


Integrating Digital Technologies in Accounting Preservice Teacher Education: A Case Study in Portugal

Ana Luísa Rodrigues, Instituto de Educação, Universidade de Lisboa, Portugal*

 <https://orcid.org/0000-0001-6648-7956>

ABSTRACT

The importance of developing technological skills at the undergraduate level to form better professionals is no longer questionable, assuming a particular role in subjects as accounting education. However, it appears that technologies are still weakly used in education and training. This article intends to analyse 1) how students' technological skill development can be promoted, 2) in what way the integration of digital technologies in the curriculum is managed, and 3) what influence teaching, assessment, and learning methods have in the development of generic skills, especially technological skills. It presents a case study in the Master's degree in Economics and Accounting Teaching that forms teachers to vocational secondary education in this area. A qualitative approach was used with the support of participant observation and a questionnaire to finalist students. The case study is based on the active teacher training model that promotes technological skills using teaching and assessment methods for active learning.

KEYWORDS

Accounting Education, Active Learning, Assessment, Curriculum, Didactics, Generic Skills, High Education, Preservice Teacher Education, Secondary Education, Teaching, Technological Skills

INTRODUCTION

The accounting literacy plays an increasingly important role in the training of qualified professionals at various areas and levels of education promoting the democratic participation of citizens (Karatzimas, 2020). However, there is still a lack of training at this level, particularly in Portugal. Hence the importance of studying this issue at the various levels of education and also with regard to teacher education (OECD, 2020; Rodrigues, 2020).

In accounting education, in addition to issues associated with values and ethics, it is also important to analyse issues related to generic skills, which include technological skills. Assuming that technical and scientific knowledge of accounting is ensured with rigour and quality, these skills complement the knowledge required by employers, which often not being adequately taught in accounting degree programs (Jackling & De Lange, 2009).

Following the COVID-19 pandemic, the importance of technological skills in education was further emphasised. As conventional schooling was interrupted by nation-wide school closures in most Organization for Economic Cooperation and Development (OECD) and partner countries. The impact on students that have had to rely on their own resources to continue learning remotely and in teachers to adapt to new pedagogical concepts and modes of teaching delivery, was significant (OECD,

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*Corresponding Author

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2020). Despite the negative impact of COVID-19 in several aspects in accounting Education, this may have been positive in creating opportunities to realign different learning and teaching strategies from traditional formats (Sangster et al., 2020).

Nowadays, the development of generic skills and the integration of technologies are an unavoidable reality both in education and organizations, and society in general (OECD, 2018). This technological transformation is required in the job market, for future accounting professionals, and should start in their education and training, and also in the education of preservice teachers.

In this sense, this study aims to analyse how the development of students' technological skills can be promoted through active teaching, assessment and learning methods, with the integration of digital technologies in the curriculum.

In addition to the literature review, a qualitative approach was used, supported by a case study, developed between 2017 and 2020 on a preservice teacher education program in Economics and Accounting in Portugal. The case study used was complemented with participant observation using a field diary and a questionnaire of finalist students performed in July 2020 (after the schools closed due to the COVID-19 pandemic) as data collection instruments.

Therefore, the objectives of this study are to analyse i) how the construction and development of students' technological skills are promoted, ii) in what way the integration of digital technologies in the curriculum is planned and managed, and iii) what influence the teaching, assessment and learning methods have, on the development of generic skills, especially technological skills.

In this empirical study, the International Education Standards for Professional Accountants were considered (International Education Standards, 2019) and it was based on the Active Teacher Training (ATT), in which the use of learner-centred teaching methods allows the development of students' generic skills (Rodrigues, 2020).

DEVELOPMENT OF GENERIC AND TECHNOLOGICAL SKILLS IN ACCOUNTING EDUCATION

The Accounting Education Field Accounting Education is a field of study that is still underdeveloped, with relatively few teachers with training in the pedagogical area and few publications in papers. There is some weakness in the available research, with gaps not covered in research, mainly in Portugal (Rodrigues, 2019).

According to the literature review carried out by Apostolou et al. (2013), there is a tendency to study unique cases with valid results only in this case, making it difficult to generalise the results. The importance of developing research about associated professional skills was mentioned, as well as critical thinking, for example, both in terms of the best ways to teach or learn these skills, and in relation to how these skills should be acquired or honed. The value of practical experiences and opportunities to interact with professionals was also confirmed, namely through professional internships, which are relevant to the construction and development of skills.

At this point, they highlighted the fact that students' learning can take place inside and outside the classroom, given the relevance assumed today by technologies and distance learning. Was also included the possibility of online learning assessment and the consistent study of the interaction between curriculum, technology, incentives for teachers and student motivation. As such, it will be essential to analyse how online teaching can affect and maximise learning and how the evolution of technology can lead accounting teachers to create better online content and identify the most appropriate ones.

In the subsequent literature review, Apostolou et al. (2015) recommend a review of the curricula, proposing the crossing with interdisciplinary or technical knowledge areas with development of skills and, also, that the technologies and online teaching are more exploited by accounting teachers using teaching-learning methods and the construction of more innovative teaching models.

The latest literature review published by Apostolou et al. (2020) reaffirms the importance of developing research in accounting education, which presents a summary and critique of some empirical articles. They suggest that descriptive articles should explore new issues and best practices, and that empirical articles, may seek to identify and isolate variables of interest within a theoretical construct, while proposing resources for launching ideas and developing projects.

Sangster et al. (2020) expect “that Accounting Education will publish many research papers in the months and years ahead that will empirically examine many issues related to the COVID-19 pandemic” (p. 432) following the significant experiences lived and the importance they may represent in the future for a change in pedagogical practices in higher education.

Developing Generic and Technological Skills

In the literature review conducted, due to the reduced number of studies found, it was decided to focus on the studies referring to the skills development and learner-centred teaching methods in accounting education context.

However, several summaries of empirical articles presented by Apostolou et al. (2020) detailed core competencies and instructional approaches. We can also find syntheses of several studies on the development of generic skills, namely, social, communicate, writing, teamwork and collaborative skills, and technological skills, using game-based learning, serious games, or an online course. Active learning-based methods such as project-based learning, experiential education or storytelling were used in the studies too. Other studies in different countries have focused on the development of generic skills in accounting education.

Thus, the perceptions of university accounting students about the importance of developing generic skills, in Saudi Arabia, were analysed by Al Mallak et al. (2020). The results showed that students consider them important, especially ethical skills, and that the accounting education system could do more to provide students with opportunities to develop generic skills.

Other research, developed at Libyan University, about knowledge and skills required from accounting education and barriers to development, shows accounting education programs divided into three areas: technical knowledge, generic skills (such as teamwork, reading with understanding, and analysis skills) and technological skills. It was concluded that most stakeholders were not satisfied with the development of level of students’ competencies and the educators consider the gap between the required skills and development level in their students even larger than that perceived by professionals and practitioners (Mosbah, 2018).

Furthermore, a study on generic skills in an undergraduate degree contextualised in Sri Lanka, Abayadeera and Watty (2016) verified that most of the generic skills in addition to technical skills are important for the success of the graduates’ careers. Considering the interviewed students, generic skills are important and are not developed properly during the course. The results of the study point to the importance of redesigning the accounting curriculum to include generic skills, with the establishment of strong links between universities, accounting institutions and companies and with the introduction of participatory methods of curriculum design.

About integrating technology and data analytic skills into the accounting curriculum, Andiola et al. (2020) analysed the results of AACSB (American Association to Advance Collegiate Schools of Business) accredited accounting department leaders concerning their experiences. The biggest challenges to implementation were shortages of appropriate faculty and funding, and it was discussed whether it would be better to hire new teachers with these skills or to train current teachers. The rewards structure/incentives for faculty to take such initiatives to encourage excellence in the classroom must also be considered. For example, one could consider developing online trainings or webinars accessible at a lower cost to teachers or offering a specific course on data analytics to students at undergraduate level.

One suggested avenues for research is to investigate approaches to developing technological skills of faculty members, given the difficulty in hiring already-trained faculty in this area (Andiola et al.,

2020), bearing in mind that the ability to integrate digital technologies will be a determining skill in teacher education (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2008).

Regarding the development of learner-centred teaching methods using participative approaches in accounting education, the possibilities referred to in the International Education Standards for Professional Accountants to be considered, include:

- (a) Role playing; (b) Discussion of selected readings and online materials; (c) Analysis of case studies that involve business situations involving ethical dilemmas; (d) Discussion of disciplinary pronouncements and findings; (e) Seminars using speakers with experience of corporate or professional decision making; and (f) Use of online forums and discussion boards. (IES, 2019, p.62)

Mihălţan (2020) built upon the hypothesis that certain teaching methods used by teachers can help the student better acquire practical skills in accounting. The author noted that teaching methods are among the factors that influence the learning process of students and constitute an instrument for the development of practical skills. These are a result of the learning process and are important for both teachers and students. The most used methods to form accounting skills identified in this study and specialised literature were case studies, exemplification, exercise, demonstration, practical training using accounting software and problem-based learning.

In a systematic review of the literature on the benefits of Experiential Learning Activities (ELAs) in accounting education in Australia, several types of ELAs were found, in which the most researched included: case studies, real cases and simulations. The other types mentioned were computer simulations, field trips, work placements, role plays, laboratories/practices, communities of practice and educational games. The most search benefits found were categorised into technical knowledge and comprehension; student attitude and satisfaction; and authentic application of theory, transferable skills, and real-world awareness. It has been considered that ELAs are a way to develop professional and generic skills (Gittings et al., 2020).

There were two studies on case studies, one of the most cited methods, also called the case method, which promotes active learning suitable for the development of generic skills, namely communication skills, critical thinking and problem solving. Boyce et al. (2001) consider that accounting educators should take responsibility for the development of students' generic skills in conjunction with discipline-specific skills, and that the typical learning styles are not suited to the acquisition of generic skills. However, they found that the biggest problem in the implementation of case studies is related to the teacher's resistance to the implementation of this strategy, so a concerted effort is required to promote its use.

Considering the existence of advantages of using the case method, Soares et al. (2019) found that students have a good acceptance in relation to this method, although at first there is also resistance from some students. Regarding the advantages, it was reported that the method makes it possible to view matters in a more holistic way, in addition to facilitating the approximation between theory and professional practice. It also improves students' active participation in discussions, improving their ability to expose and confront ideas.

In this sense, one of the key factors identified was the need for pedagogical training of the faculty, considering the importance of developing generic and technological skills in students, alongside accounting technical and scientific knowledge, and the relevance of using learner-centred teaching methods.

The Active Teacher Training Model

In order to promote, both technological and other generic skills, the Active Teacher Training (ATT) model was used in case study. This recommends a flexible planning and content management of

the training process using active learning and learner-centred teaching methods, which enhances the construction and development of teachers' skills, and simultaneously, through an isomorphism process, the transfer of skills from teachers to their students, future teachers (Rodrigues, 2020).

Table 1 shows the structuring principles of ATT that recommend that teacher education takes place in an authentic social context with pedagogical integration of digital technologies and focused on skills. Active learning in synergy with digital technologies should be used, supported by collaborative and cooperative teamwork.

Table 1. Structuring Principles of Active Teacher Training (ATT) Model

Structuring Principles of ATT Model
Principle 1 Cross-curricular training with integration into teaching of digital technologies in an authentic social context that supports human development.
Principle 2 Training tailored to the needs and interests of trainees, differentiated, and focused on skills, with flexible planning and content management.
Principle 3 Training based on a democratic and affective pedagogical relationship, with the trainer as a guide, for the critical and isomorphic reproduction of skills for students.
Principle 4 Dynamic theoretical-practical training, supported by collaborative and cooperative work in a learning community, using active teaching methods and strategies in synergy with digital technologies.
Principle 5 Training for construction and development of skills of thinking reflectively, acting autonomously, network communication, participatory evaluation, and self-regulation, to create a community of practice that allows the social construction of self-knowledge.

Source: Rodrigues (2020, p.27)

As ATT is considered a privileged model for the construction and development of generic skills, specifically reflectiveness, autonomy, network communication, participatory assessment and self-regulation, a predominantly formative assessment was used. This model also considers important the cross-curricular training and the creation of a community of practice that allows the social construction of self-knowledge and may be relevant for further in-service teacher education and lifelong learning.

References to the expression *teaching, assessment and learning process* are based on the importance of integrating the three concepts as necessarily interconnected processes. Associated with the concept of formative assessment for learning (Black, 2003), it seeks to develop an articulation and integration of the learning, assessment, and teaching processes (Fernandes, 2016), considering that the formative assessment process constitutes an essential and integral part of the teaching-learning process.

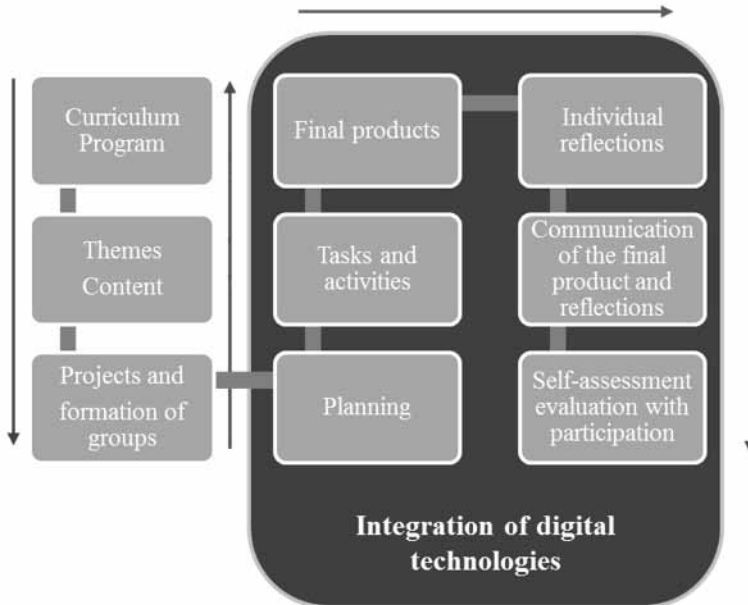
ATT model can be used for a particular content or thematic unit, in a training module or for the whole training period or school year. This method starts from the curriculum or program of the discipline. First the subjects and contents of work are presented to the preservice teachers, groups are formed, and the thematic areas are distributed.

Work should be in the form of a project (see Figure 1) or using another active teaching-learning strategy, such as using the flipped classroom method and b-learning (online and face-to-face teaching), using a Learning Management Systems (LMS).

In work project, after negotiating the specific projects, each group will begin to plan the work, distributing and organizing individual tasks. During practice and while doing the projects, support and guidance is provided by the teachers to each group. Autonomous, non-face-to-face work should

be planned and monitored through online teaching using digital technology as a tool to support learning and communication. It must be carried out throughout the formative evaluation process in a continuous format with feedback, and individual reflections and online communication must be promoted, with repercussions on the final summative evaluation, including self-assessment and participatory evaluation, as a way of joint reflection.

Figure 1. Method of Active Teacher Training (ATT) Model



Source: Rodrigues (2020, p.28)

So, in Accounting Didactics, according to its objectives in terms of the development of generic skills, the integration of technologies was strongly promoted by the teacher, through their own use with the preservice teachers and by encouraging the teachers to integrate them with their students in Professional Practice Initiation disciplines, using the ATT model.

Rodrigues et al. (2018), in a study carried out in the subjects of Economics Didactics and Accounting Didactics, based on the Active Teacher Training (ATT) model (Rodrigues, 2020), analysed how the use of active teaching-learning methods promotes construction and development of skills. The activities developed included the flipped classroom, classroom simulations and the presentation by students. A Learning Management System (LMS) was also used to communicate and carry out synchronous sessions online. They concluded that the use of these methods boosted the use of technologies and the development of skills, especially technological, associated at the same time, with technical and pedagogical knowledge that it was possible to develop.

In short, based on the literature, it appears that it is important to produce more research in accounting education, in several lines of study, on integration of digital technologies, teaching and learning methods, assessment of learning, curriculum development and content, creation of didactic resources, and professional development for teachers (Rodrigues, 2019), as well as foreseeing ways of continuing professional development for faculty.

METHOD

This study used a qualitative approach, supported in a case study, of the classes taught in the master's Degree in Teaching Economics and Accounting, in Portugal.

The case study methodology was considered appropriate for this study, to the extent that it was intended to describe and analyse situations and contexts (Yin, 1994) and study a specific situation through a particular case, from an inductive and holistic perspective of the phenomenon (Patton, 1990) and an interpretative perspective of reality (Walsham, 1995), focusing on the analysis of processes rather than outcomes (Bogdan & Biklen, 1994). Taking into account the framing context of the social sciences, in which the researcher was faced with complex situations and being difficult to select variables, it was decided to describe and analyse a phenomenon and its interactions (Yin, 1994), in order to provide more knowledge about the phenomenon studied and support or object about the effects and relationships found (Guba & Lincoln, 1994).

The case study, considering that a case, according to Yin (1994), corresponds to a unit of analysis valid as a research object, in which the participant observation technique was used. In this empirical study, we searched consistently to present the greatest accuracy in information (Bogdan & Biklen, 2006), through systematic recording of observations and reflections in notes and reports compiled in a field diary, taking advantage of the fact that the researcher is simultaneously the teacher and therefore able to observe events at all times according to Bell (2005), that is, "the researcher was used as a research tool" and data collection (Yin, 2011, p.122).

In a qualitative and naturalist paradigm, reality is seen as multiple, intangible, divergent, and holistic, with a strong interrelation between researcher and participants, with hypotheses and statements related to a certain context and patterns of interactive attributes (Lincoln & Guba, 1985). These social constructions are then interpreted and compared through a dialectical exchange, with the aid of the triangulation of instruments which allows an increased validity of the data (Bell, 2005) and with precautions in terms of ethics and respect for the Ethical Guidelines for Educational Research (BERA, 2018).

As such, the main instruments of data collection, in Accounting Didactics discipline, after the elaboration of the learning scenario (medium term planning) based on the respective curriculum sheet and weekly plan (short term planning), were: the field diary derived from participant observation, with photographic and video records; the works developed by the students; an observation grid where notes regarding the presentations made by the students were recorded; and the application of a final questionnaire to students.

In the data analysis, a content analysis process was used in the field diary, following Bardin (2011), using verification strategies, as an attitude of permanent questioning and self-responsibility (Miles & Huberman, 1994). In the exploration of the material, the texts were categorised and coded, to later perform the treatment of the results, the inference or induction and the interpretation of the data (Bardin, 2011), to be able to organise the information and analyse regularities (Miles & Huberman, 1994).

The questionnaire is also an important data collection tool in qualitative studies (Johnson & Christensen, 2004), which fulfils the steps of descriptive statistics, from the identification of situations and critical review to the analysis and interpretation of results. In this case, the questionnaire intends only to characterise the participants of the case study, not having the intention of any kind of generalisation or statistical inference.

Case Study in Preservice Teacher Education

This case study was developed in Accounting Didactics of the master's degree in Teaching Economics and Accounting, the only available course in Economics and Accounting preservice teacher education at secondary level, in Portugal.

According to the legislation in force in Portugal, to exercise the teaching profession in secondary education it is necessary to have a master's degree, and to have access to this master's degree it is mandatory to have a degree with at least 120 credits/ECTS (European Credit Transfer System) in the specific teaching area.

This master's degree, also with 120 ECTS, is presented as a complement to a degree in Economics, Management or Accounting and aims to reinforce and deepen the initial scientific training, focusing on the knowledge needed for teaching in specific scientific areas. The only institution in Portugal that gives a master's degree in Teaching of Economics and Accounting is the University of Lisbon, at the Institute of Education¹.

The subjects in the accounting area of secondary education are only taught in the Professional Courses at Vocational Education and Training, in Portugal, integrated in the component of technical training, with their contents framed in structured modules, in various professional courses, namely: Accounting Technician; Management Technician; or Banking and Insurance Technician. The most common specific subjects are Accounting; General and Analytical Accounting; Taxation; and Financial Calculation. In Portugal, there are currently around 2000 teachers working in public and private schools of secondary education in Economics and Accounting².

The participants were students from the classes of the last two academic years, 2017/18 and 2019/20, the first consisting of 7 students and the second comprising 19, for a total of 26 students. It was a convenience sample and is not intended to be representative of the population.

Of the total number of participants, 11 were male and 15 female, with an average age of 42 years old. This average in a class of preservice teacher education is justified because there had been no teacher education program in this area for several years and many had professional experience without any pedagogical professional qualification.

This study was part of the *Technology Enhanced Learning at Future Teacher Education Lab Project*³, that was under development in the master's in teaching of several subject areas at the University of Lisbon. This assumed that teacher education programs enriched with technology can add value to the quality of preservice teacher education and their teaching practices. It aimed to seek answers to the question of how the technology available in learning spaces offers opportunities to create innovative ways of designing teacher education, and to create resources for teacher education in several areas, including that of Economics and Accounting.

Accounting Didactics Discipline Management

The Accounting Didactics discipline is one of the central subjects of the master's Degree in Teaching Economics and Accounting, not having a main objective the teaching of technical and scientific contents of accounting, but at the pedagogical level, of accounting teaching. Therefore, the construction and development of generic skills, considered essential for the teacher training in the Accounting, are contemplated in the objectives of this discipline.

Accounting Didactics started out being planned in a perspective of a learning scenario with the development of seminars and a synchronous online session. A learning scenario is something that the teacher does in his teaching practice if it is considered that when planning his daily pedagogical practice, the teacher designs or anticipates, in a conscious way, different types of situations that he will try to create in his classroom. The scenario design depends on several factors: the context in which the learning takes place, the knowledge, and skills that you want your students to acquire, the methods and strategies that you can adopt, the motivations for learning you want to trigger, the resources that exist in the classroom and in other areas of the school, the tools it makes available to students, and the evaluation model it adopts (Matos, 2014).

Thus, we intend to use active teaching methods, predominantly formative, which may include: analysis and discussion of texts, articles and themes of the program; the construction of learning scenarios for a didactic unit; the development of teaching materials, resources and instruments; the simulation of teaching-learning situations with participatory evaluation; case analysis and critical

reflection on professional practice, focusing on the use of digital technologies in the teaching, assessment and learning process.

Considering its inclusion in the Technology Enhanced Learning at Future Teacher Education Lab project, the integration of digital technologies was promoted, with the use of the FTETLab room enriched with technology, inspired by the Future Classroom Lab (FCL)⁴ created by European Schoolnet, as the discipline's classroom. This is a room equipped and reconfigurable to rethink the role of pedagogy, technology, and design in classrooms, which aims to provide different learning styles, more personalised and interaction to an active learning.

In the seminars, an intensive use of the interactive whiteboard was carried out and the remaining digital equipment was tested, using active learning, namely classroom simulations and analysis of real experiences, combining technology, content, and pedagogy. It was also privileging online education as a complement, with the use of a LMS (Learning Management System), in terms of the availability of didactic materials as a tool for interaction and communication.

Data Collected through Participant Observation

In this empirical study, the International Education Standards for Professional Accountants were considered, regarding the teaching methods and participative approaches suggested, namely, with the proposal for the analysis of case studies or practice role playing (International Education Standards, 2019, p.62).

The focus of the observation was on the following generic skills: communication, critical thinking, problem solving and, especially, technological skills. Based on the competency-based educational framework of Lawson et al. (2014), that include: accounting, broad management, and foundational competencies, as communication, technology, analytical thinking and problem-solving.

Through participant observation technique the data collected was compiled and recorded in the field diary and observation grid. Regarding the works developed by preservice teachers, the planning of the discipline carried out from a perspective of the learning scenario is also relevant, with activities involving the use of digital technologies for communication, integrated in the teaching, assessment and learning process.

The study was based on the ATT model, in which the use of learner-centred teaching methods allows the development of students' generic skills, according to Rodrigues (2020), sustained, for example, in Arends (2012). It presents several strategies of the cooperative learning environment as one of the best forms of learning, which provides the development of generic skills and produces academic and social benefits, founded on a democratic classroom, intergroup relationships and learning through experience.

Thus, in seminars, group presentations were made by preservice teachers of scientific articles in Accounting Didactics, using the flipped classroom method. They built learning scenarios with accounting content, with the respective didactic resources and the assessment instruments. As well as, performed simulations of parts of classes, with the consequent reflection and critical self-analysis on them. A seminar was also held with a guest, a former student of this master's course with experience in accounting, to update technical and scientific knowledge. A synchronous chat session was also developed with a text analysis and debate about mobile technologies in class and project-based learning.

For this synchronous session, after early availability by email of the respective work agenda and text for the discussion, a guide for the session was prepared by the teacher, with a set of questions and statements, to make the session more fluid and facilitate the speed of the teacher's written response in the chat during the online discussion.

In classes in synchronous sessions, it is essential to prepare them in advance so that during their development it is possible to have an effective time management and a good level of student participation. Having a script with questions and answers previously prepared will be a condition for these classes to run in the best way.

The teaching-learning strategy of class simulation is emphasised as a privileged form of skills development. In these simulations specific accounting contents are assigned to each student, who must present them to the class, thereby simulating a lesson. At the end of the presentation a joint debate is held in which the strengths and weaknesses of the preservice teachers are analysed. These moments of reflection and self-evaluation are very relevant in didactic curricular units.

In works developed by preservice teachers, they suggested the use of diversified digital applications and resources, specifically: the presentation of concepts using slides in PowerPoint or Prezi; the use of the interactive whiteboard and computers with an internet connection; the Kahoot application, for diagnostic assessment or introduction of classes; a closed group on Facebook or a shared cloud for making materials available; the creation of concept maps as an instrument for systematizing the contents (through applications, such as ClassFlow, CmapTools or Mindmeister); practical cases or case studies to be worked in group. Google Classroom, WorkFlowy and Team-up applications were proposed for teamwork and for sharing results and class discussion, also the Padlet.

In terms of the assessment questions, the effects of the implementation of the ATT model were observed, regarding its incorporation in the teaching and learning process, with the presence of a strong component of formative assessment, enhanced using digital resources that allowed obtain feedback as soon as the task/work is completed, facilitating learning self-regulation and group dynamics assessment.

Questionnaire Applied to Students

This study included a questionnaire, collection, and respective content analysis. The questionnaire had 15 closed-ended and 6 open-ended questions. This was aimed at the professional characterization of the preservice teachers and their perception of the evaluation of the master's Degree in general and their technological skills, given their increased importance today. 17 valid responses were obtained, with a response rate of 65.4%.

The validity and reliability in the elaboration process of questionnaire were ensured by being very rigorous regarding the collected data, the explanation of sampling, the use of standardised recording methods, and the care in the appropriate statistical treatment of data (Cohen et al., 2007; Hill & Hill, 2009).

The preservice teachers gave their informed consent, guaranteeing anonymity and confidentiality, with the dissemination of results only for the purpose of research work and improving the quality of the course.

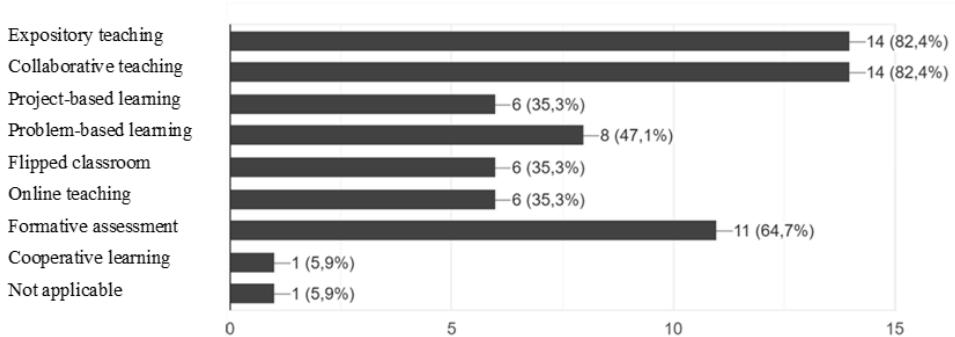
The vast majority of respondents have some professional experience. Only 29.4% have no teaching experience, 23.5% of them have less than 5 years of professional experience, 23.5% have less than 10 years and the same percentage have between 10 and 13 years of professional experience in teaching, although some have experience in other areas.

In 2020, 47.1% of respondents are already working as teachers or trainers, 11.8% in other areas of education, 29.4% have professional activity in other sectors and 11.8% have no professional activity. 64.7% work full time. Only one respondent replied that he did not intend to perform functions in education in the next academic year, with all the others wanting to be teachers.

Regarding the degree of satisfaction with this master's in general, as well as, in the Didactics disciplines (Figure 1), on a scale of 0 to 10, most responses are closer to Very Satisfied (88.2% of the results between 6 to 10) than from Nothing satisfied (5.9% with a score of 3 and 5).

In relation to strengths of the master's degree, considering the different disciplines, in the open response, the preservice teachers made some references to theoretical knowledge and content in the area of pedagogy, within the faculty, to the development of skills resulting from the new teaching methods and also to methods used, such as, simulated practices, autonomous work and teamwork. Regarding weaknesses, excessive hours were mentioned, a greater weight of theory compared to practice, a deficit in the specific technical-scientific area and little presence of digital technologies. In the case of technologies, they would presumably be referring to other disciplines than Accounting Didactics.

Figure 2. Degree of satisfaction with Didactics subjects

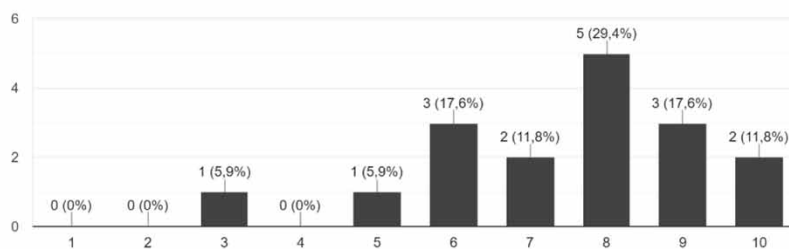


Throughout this master's degree, respondents consider that they acquired knowledge and developed skills to use with their future students, especially with the following teaching methods (in Figure 2): Expository teaching (82.4%), Collaborative teaching (82.4%), Formative assessment for learning (64.7%), Problem-based learning (47.1%), Project-based learning (35.3%), Flipped classroom (35.3%) and Online teaching (35.3%).

In the future with their students, most preservice teachers plan to use active teaching methods more frequently and also the expository teaching, having mentioned in particular the use of collaborative teaching, formative assessment, project-based learning, teamwork, problem-based learning and flipped classroom.

To the question *Do you think you have improved your technological skills?* most respondents reply positively, except three of these, according to Figure 3.

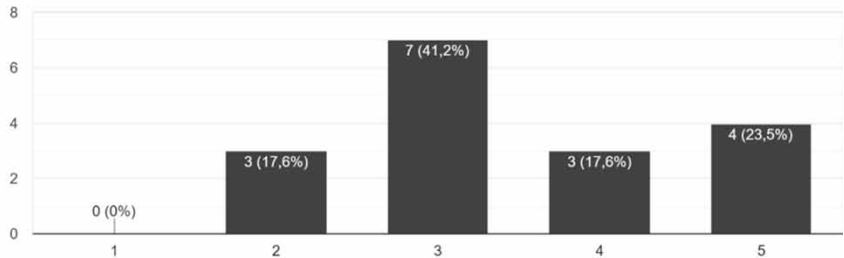
Figure 3. Feels competence to use teaching methods



When asked if *Do you feel prepared to use digital technologies in class with students?* (Figure 4) the vast majority of respondents answered affirmatively, with the exception of two, who might eventually have greater difficulty with the use of digital technologies or resistance to their use.

However, all respondents report that in the future they will easily be able to take classes online through an LMS (such as Microsoft Teams) or video conferencing (using Zoom, for example). They mentioned that the main difficulties will be the lack of equipment and access to technology for some students, technical problems, interaction, motivation, and proximity to students, monitoring of students with learning difficulties, assessment of learning and adaptation of resources to online platforms.

Figure 4. Perception of technological skills improvement level



They were also asked about the technologies or applications they plan to use in the future with students in distance learning (Figure 5), having mentioned above all that they intend to use video conference (94.1%), LMS (88.2%), email (88.2%) and social networks (52.9%), such as Facebook or WhatsApp.

All respondents considered that the master's degree in Teaching Economics and Accounting contributed or may contribute to their professional future, having added that, in addition to professional qualification, it allowed them to acquire knowledge mainly in the didactic and pedagogical area and the construction and development skills, specifically technological.

Nevertheless, in the final suggestions requested, there are some references to the need for more technical-scientific content and practice in the use of APA (American Psychological Association) Standards, analysis of more real and practical cases and greater presence of online classes.

Figure 5. Confidence in the use of digital technologies in class with students

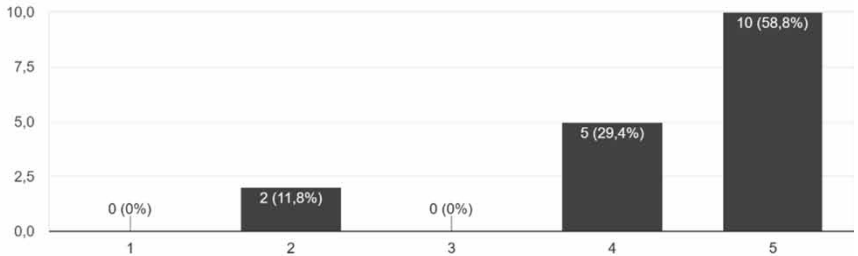
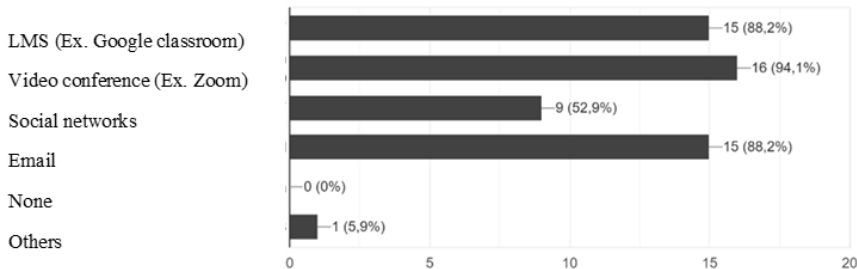


Figure 6. Confidence in the use of digital technologies in class with students



RESULTS

The results presented and analysed in this study were based on the data collected, through participant observation about work done by the students and their perception of the master's, and technological skills developed, through the questionnaire.

In the analysis and interpretation of all the data collected, it was possible to confirm, in addition to learning the course specific contents, the construction and development of diverse skills, particularly technological and communication skills, critical thinking and self-regulation.

The implemented planning in classes was found to be adequate and to promote skills in question, and it allowed us to observe that the master's students used the instrument of learning scenarios with the integration of technologies in their planning work of future and hypothetical classes with their students in the disciplines of the accounting area. It was also possible to verify that the formative assessment allowed preservice teachers to register the evolution of cognitive learning, but also technological skills and collaborative work.

The implementation of this training model also allowed us to verify the social construction of self-knowledge and the isomorphic reproduction of skills of preservice teachers with their students. This fact was possible to verify due to the teacher of the Accounting Didactics also being a teacher of Initiation to Professional Practice I, II, III and IV disciplines, one in each semester, which allows a coordinated articulation of the contents and objectives of this disciplines in the master's Degree in Teaching Economics and Accounting.

Regarding the questionnaire applied to students, it allowed us to verify that these preservice teachers already had some professional experience in teaching and that in general they had a good degree of satisfaction with this master's degree and the Didactics disciplines, considering that this allowed them to acquire knowledge in the didactic and pedagogical areas, and to develop skills, particularly technological.

The most mentioned active methods, which they consider that developed skills most effectively were: Collaborative teaching (82.4%), Formative assessment for learning (64.7%), Problem-based learning (47.1%), Project-based learning (35.3%), Flipped classroom (35.3%) and Online teaching (35.3%). The technologies they intend to use in the future with students in distance learning will be video conference (94.1%), LMS (88.2%), email (88.2%) and social networks (52.9%), like Facebook or WhatsApp.

Although the vast majority consider themselves competent to use several active methods and digital technologies, few students still feel little confidence in the development of these student-centred methods and has not sufficiently developed their level of technological skills.

However, since all respondents report that they will easily be able to take classes online through a LMS or Zoom platform in the future, their response and perception will also possibly be related to the difficulties they expect to encounter, namely: in interaction with students and in the assessment of learning, due to both the lack of access to technology by some students and to possible technical problems arising from its use.

Taking up the objectives of this study, it was possible to verify i) the construction and development of students' technological skills through the active methodologies effectively experimented, ii) with the integration of digital technologies in the curriculum in a planned way with the support of the ATT model, and iii) that teaching, assessment and learning methods influenced the development of generic skills, especially technological skills.

In view of the suggestions made by the preservice teachers related to the Accounting Didactics discipline, it will be important to reflect on the need for an increase in weight of technical-scientific contents of economics and accounting, the analysis of real and practical cases and online teaching as a complement to classroom teaching.

DISCUSSION

In any teaching program, the learning objectives must include the specific technical and scientific knowledge of the discipline and the generic skills that are important to develop, which may be more valued in some disciplines than others, as permitted by the characteristics of the technical-scientific content.

However, considering technical competence crucial, these do not necessarily have to exclude or overlap in relation to generic skills, as they can be developed simultaneously through teaching methods that provide their development at the expense of teacher-centred methods.

On the other hand, while it is possible to teach ethics, for example. It is not possible to teach students how to be ethical or act ethically. It is possible to teach students how to communicate, but it is not possible to teach them how to communicate without experiencing communication. Generic skills are not learned theoretically, but in practice they are learned by doing (Dewey, 1960; Kolb & Kolb, 2005) and, in this way, it is possible to promote their development.

The same happens with technological skills, in so far as it will be important to offer students activities with pedagogical resources where digital technologies are effectively used, as it is through using and experiencing them that they can develop the skills, following the Active Teacher Training model.

In the educational context, generic skills can be more easily developed with the promotion of active learning, using learner-centred teaching methods, and with the integration of digital technologies in the teaching of accounting, through case studies, role playing, project-based learning or problem-based learning. These require the use of collaborative and teamwork and the need for oral and written communication and problem solving, not forgetting online teaching, where you can include the flipped classroom, as a complement to classroom teaching.

In this study, there was an effective increase in the level of technological skills of the future teachers, through technologies wide use and experimentation, associated with innovative methods with integration of technologies in the teaching, assessment and learning process. However, although this program ensures a preservice teacher education to secondary education in Portugal, there is a need for ongoing training for current teachers, on the one hand, and pedagogical training for higher education teachers, on the other, in a perspective of Continuing Professional Development (CPD).

According to the International Education Standards (IES, 2019), the CPD must include “learning and development activities that are relevant to the roles of professional accountants, such as: (a) education, (b) training, (c) practical experience, (d) mentoring and coaching, (e) networking, (f) observation, feedback, and reflective activities, and (g) self-development activities”.

Some initiatives that can be developed within in-service teacher education are also suggested, highlighting the following: undertaking educational programs or e-learning courses, conferences, and seminars; reflecting on practical experiences and developing personal development plans; and receiving on-the-job training, performance feedback, or professional development guidance from a mentor or coach.

Maloy et al. (2005) propose the use of coaching with pedagogical integration of digital technologies so that teachers can try new approaches and make them part of their pedagogical methods.

Thus, with regard to the theoretical implications of this study, it was possible to confirm the need and relevance of the development of soft skills by students and, particularly, of technological skills by teachers, as Andiola et al. (2020) also identify in the literature. To this end, it is important to use active, student-centred teaching and learning methodologies that enable the development of skills and the construction of knowledge by students. Several teaching-learning methodologies integrating digital technologies are also addressed in the literature, being found to contribute to skills construction and development.

As for the practical implications, it will be necessary to continue the reflection on how to develop skills through active methodologies in preservice and in-service teacher education, which can be

developed with the support of the Active Teacher Training model and the promotion of teaching and learning strategies for active learning enriched with technology.

Regarding the new challenges post-Covid-19 in hybrid education different formats of online and classroom teaching may arise, “many saw evidence of the benefits of elements of blended and online delivery” (Sangster, 2020, p.436) which vary however with the availability of technologies and socio-economic context. In this study with contributions from accounting faculty located in 45 countries, it concludes that “global differences in accounting education tell us that there is no global solution” (p.449) and that it is necessary to examine empirically a range of related issues:

- Students’ preferences for, and satisfaction with, different forms of blended and online learning (synchronous/asynchronous; video -v- voiced-over presentations, discussion boards, etc.).
- Impact of different delivery modes on student engagement and alienation (behavioural, cognitive, affective, social, etc.).
- Impact of different delivery modes on student performance and achievement (grades, higher order learning, critical thinking, etc.).
- Examining ways to engender good study skills, especially the self-efficacy, self-reliance and time management skills that are so important in more blended or online learning environments.
- Examining ways to develop professional skills (oral communication, negotiation skills, team-working, creativity) in an online or blended model.
- Building learning communities among students in blended and online environments.
- Exploring ways to provide pastoral/social care to accounting students.
- The preparedness of accounting faculty for good online or blended instructional design.
- Investigating the efficacy of teaching practices and behaviours under blended/online/hybrid models.
- Team-teaching and collaboration, and how this is facilitated in online and blended courses.
- Action learning research concerning various dimensions of instructional design. (Sangster, 2020, p.445)

Therefore, a set of variables have to be put in place in order to think about the future in a new paradigm that allows us to take and emphasise the positive aspects and make up for the less positive ones that the emergency remote education brought us with the pandemic.

CONCLUSION

In this research, we can conclude that the active training model, which is developed, with the use of active methodologies and integration of digital technologies in the curriculum, organised according to the needs of teachers, can contribute to their professional development. Considering that time is required for learning with technologies and that changes in what is taught and how it is taught can be slow.

The results obtained in this empirical study allowed us to observe the relevance of students’ technological skills development, as well as, generic skills, namely communication skills, teamwork, critical thinking, and problem solving, with active teaching-learning methods combined. The development of skills is a key factor for the future of these professionals and will contribute to their better performance in schools and organizations.

The relevance of autonomy is highlighted as a key competence, as a good teacher should “making himself or herself unnecessary, empowering learners to learn without the teacher’s help” (Labaree, 2000, p.233). Teacher educators with their own expertise should empower future teachers to carry on the practice of teaching without the need for continuous consultation and chronic dependence, promoting their capacity and independence.

This way, it is necessary to support teachers through specific continuous training in the sense that they can, in addition to updating their technical and scientific knowledge, innovate in their

practices at the pedagogical level and build and develop generic and technological skills. This issue, in addition to the importance it assumes for these teachers, can influence students and their future, as accounting professionals, as it will allow them to perform better in organizations, emphasizing the demand of the labour market at the level of skill development face the emerging technological transformation in society (OECD, 2018).

In conclusion, the development of more research in accounting Education will be important for the consolidation of this field of study. It is suggested that more extensive, descriptive, and empirical studies are carried out, which explore best practices and variables of interest, specifically on the integration of digital technologies, active learning and using learner-centred teaching methods, assessment of learning and continuing professional development for faculty.

REFERENCES

- Abayadeera, N., & Watty, K. (2016). Generic skills in accounting education in a developing country: Exploratory evidence from Sri Lanka. *Asian Review of Accounting*, 24(2). Advance online publication. doi:10.1108/ARA-03-2014-0039
- Al Mallak, M. A., Tan, L. M., & Laswad, F. (2020). Generic skills in accounting education in Saudi Arabia: Students' perceptions. *Asian Review of Accounting*, 28(3), 395–421. doi:10.1108/ARA-02-2019-0044
- Andiola, L. M., Masters, E., & Norman, C. (2020). Integrating technology and data analytic skills into the accounting curriculum: Accounting department leaders' experiences and insights. *Journal of Accounting Education*, 52, 100655. Advance online publication. doi:10.1016/j.jaccedu.2020.100655
- Apostolou, B., Dorminey, J. W., & Hassell, J. H. (2020). Accounting education literature review (2019). *Journal of Accounting Education*, 51, 100670. Advance online publication. doi:10.1016/j.jaccedu.2020.100670
- Apostolou, B., Dorminey, J. W., Hassell, J. H., & Rebele, J. E. (2015). Accounting education literature review (2013–2014). *Journal of Accounting Education*, 33(2), 69–127. doi:10.1016/j.jaccedu.2015.04.001
- Apostolou, B., Dorminey, J. W., Hassell, J. H., & Watson, S. F. (2013). Accounting education literature review (2010–2012). *Journal of Accounting Education*, 31(2), 107–161. doi:10.1016/j.jaccedu.2013.03.001
- Arends, R. (2012). *Learning to teach* (9th ed.). McGraw-Hill Companies, Inc.
- Bardin, L. (2011). *Análise de conteúdo* [Content analysis]. Edições 70, Lda.
- Bell, J. (2005). *Doing your Research Project*. Open University Press, McGraw-Hill Education.
- Black, P. (2003). The nature and value of formative assessment for learning. *Improving Schools*, 6(3), 7–22. doi:10.1177/136548020300600304
- Bogdan, R., & Biklen, S. (2006). *Qualitative Research for Education: An Introduction to Theories and Methods* (5th ed.). Pearson education.
- Boyce, G., Williams, S., Kelly, A., & Yee, H. (2001). Fostering deep and elaborative learning and generic skill development: The strategic use of case studies in accounting education. *Accounting Education*, 10(1), 37–60. doi:10.1080/09639280121889
- British Educational Research Association (BERA). (2018). *Ethical Guidelines for Educational Research* (4th ed.). <https://www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-2018>
- Cohen, L. L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*. Routledge Publishers. doi:10.4324/9780203029053
- Dewey, J. (1960). *Experiencia y educación* [Experience and education]. Editorial Losada, S.A.
- Fernandes, D. (2016). Ensino e avaliação no ensino superior: Reflexões a partir da pesquisa realizada no âmbito do projeto AVENA [Teaching and evaluation in higher education: reflections from the research carried out within the scope of the AVENA project]. *Cadernos CEDES*, 36(99), 223–238. doi:10.1590/CC0101-32622016160370
- Gittings, L., Taplin, R., & Kerr, R. (2020). Experiential learning activities in university accounting education: A systematic literature review. *Journal of Accounting Education*, 52, 100680. Advance online publication. doi:10.1016/j.jaccedu.2020.100680
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). SAGE Publications Inc.
- Hill, M. M., & Hill, A. (2009). *Investigação por questionário* [Questionnaire investigation] (2nd ed.). Edições Sílabo.
- International Education Standards. (2019). *Handbook of International Education Pronouncements*. International Federation of Accountants. <https://www.ifac.org/system/files/publications/files/Handbook-of-International-Education-Standards-2019.pdf>

Jackling, B., & De Lange, P. (2009). Do Accounting Graduates' Skills Meet The Expectations of Employers? A Matter of Convergence or Divergence. *Accounting Education*, 18(4-5), 369–385. doi:10.1080/09639280902719341

Johnson, B., & Christensen, L. (2004). *Educational research: quantitative, qualitative, and mixes approaches* (2nd ed.). Pearson Education, Inc.

Karatzimas, S. (2020). The beneficial role of government accounting literacy in developing participatory citizens. *Accounting Education*, 29(3), 229–246. doi:10.1080/09639284.2020.1737547

Kolb, A. Y., & Kolb, D. A. (2005). Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. *Learning & Education*, 4(2), 193–212. <https://www.jstor.org/stable/40214287>

Labaree, D. F. (2000). On the Nature of Teaching and Teacher Education: Difficult Practices that Look Easy. *Journal of Teacher Education*, 51(3), 228–233. doi:10.1177/0022487100051003011

Lawson, R. A., Blocher, E. A., Brewer, P. C., Taylor Morris, J., Stocks, K., Sorensen, J., Stout, D. E., & Wouters, M. J. (2014). *Thoughts on Competency Integration in Accounting Education*. doi:10.2139/ssrn.247718210.2139/ssrn.2477182

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications. doi:10.1016/0147-1767(85)90062-8

Maloy, R. W., Oh, P., & Verock-O'Loughlin, R. (2005). The multiplying effects of technology coaching on teacher practices. In C. Vrasidas & G. Glass (Eds.), *Preparing teachers to teach with technology* (pp. 117–131). Information Age Publishing Inc.

Matos. (2014). *Princípios Orientadores para o Design de Cenários de Aprendizagem* [Guiding Principles for Designing Learning Scenarios] [Unpublished manuscript]. University of Lisbon, Portugal. http://ftelab.ie.ulisboa.pt/tel/gbook/wp-content/uploads/2017/05/cenarios_aprendizagem_2014_v4.pdf

Mihălțan, D. C. (2020). Improving the practical accounting skills of students by using appropriate teaching methods. *SEA - Practical. Applied Sciences (Basel, Switzerland)*, 23, 183–189. https://seaopenresearch.eu/Journals/articles/SPAS_23_6.pdf

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: an expanded sourcebook* (2nd ed.). SAGE Publications, Inc.

Mosbah, A. Y. S. (2018). *The required knowledge and skills from Libyan university accounting education and barriers to development: A mixed methods study using an institutional theory lens* [Unpublished doctoral dissertation]. University of Huddersfield. <http://eprints.hud.ac.uk/id/eprint/34773/>

OECD. (2018). *Global Skills Trends, Training Needs and Lifelong Learning Strategies for the Future of Work*. ILO and OECD Report for the G20 Employment Working Group. https://www.ilo.org/wcmsp5/groups/public/-dgreports/-inst/documents/publication/wcms_646038.pdf

OECD. (2020). *The Impact of COVID-19 on Education - Insights from Education at a Glance 2020: OECD Indicators*. OECD Publishing. doi:10.1787/69096873-en10.1787/69096873-en

Patton, M. Q. (1990). *Qualitative Evaluation and Research Methods* (2nd ed.). Sage Publications.

Rodrigues, A. L. (2019). Didática da Economia e da Contabilidade na formação inicial de professores – Revisão de literatura [Didactics of Economics and Accounting in initial teacher education – Literature review]. *Educação Sociedade & Culturas*, 55, 53–72. <https://www.fpce.up.pt/ciie/sites/default/files/06.AnaLui%CC%81saRodrigues.pdf>

Rodrigues, A. L. (2020). Digital technologies integration in teacher education: the active teacher training model. *Journal of e-Learning and Knowledge Society*, 16(3), 24–33. 10.20368/1971-8829/1135273

Rodrigues, A. L., & Patrocínio, T. (2018). Metodologias de ensino, avaliação e aprendizagem na formação de professores: A construção do modelo de formação ativa [Teaching, assessment and learning methods in teacher education: The construction of the active training model]. In B. Cabrito, J. M. Macedo, & L. Cerdeira (Org.), *Ensino superior no Brasil e em Portugal: Atualidades, questões e inquietações* [Higher Education in Brazil and Portugal: Current Issues, questions and concerns] (pp. 253–281). Educa. <http://hdl.handle.net/10451/35318>

Sangster, A., Stoner, G., & Flood, B. (2020). Insights into accounting education in a COVID-19 world. *Accounting Education*, 29(5), 431–562. doi:10.1080/09639284.2020.1808487

Soares, J. M., Souza, A. N., Azevedo, Y. G., Araújo, A. O., & Lima, D. H. (2019). Metodologias ativas de ensino: evidências da aplicação do Método de Caso nos cursos de Ciências Contábeis e Administração [Active teaching methods: evidence of the application of the Case Method in Accounting and Business Administration]. *RMC. Revista Mineira de Contabilidade*, 20(3), 92–103. doi:10.21714/2446-9114RMC2019v20net07

UNESCO. (2008). *ICT competency standards for teachers*. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/images/0015/001562/156207e.pdf>

Walsham, G. (1995). Interpretive case studies. IS research: Nature and method. *European Journal of Information Systems*, 4(4), 74–81. doi:10.1057/ejis.1995.9

Yin, R. K. (1994). *Case Study Research: Design and Methods* (2nd ed.). SAGE Publications.

Yin, R. K. (2011). *Qualitative research from start to finish*. The Guilford Press.

ENDNOTES

- ¹ Institute of Education, University of Lisbon, <http://www.ie.ulisboa.pt/en>
- ² Directorate-General for Education and Science Statistics (Portuguese), <https://www.dgeec.mec.pt>
- ³ Technology Enhanced Learning at Future Teacher Education Lab Project, http://ftelab.ie.ulisboa.pt/tel/index.php?option=com_content&view=featured&Itemid=101&lang=en
- ⁴ Future Classroom Lab, <http://www.eun.org/pt/professional-development/future-classroom-lab>

Ana Luísa Rodrigues is Assistant Professor at the Institute of Education, University of Lisbon, in the Degree and Master's in Education and Training, Educational Administration and Economics and Accounting Education. PhD in Education, specialized in ICT Education, and Master's in Economics and Accounting Teaching. She also has a previous master's degree in Management and Industrial Strategy and a degree in Organization and Business Management. Participates in research projects and has publications of peer-reviewed papers and chapters in scientific books on research carried out mainly in the teaching area on Teacher Education, Technologies in Education, and Economics and Accounting Education.