





## Digital Learning in Higher Education: A Training Course for Teaching Online - Universidade Aberta, Portugal

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### Abstract

This paper uses qualitative evidence to describe, explore and discuss the progress of the online teaching training course taught at the Universidade Aberta to Portuguese and foreign professors of higher education institutions. As this is an entirely online course, its pedagogical design results from the combination of the basics of open distance education and network education using the Moodle 2.0 platform and other digital environments. The results point, on one hand, to a dynamic pedagogical design that addresses the need for continuous improvement, and, on the other hand, to the changes in the role of professors in virtual teaching and learning environments, and to the different and specific pedagogical strategies in need of adjustment. They also point to the strong presence of technological and pedagogical elements of innovation.

**Keywords:** Higher Education; Online Teaching; Open Distance Education; Networking; Innovation; Teacher Training

### Introduction

The rapid and profound changes in today's network societies pose challenges and demands that need to be addressed in time by individuals and institutions. Lifelong learning and life wide learning have become essential and, in this context, Distance Learning and eLearning have an increasingly more important role to play in providing answers to those needs. As a consequence, higher education institutions have been implementing forms of teaching and learning that include online education, with the purpose of diversifying their educational offer and reaching new audiences. This brings profound changes to face-to-face teaching practices that seek to include typical distance learning approaches. However, this is a greater challenge that is not going to materialize by simply transposing the face-to-face teaching practices to network virtual environments, but rather imposes changes supported by research in teaching practices in virtual environments to enable us to integrate contemporary and emerging models that characterize the teaching and learning digital territories.

The results of the study on distance learning carried out by the *Observatory of the Quality of Distance Learning and eLearning* in Portugal have revealed a wide variety of distance learning forms and practices, and the absence of groundwork thought in this field in the respondent higher education institutions (Dias et al., 2015). This diversity can be put down to two factors: the lack of public regulation and the lack of professor's training. In Portugal, Universidade Aberta (UAb) is the only public distance higher education institution, with almost 30 years of experience and production of knowledge and innovation in the field of online network distance education. Aware of its social responsibility as a leading pioneer institution in this area in Portugal, it was felt that it would have to give an active contribution to the globalisation processes of education, arising from the profound technological advancements in recent decades that have had a considerable impact on the distance learning and network systems. Universidade Aberta has, therefore, taken on a collaborative role in sharing and putting its strategies on the renewal of pedagogical thought to the use of higher

education institutions –traditionally steered to face-to-face education–, an essential condition to act in virtual learning contexts (Dias, 2015). In this environment of support-oriented cooperation with institutions in Portuguese-speaking states and countries which seek to develop distance learning models, the authors of this paper –professors at the Department of Education and Distance Learning of Universidade Aberta– were asked to design the *Online Teachers Training Course* (CFDO). This course follows the *Virtual Pedagogical Model*® of UAb (Pereira, Mendes, Morgado, Amante & Bidarra, 2007), specifically designed for virtual teaching and based on the principles of interaction, student-centred learning, flexibility and digital inclusion.

Our paper aims to describe, explore and discuss the progress of the course taught along its various editions. Although the quality of the course is constantly monitored, with six editions having been completed, we believe we now have consistent results to serve as the basis for analyzing aspects such as the pedagogical design of the course, the critical issues on the quality of online teacher training, and on the pedagogical innovation in digital territories. Our work will, therefore, build on these three perspectives to expand on theoretical issues and achieve empirical observation, as shown below.

### Theoretical perspectives

In this study, the three-pronged analytical model breaks down the data on the online teacher training course which, although analytically different, are closely interlinked. These perspectives are: the pedagogical design of the course; the critical issues on the quality of online teacher training; and the pedagogical innovation in digital territories. First, we will briefly review the theoretical characterization of each perspective, emphasising, as already mentioned, that we will go into more detail when discussing the results.

The first perspective refers to the online teaching and learning processes in higher education. Where it relates to professor' training, this becomes a particularly challenging exercise, as it requires specific innovative models, methodologies and strategies. This means that special attention must be given to the pedagogical design. For the online teacher training course, we chose to follow a “contextualized institutional design” (Filatro, 2004), in other words, with dynamic and recursive characteristics in which the design, objectives, development, implementation and assessment unfold in a spiral.

It should be made clear that we recognise the term ‘pedagogical design’ as being the most appropriate, as we believe it gives an idea of a more constructivist and humanistic teaching and learning process, therefore this is the reason why we will use it. This concept –pedagogical design– has been addressed by many authors (Ling & Marton, 2012; Häkkinen & Hänämäläinen, 2012).

In the context of a dynamic pedagogical design, participants are involved in processes of “research and training” (Macedo, 2006; Reiser & Dempsey, 2007; Silva, 2015). That is, the educational process and the change in practices encompass a questioning, critical and investigative attitude. The main challenge is, therefore, to develop a educational offer defined by a pedagogical design that combines resources and technologies with the search for knowledge and understanding, capable of developing skills to allow all participants to become better pedagogical designers. One of these digital tools is the ePortfolio, which collects the compiled works on a webpage with links to other Internet resources (Moreira, 2010). Helen Barrett says “an ePortfolio (electronic portfolio) is an electronic collection of evidence that shows your learning journey over time” (2010, p. 6). Like Moreira and Ferreira (2011), it is also our opinion that ePortfolios or digital portfolios have a wealth of potential, as they can include static or animated images, videos and music to complement and enrich the text. The use of hyperlinks to other documents or to resources available online also enhance the ePortfolio and,

at the same time, emphasize the constant dynamics of knowledge and learning, which are of the utmost importance in our society today.

The second perspective of analysis concerns the critical issues of quality of online teacher training. The purpose of monitoring the quality of contextualized pedagogical design is to promote the knowledge about teaching and learning processes in an integrated manner, in a sense of continuous improvement (Filatro, 2004). This knowledge is intended to contribute to the development of organizational strategies in higher education, as we believe that more important than discussing face-to-face, semi-distance, or distance teaching courses, we need to discuss what type of education we want and what strategies are under way so that it can be achieved with excellent quality standards.

Although quality is a subjective concept that cannot be directly benchmarked, it has received much attention from researchers (see, for example, the works of Lim, Lee & Nam, 2007) and international institutions (for e.g., the European Quality Observatory). Ensuring an appropriate control and monitoring of the critical issues of online teacher training presupposes, in this context, paying systematic attention to and critically reflecting on the information obtained throughout the pedagogical design process, and also using that information to improve the quality of resources, e-activities and learning environments (Romiszowski, 2004).

Finally, the third perspective of analysis relates to the pedagogical innovation in digital territories, which presupposes that changes in culture and knowledge are supported by research in educational practices in virtual territories, where collaboration, social and cognitive roots and pedagogical mediation are the main means to achieve sustainable network learning. Such pedagogical innovation is based on a change of educational paradigm, characterised by connectivity, flexibility, personalisation, speed and fluency, and by the use of open resources and social networks.

To operate in teaching and learning scenarios in networked knowledge societies, the nature and requirements of professor' training will have to take into consideration the training of competences with a view to inclusion, participation and collaboration in the joint construction of new knowledge (Dias, 2012). In other words, the scenarios that emerge from network learning go far beyond technological expertise, in that technologies themselves do not call to action, but provide a sustainable change for innovative and creative knowledge, supported by pedagogical dynamics that foster valuable opportunities for "learning to be and learning to learn" (Fullan & Langworthy, 2014; Massano & Henriques, 2016).

Pedagogical innovation in digital territories involves the development of skills in critical and creative problem solving, communication, sharing and collaboration, and relevant knowledge. These skills presuppose a particular focus on course pedagogical design, especially the critical issues of the quality of online teacher training. Before analyzing and discussing the data, a number of methodological issues need clarification.

## Material and Methods

The main aim of this paper is to describe, explore and discuss the progress of the online teacher training course taught at Universidade Aberta to Portuguese and foreign professors of higher education institutions. As this is an entirely online course, its pedagogical design results from the combination of the basics of open distance education and network education (Dias, 2015; Aires, 2016) using the Moodle 2.0 platform customized according to the principles of the Virtual Pedagogical Model® of UAb, and other digital environments and tools.

The Virtual Pedagogical Model was specifically designed for the teaching and learning processes at UAb and is based on the following key principles (Pereira et al., 2007):

- i) Student-centered learning, making students actively responsible for their knowledge building process.
- ii) Education based on the flexibility of access to learning (contents and activities), without time or space constraints, according to the students' availability. This principle is materialized by prioritizing asynchronous communication, in which space and time do not have to coincide, since communication and interaction is made whenever it is convenient for the trainee, allowing him/her to read, process the information, think about it, and engage in a dialogue or interact.
- iii) Education based on diversified interaction between student-professor and student-student, or even between the student and the resources. According to this principle, the professor has various communication devices to plan and design according to his/her pedagogical strategy.
- iv) Education that promotes digital inclusion, in that it helps adults (students) access and master technologies, who might not otherwise be able to develop those skills.

In this model the student is integrated in a learning community that develops pedagogical thinking, as a result of the participation and collaboration in the joint construction of learning (Henriques, Moreira, Goulão & Barros, 2016; Goulão & Henriques, 2015). The nature of this issue led us to consider an approach like *Design Based Research* (DBR), which relies on the concept of design experiments. According to Wang and Hannafin (2005), this research methodology in education enables an accurate and reflexive research to test and develop innovative learning environments. This methodology seeks to study educational problems in real contexts of pedagogical activity, combining theory and practice through collaboration between researchers and professional. The DBR is based on epistemology considerations that consider that the main goal of the research is to solve real problems, and at the same time it allows the construction of design principles that can influence future decisions. The study approach is qualitative and is based on data from the six editions of the online teaching training course already completed. The instruments that served as a basis for data collection were an online questionnaire survey and an information registration grid.

## Analysis of results and discussion

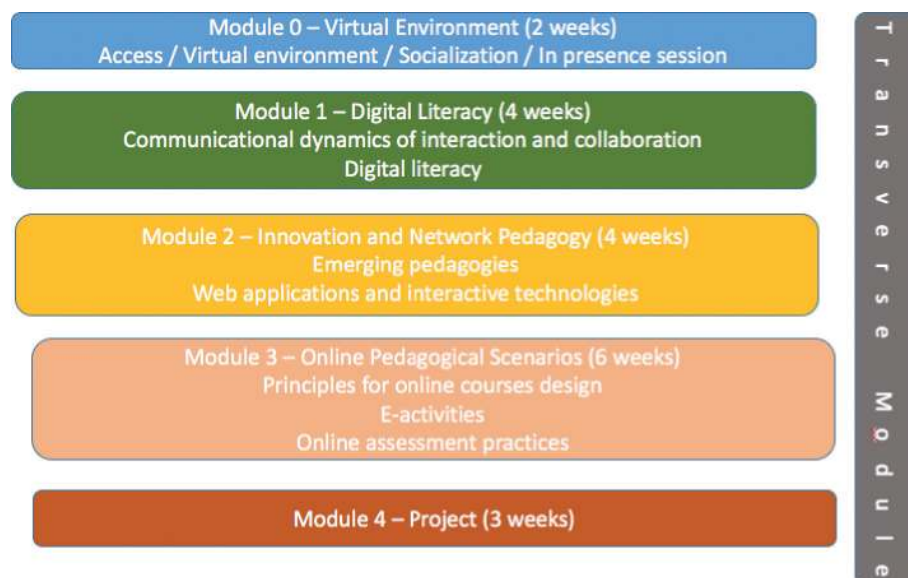
The purpose of the online teacher training course methodology is to develop students' pedagogical, technological and digital literacy skills. As the target audience is student professors of higher education institutions, it is important that they acquire these skills and, at the same time, be prepared for developing their own students' scientific, technological and digital literacy skills in virtual teaching and learning contexts.

Several changes were introduced in the various previous editions with a view to innovative co-learning design (Henriques, Moreira, Goulão & Barros, 2015). This means that the pedagogical design of the CFDO is dynamic, in that it integrates changes, adaptations and innovations in its overall structure and in the strategies of each course module. Some of these changes include, in particular, the increased use of Open Educational Resources and free access social web software, which allowed for adjustments to the educational ecosystems built and designed by the course professors in each module; and the introduction of an ePortfolio built by the trainees, also using web 2.0 software, aggregating all the work carried out in the various course modules. This ePortfolio has three distinct and complementary functions:

- i) The professors monitor the ePortfolio and assess it as to its contents.
- ii) The trainees add their own thoughts about their training path to the contents and resources.

- iii) Ultimately, the ePortfolio is an important working tool for the trainees, who, as professors, will have an archive of materials (contents, resources, e-activities) and their own thoughts on their own development (progress and setbacks, difficulties and strategies to overcome them, strengths and areas for improvement).

The results of the analysis of the pedagogical design of the online teacher training course point to adjustments needed to strengthen the approach to professional academic contexts, that is, the opportunities for continuous improvement are directly related with the skills to be developed. We therefore need to describe the structure of the course under analysis (Figure 1).



**Figure 1: Structure of the online teacher training course**

The course load is 10 ECTS (European Credit Transfer Credit System) over 17 weeks of training, preceded by an online adaptation module lasting 2 weeks that has a two-fold purpose. On one hand, it is intended to familiarise students with the learning environment and with the Virtual Pedagogical Model® of Universidade Aberta. On the other hand, the purpose is for the students to get used to being online students and to acquire the basic skills to attend the course. In addition to the adaptation module, there is also a cross-cutting module of digital tools that accompanies the student throughout the whole course, aiming to help the student explore and use different softwares, applications and Web 2.0 interfaces. The *Digital Literacy* module covers two main topics –*Communication and Online learning*–, which address the communication and interaction processes and the individual needs of each student, and the topic of digital literacies, which refers to the digital skills needed in ubiquitous learning contexts. Module 2 –*Innovation and Network Pedagogies*– covers two main topics: *Emerging Pedagogies*, which focuses on theories of learning underlying Web 2.0-based pedagogical approaches; and *Web Applications and Interactive Technologies*, which explores the potential of pedagogical use of some Web 2.0 and social networks text, image and sound editing tools. The third module, *Online Pedagogical Scenarios*, covers three topics: *Principles for the Design of Online Courses*, which focuses on some essential components and principles in the design of online courses; *E-activities*, which focuses on the structure required for an active and interactive online training that caters for the students' different ways of learning; and the topic *Online Assessment Practices*, which systematizes the challenges, contexts and assessment practices in online learning environments. Finally, the *Project* module, organized around the main axes behind an online course – planning, project, design, and



development. In all these modules, innovation also arises from the articulation between the various technological platforms used and the social web softwares, in a *Blended (e)Learning* system that make the educational experience even more meaningful.

Each module was structured by professors with expertise in the field, who work at the Department of Education and Distance Learning of Universidade Aberta, using pedagogical strategies that include findings from recent research in the field of online pedagogy. Moreover, expert professors of recognised merit in the areas, of universities from different countries and invited by the UAb also collaborated in each of the modules. The course trainees are professors who work at higher education institutions in Portugal and in other Portuguese speaking countries.

One of the course's innovative factors is precisely that this training is intended for a group of trainees who are professors in higher education, where requirements are centred on scientific competence in a specific area of knowledge at the expense of pedagogical competences. The fact that this course promotes dynamics of interaction and collaboration between higher education professors based on the development of educational competences for online teaching makes this course truly unique. Some of these dynamics include the e-Portfolio referred to earlier, which made it possible to develop competences related to an active, constructivist, interactive and strongly collaborative learning.

Note that this is the current structure of the course, which has been changed and adapted since its early version consisting of 8 modules, until this latest version, which responds more adequately to the challenges and requirements of a course of this nature (Henriques et al., 2015). The challenge has to do with the activities that will enable the training of pedagogical designers and giving them the means for becoming more efficient in pedagogical design.

As argued by Hasan and Laaser (2010), higher education institutions are faced with needs that fall outside their traditional research, professional development and personal education competences. They must search for options for new audiences to be better prepared to respond to the new reality of our students (connectivity, speed, and space and time facilities) and also to ensure that such a response will help promote lifelong learning, but without compromising the quality of higher education.

These changes have, of course, implications for the professor, whose role now has been redefined and its duties call for the development of more complex professional skills. Chang, Shen and Liu (2014) point to the changes that an online training environment causes to the interactions between professor, student and content, and that professors are expected to take on a more facilitating approach. The teaching activity now consists of planning, resources and communication, and the professor's role is reflected in the teaching, socialisation, management and integration of technologies (Goulão, 2012; Berge, 2001), and should promote the development of strategies that will lead to an active and independent learning process, in networked collaborative and co-learning environments.

It should be noted that in this course these professors take the role of students and that the virtual learning environments promote a more active role of these students while they build their own knowledge. This system is more effective in responding to the specific characteristics of learners, in particular their learning style. This also means that the formal virtual space must be organised in terms of type of learning materials and activities made available, which should be diversified so as to cater for the different learning styles of learners.

The works by Azevedo and Cromley (2004) draw attention to the implications that the pedagogical design of virtual learning environments have in the acquisition of knowledge, and that must also be taken into consideration throughout the course by the students, seeing that they are also professors. The students' opinions are collected in their individual e-portfolio, prepared from the moment they attend the CFDO.

The e-portfolio enhances collaborative, network and lifelong learning. Sá-Chaves (2007) highlights 4 key characteristics of e-portfolios: 1) formative (by grasping the complexity of the training process in a contextualised way, it allows us to understand, in time and context, each part as being of interest to the process); 2) continuous (by grasping the dynamics of how the trainee's personal knowledge increases); 3) reflexive (as the metacognitive reflection generates knowledge to allow the student to act in practical contexts or in contexts about itself); 4) comprehensive (by grasping the evolution of knowledge over time). We also add the focus on sharing and interaction, in particular between peers, creating new learning opportunities, allowing assessments and comments on the work done, which can be an added incentive (Amante, 2011). As Barberà and Ahumada (2007) state, the e-portfolio is a dynamic place where the processes of teaching, assessment and students' personal development converge.

Due to its characteristics, the e-portfolio provides important information for the analysis of the critical issues of quality in online teacher training.

From the aspects shown in most e-portfolios we highlight interactivity and collaboration, as they help to shape the construction of knowledge in virtual environments. These are referred to as being both an advantage and a disadvantage. While the advantages are more obvious, relating to the professional and personal development in a collaborative way, and have a broad theoretical basis (Moreira, Ferreira & Almeida, 2013; Dias, 2008; 2012; Oliveira, Tinoca & Pereira, 2011), the disadvantages relate mainly to the need to adapt to work routines, organisation and construction of knowledge different to those that students are used to – both as students and as professors.

In respect of the analysis and discussion of quality-related issues, an explanation must be given on some of the model's details and on the CFDO quality indicators. The latter is directed to the quality of educational processes, and is assumed to strongly influence the learning outcomes manifested in the desired skills. The purpose is to respond to a continuing need to improve the effectiveness and efficiency of answers, identifying, in due time, the functional weaknesses or the opportunities for innovation, while maintaining a relevant position in the current competitive market of specialised qualifications.

The model used contains process indicators (pedagogical design and others), instruments for collecting and monitoring information (survey questionnaire, information registration grid) and data analysis tools designed for the construction of knowledge, innovation and continuous improvement of quality based on scientific evidence (Henriques et al., 2016). In this phase, we should look at the weaknesses, strengths and opportunities for improvement mentioned by the students in the various spaces and at various moments of interaction.

One of the most relevant weaknesses is the lack of time to do the e-activities, especially when a balance must be achieved between work, family responsibilities and other daily business and the course requirements. Note that the professors responsible for the modules had also stressed the difficulty in meeting the deadlines. This is a central issue in eLearning theory and research (Hasan & Laaser, 2010; Henriques & Seabra, 2012).

Besides the time aspect, another weakness found is that some of the digital tools are difficult to use. Although technologies are always part of our daily life, digital literacy levels are low and some people find it difficult to master the basics of technologies, even more than we would expect in a group formed by higher education professors. This seems to be related with some difficulty in managing individuals with this social profile and highly demanding levels.

Generally speaking, the attitude of classroom professors to online teaching can condition the entire personal and institutional strategy to embrace this form of teaching (McCarthy & Samors, 2009; Martinho & Jorge, 2016). To reduce the negative impact of more antagonist attitudes to distance learning, some authors suggest the development of training actions that associate the pedagogical and technological

components, in order to enable professors to work successfully in virtual teaching contexts and network-based learning (Martinho & Jorge, 2016; Allen & Seaman, 2011; Oncu & Cakir, 2010).

As for the strengths identified by the trainees, the data collected show that the pedagogical design of the course is appropriate and its contents are both innovative and challenging. Interaction and support were also highlighted. The issues referred to by the students reveal a reflexive process associated with professional development (Goulão & Barros, 2014). Some students even defend that all higher education professors should attend the CFDO.

Finally, as regards the opportunities for improvement, we note the issues related to the proper management of time, to a greater concern with the usability of some technologies, and the increased interaction and feedback from peers, and between professor-students. The serious review of opportunities for improvement presented has allowed the introduction of new features to the course under analysis, in particular in terms of structure and pedagogical design, as already mentioned.

These innovations introduced arise from a great deal of reflection on the teaching-learning practices in which professors find support and inspiration, resulting in the creation of knowledge networks and collaborative work, the development of processes that facilitate learning, with implications in the organisational sustainability of the higher education institutions involved.

The focus on innovation involves making learning tools and resources available, creating environments conducive to knowledge, generating new learning partnerships, and anticipating innovative scenarios to generate change. Moreover, we need to continue to experiment, accepting that errors are an opportunity for learning and incorporating the views of the various stakeholders (Collins & Porras, 2002).

We therefore see innovation as the search for critical and creative solutions to solve problems, in order to adapt to the future. Accordingly, innovative knowledge is characterised by being challenging, transformative, practical, an instrument of power, liberating, interpretative, contextualised, reflexive, critical, collaborative, open, interdisciplinary, dynamic, questionable (inter)subjective, and argumentative. To train professors to create online courses and to teach online higher education courses implies developing skills so that they can be critical and reflexive, can question the purpose and contents of teaching and its practice, and produce new knowledge towards pedagogical renewal, in the classroom and in the transformation of his/her peers.

## Conclusions

The online teacher training course is centred on the use of networks for developing learning spaces. To that end, spaces other than the Moodle platform were used for contacts, interaction and socialising. For example, social networks such as Facebook, Twitter or SOL (academic social network created by Universidade Aberta, Portugal). To facilitate the collaboration between students and professors, social web tools and Pedagogy 2.0 were also used to promote collaborative work, in spaces where they could “breathe”, without any barriers and physical or virtual walls. Pedagogy 2.0 is understood as the art or science of teaching using web 2.0 tools and is based on the intersection of three elements: *Participation* in network communities, *Personalisation* of learning experience, and *Productivity* related to knowledge creation (Lee & McLoughlin, 2007).

In short, the results obtained point to some weaknesses related to time management and to the difficulty in using some digital tools. The strengths relate to the pedagogical design of the course, in particular:

- How contents and resources are made available and organised.
- The dynamic and collaborative interactions with the web tools and the virtual environment, mobilized in coordination with the customized Moodle platform of UAb.



- The students' critical authorship based on the learning experience.
- The co-learning work between students and professor, supported by a participatory pedagogy.
- The online communication adapted to end-users from various Portuguese-speaking States and territories.

The dynamic and flexible structure of the CFDO's pedagogical design is open to receive the results of the assessment and research produced in each course edition, as well as the technological and pedagogical innovations and good practices in the field of distance education and network education. By using a sharing and collaborative network, online teaching enriches the virtual communities and the co-authorship processes and, at the same time, provides and adopts unique actions. It therefore allows global and local ties to be established between the participants, fostering innovation in higher education, seen as a number of changes that affect its strategic perspectives.

Despite the current situation of social and economic decline, there is an increasing openness of the national, European and transnational higher education system. At the same time, inequalities are more accentuated. While the experience of creating the European area for higher education is being critically reviewed, it seems difficult to forecast when learning distance education will be regulated in Portugal, in particular higher education. The various national and European university cultures have gradually embraced the idea that the university is a hub in the global network for the production, reproduction and preservation of knowledge, and is not longer an independent centre for the production and dissemination of knowledge (Teixeira, 2012). Against this background, we share the idea put forward by Teixeira (2012) when he defends that networked sharing of resources actually allows the increase of innovation and, consequently, fosters it.

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