and time barriers. In this sense, UNIBA has completed its proposed objectives, by providing an adaptable setting which makes synchronous and asynchronous learning possible (Sáez, Domínguez and Mendoza 2014) and by overcoming limitations of space and time. The organisational structure has also given support to the project, which is, as García et al. (2018) note, vital for its success.

However, there are still aspects in which improvements are necessary. For example,

both students and teachers agree that improving the design of the platform (that is, not only the content but also the technological and interactive aspects, the perception of ease-of-use, and the flexibility, supportiveness, and attitude of the tutor) will have a positive effect on the training provided. Learning must take place about, through and with new technologies (Hernández, Fernández and Pulido 2018).

Another element under scrutiny has been the organisation of the program (the 'cronogram'). Rethinking the structure would help overcome student concerns regarding balancing the requirements of the course with the time they have available. Although UNIBA's online programs are based on the face-to-face courses offered by the University of Barcelona, their philosophy of not overlapping subjects (which generally run one after the other) means that the UNIBA course must be completed in a far shorter period. As such, students have a feeling of being 'drowned' under constant, demanding work, putting a strain on their other professional and familial roles. Therefore, the structure of the programs needs to be reconsidered in a way which ensures their quality but also takes into account the needs of UNIBA's students.

Also, given the internationalisation of these programs, the academic cultures and overall contexts of the students often differ, as can the conception that they have of the profession. This can at times affect the educational approach of the teacher, presenting a challenge in terms of balancing the expectations of students and the professional role which they will go on to perform.

This connects to one of the most discussed, and most controversial, elements in the surveys: the **students' profiles** and their motivations for taking up the course of study. For the most part, they are women with jobs and dependents. Given this profile, Adell and Sales (1999) suggest they will be looking for "learning based on the immediate"—that is, something which will be practically and directly useful in their lives. Therefore, their intrinsic motivations for joining the course relate to their immediate professional development— gaining new knowledge and making global and systemic discoveries do not figure into their expectations (Figuera et al. 2018). The attitudes of the students are made up of affective, cognitive and behavioural components, factors which lead them to be drawn towards certain objects or behaviours and away from others. Aspects such as self-confidence, use of technology, gender, learning style, and physical and psychological profile have a significant

influence on the attitude of the student towards online learning, the program interface, its ease of use and the interaction that takes place through it (Hernández, Fernández and Pulido 2018). The perceived utility of the training for the student has a considerable influence on their attitude towards virtual education, while ease-of-use has a more moderate influence on the student's attitude (Pilli, Fanaeian and Al-Momani 2014). An effective use of new technologies contributes to improving the academic performance of the student; those students who are most satisfied with the context (that is, the organisation of the program) are also the most satisfied with the learning which they take away from it (Mothibi 2015). All these elements need to be considered when it comes to proposing methods for positively adapting the teaching-learning process.

With respect to the students' profiles, the teaching staff has been critical of students' ability to adapt to the requirements of the program and ask that the entry requirements be scrutinised and adhered to.

Furthermore, they see familial and professional commitments as causing difficulties when it comes to fluid teacher-student communication and overall student engagement with the subject. This perception is not shared by the students themselves, in particular when it comes to courses with lower student numbers. This is another point with which the teaching staff took issue: the high (and increasing) number of students per iteration of the course. This is exemplified by one teacher who, in one of their comments, notes that they strongly disagree with the policy of maximising profits by admitting a higher number of students despite the detrimental effect that this has on educational attainment. It is vital to recognise the expectations the students have of virtual education to be able to provide them with an education which meets their needs and leaves them more satisfied (Hernández, Fernández, and Pulido, 2018). Nevertheless, a series of clear demands must be set out for the student, in order to avoid the clashing of their expectations with the quality demanded by the programs of the University of Barcelona, as mentioned above.

Adding to the high student intake the fact that each iteration of the course runs twice per year, and adding on top of that the numerous competences demanded of teachers by this mode of training (in particular the time required for managing interaction, with interaction-based tasks being those which occur most frequently and which are most time-consuming for teachers (Darabi, Sikorski and Harvey 2006)), the result is a disgruntled, demotivated

teaching staff. It must be taken into consideration that these teachers by and large come from face-to-face teaching contexts and, through lack of specific training for working in virtual environments, reproduce previous teaching habits which are not fully appropriate for these new settings (Quinn 2009).

With respect to the three fundamental elements of the training process (the role of the student, the pedagogical support supplied by the teacher, and the object of learning) (Onrubia 2016) and the interaction between these elements, there are pedagogical aspects here which it is interesting to stop and consider.

The **teachers** question their own specific competences in relation to this point, given that adapting the contents and proposals in order to keep them up-to-date in a world of information overload requires time and energy which are not always available. On the other hand, they see real value in collaborating with their fellow teachers when they work together on the same course and propose the introduction of a coordinator to foster such collaborative working.

Regarding the transversal skills which the teacher must acquire, technological and communicative competences are essential (Darabi, Sikorski and Harvey 2006; Pereda 2016; Sánchez, Olmos and García-Peñalvo 2017). It is clear that teachers should not only acquire technological competences but also that they should learn to integrate new technologies into their teaching practice in an effective way.

In this sense, the focus must be on incorporating new technologies with teaching processes, rather than solely on technological aspects, as pointed out by Onrubia (2016). Turning to the communicative competences, it is fundamental for the teaching staff to actively promote interaction within the group, concerning themselves also with the students as individuals, and interacting with them directly as such; the effectiveness and rigorousness of their communication and the appropriacy of their answers—in tone, clarity, and quality—are the hallmarks of a good teacher (Nicol 2010; Pereda 2016; Sánchez, Olmos and García-Peñalvo 2017). One of the most commonly employed methods for encouraging this type of interaction is the inclusion of collaborative working tools. The teaching staff differs in their assessments of the utility of this method since they don't believe the democracy and solidarity of the group nor the autonomy in organising their own work have been achieved (Adell and Sales 1999). The failure, according to the surveys, is in the execution rather than the idea

itself.

On the other hand, the teaching staff emphasise the necessity of fostering in the students the development of critical thinking skills and autonomous learning—aspects on which work must continue, as noted in the report of the AQU (2017), and which are also two of the most in-demand competences in the professional sphere. Some teachers, however, raise doubts regarding their awareness of the role of facilitator in the teaching-learning process (Goodyear et al. 2001). The students, meanwhile, gave a positive evaluation to those learning activities based on problem-solving—that is, 'learning by doing' (Evensen and Hmelo 2000)—and also to the potential for self-directed learning afforded by training in virtual environments (Gi-Zen and Gwo-Zen 2010). Thus, there is a contrast between the teachers' perceptions and the students' experience, as the success of these elements must, of course, come down to the role of the teachers as facilitators in the process.

Similarly, the students gave a positive evaluation of the expertise of the teaching staff with respect to aspects such as quality of resources chosen, material provided and activities proposed (Anastasiades 2010; Onrubia 2016), and to the videoconferences, emphasising that these have the capacity to give depth to the material in terms of linking theory and practice. This reflection is perhaps at odds with the demand for immediately applicable learning discussed by Adell and Sales (1999).

The challenge, then, lies in being able to open spaces for students to interact with one another in which the teacher can follow the process to support them in their learning (Anastasiades 2010). The figure of the tutor in virtual spaces is therefore vital for the provision of the sort of effective professional and academic support which encourages autonomy and self-direction (Goodyear et al. 2001; Hernández, Fernández and Pulido 2018). A sense of isolation for students can lead to them becoming disoriented, consequently developing negative attitudes towards online learning and then finally abandoning their studies; a sound understanding of and respect for the role of the tutor in these spaces, on the other hand, can help to prevent this negative cycle.

Finally, we must turn again to the three essential elements mentioned by Onrubia (2016): the role of the student; the pedagogical support provided by the teacher; and the object of learning. Of the three elements, the object of learning is perhaps the most 'controllable', and, without downplaying the importance of (and effort involved in) staying up-to-date, is the

least 'changeable.' The teaching-learning context in which the teachers and students find themselves is marked by a series of structural and individual factors which can have both positive and negative effects, and which determine the complexity and uniqueness of each educational experience. Two inherent features of the learning process for students in virtual environments can thus be drawn out: (1) structure and organisation of the object of learning which shows a concern for the quality of the programs offered and balances this with the profile of the students; and (2) the cognitive structure of the student and their expectations of the program, adapting and making use of the training tools, the complementary training subjects and the intrinsic motivations laid out by Figuera et al. (2018). Additionally, we must reflect on the importance of analysing the nature of our students and teachers, and through this reflection learn more about how to carry out effective training in the process of teaching-learning in virtual environments.

This study has carried out an analysis of the competences and strategies that teachers must put into practice when teaching in virtual learning environments and has done likewise regarding the evaluation which both students and teachers make of this teaching process. As this is a diagnostic study, putting together a collection of concrete methods for improving said process is outside of our remit; the starting points of a search for such methods have, however, been identified.

In terms of the limitations of this study, it is worth noting that although we have worked with secondary data which we received from the institution, which has of course not been able to provide the level of detail we might have hoped for, it has nevertheless given us a valuable global view of the issue at hand and has allowed us to reach our proposed aims. An additional challenge faced was that of UNIBA being a very young institution; they have, though, shown a great willingness to contribute to the production of this preliminary study, a willingness which they intend to carry into future research. Consequently, we see it as vital that: (1) the opinion of all parties involved in training within UNIBA is made known; and (2) discussion groups are formed which will allow us to obtain primary data with which to consolidate this line of research.

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TABLES AND FIGURES

Table 1. Distribution of the population and sample in the participating master's degrees

•	Population	Sample	Sampling Error
Advanced Studies in Spanish and Latin American Literature	74	61	
Renewable and Sustainable Energy	99	94	
Spatial Planning and Environmental Management	108	93	0,8
Psychology and Education	161	158	
Total	442	406	

Table 2. Profile of students on the master's analysed

Master's	Sample	Age	Women	Recently graduated or without work experience	Work related to the training	International students	Self-financing	Live independently
	(n)	(Average)	(%)	(%)	(%)	(%)	(%)	(%)
Advanced Studies in Spanish and Latin American Literature	61	39.0 (10.91)	68.8	28.1	83.9	5:3.3	81.3	79.3
Renewable and Sustainable Energy	99	35.3 (8.42)	27.3	18.2	90.9	82.4	72.7	72.7
Spatial Planning and Environmental Management	93	39.1 (9.44)	37.5	14.6	91.1	90.7	85.4	84.8
Psychology and Education	158	32.9 (8.26)	84.9	26.0	88.2	57.1	60.3	75.0
Total	**406**	**37.2 (10.15)**	**68.8**	**22.1**	**85.5**	**55.4**	**72.3**	**80.2**

Table 3. Distribution of the population and the sample in master's teachers

	Population	Sample	Sampling Error
Advanced Studies in Spanish and Latin American Literature	14	7	
Renewable and Sustainable Energy	19	9	
Spatial Planning and Environmental Management	27	20	5.4
Psychology and Education	23	13	
Total	83	49	

Table 4. Structure of the questionnaires used for the research

Dimension of the instrument	Student Questionnaire	Teacher Questionnaire
Institutional Context	Open question: *Suggestions for improvement.* From this, elements linked to the **organization** and **structure** of the **institution** are identified.	Open question: *Satisfaction with the organisation*, *its structure and resources.* From this, elements linked to the **institutional context** are identified.
Students	Open questions regarding (1) the *suggestions for improvement* and (2) the *aspects of the subject which have helped them most in the learning process*. From these, **characteristics of the students' learning processes** have been analysed.	Likert Scale question regarding the *satisfaction with the student profile.* From this, the **academic and work background** from which they access the program, and their **involvement in the program** have been analysed.
Teachers	(1) Likert Scale question regarding the *work of the teacher:* **materials, proposed activities, system of assessment, time management, communication and interaction**, and (2) open question regarding the *aspects of the subject which have helped them most in their learning process.* From this, satisfaction with said elements has been analysed.	(1) Likert Scale question regarding the *teacher's own self-assessment:* **coordination with other partners, materials, proposed activities, system of assessment, and time management**, and (2) open questions regarding the level of *overall satisfaction with their own performance and suggestions for improvement.* From this, satisfaction with said elements has been analysed.

Table 5. Synthesis of Results

DIMENSIONS	STUDENT SATISFACTION		TEACHER SATISFACTION		DIMENSIONS
	(+)	(-)	(+)	(-)	
INSTITUTION	Time management flexibility (work & family) Overcoming space and time barriers Course type offer	**Need to improve the technological infrastructure** Programme adjustment to their profiles and needs Institutional support to teachers (training—mainly in relation to ICT) **Nature of the programme (time/demand imbalance)**	Institutional structure and support Training sessions	**Technological framework (neither user-friendly nor pedagogically intuitive)**	INSTITUTION
LEARNING ELEMENTS	**Interaction with teachers & peers (group work, group discussions + cultural enrichment)** Self-directed learning (promoting autonomy)	**Higher number of video conferences (theory-practice)** Don't feel prepared enough to face learning Be more self-critical and more autonomous **Content adjustment to their profiles and needs (absence of previous knowledge + work & family)**	Interaction with students and their involvement (which improves with fewer students in open elective subjects)	**Student profile** Student involvement Fluency of interaction with students	STUDENT PROFILES AND ENGAGEMENT
TEACHING PRACTICES	Teacher expertise (re knowledge, course teaching & management—VC, doubts, instructions, explanations) **Quality of content and resources (course + self-directed learning)** **Activities related to putting theory into practice (simulated practices, problem-solving, etc.)** Level of detail in assessment Teacher's digital and communicative competence, and ability **to manage interaction** **Teacher's feedback: effectiveness and promptness, transparency and quality**		Course methodology, time management and course and content design **Coordination with peers (subjects taught jointly)**	**Assessment process (activity selection, criteria to assess learning, etc.)**	SELF-ASSESSMENT

Figure 1. Drafted online instructor competencies identified from literature review

1. Manage logistical aspects of the course
2. Exhibit effective written, verbal, and visual communication skills
3. Provide learners with course-level guidelines
4. Evaluate effectiveness of course
5. Assess learners' learning based on stated learning goals and objectives
6. Create a friendly and open environment
7. Facilitate productive discussions
8. Stimulate learners' critical thinking
9. Employ appropriate types of interaction
10. Provide timely and informative feedback
11. Identify when and how to use various instructional methods
12. Monitor learner progress
13. Employ appropriate presentation strategies to ensure learning
14. Ensure appropriate communication behavior within the given environment
15. Assist learners in becoming acclimated to the given environment
16. Encourage learners to become self-directed and disciplined in their educational pursuits
17. Foster a learning community
18. Use relevant technology effectively
19. Accommodate problems with technology
20. Improve professional knowledge, skills, and abilities

Figure 2. Indicators associated with the dimensions of the study

Dimensions	Indicators
Institutional context	Problems with the technological infrastructure
	Flexibility in time management
	International character of the programs
	Relation between time available and academic demand
	Nature of the program (organisation, structure, content, etc.)
	Institutional support for those involved in the program
	Range of programs offered
Students	Admission profile
	Interaction
	Self-directed learning
	Multiculturalism
	Goals and expectations with respect to the program
	Work and family responsibilities
	Prior experience and knowledge in the field
	Place of residence (differing time zones)
Teachers	Technological knowledge
	Ability to integrate ICT into student activity
	Mastery of the discipline
	Interaction
	Communicative abilities
	Ability to integrate theory and practice
	Clarity of instructions and explanations
	Quality of feedback
	Pedagogical support
	Time dedicated to the subject
	Evaluation system