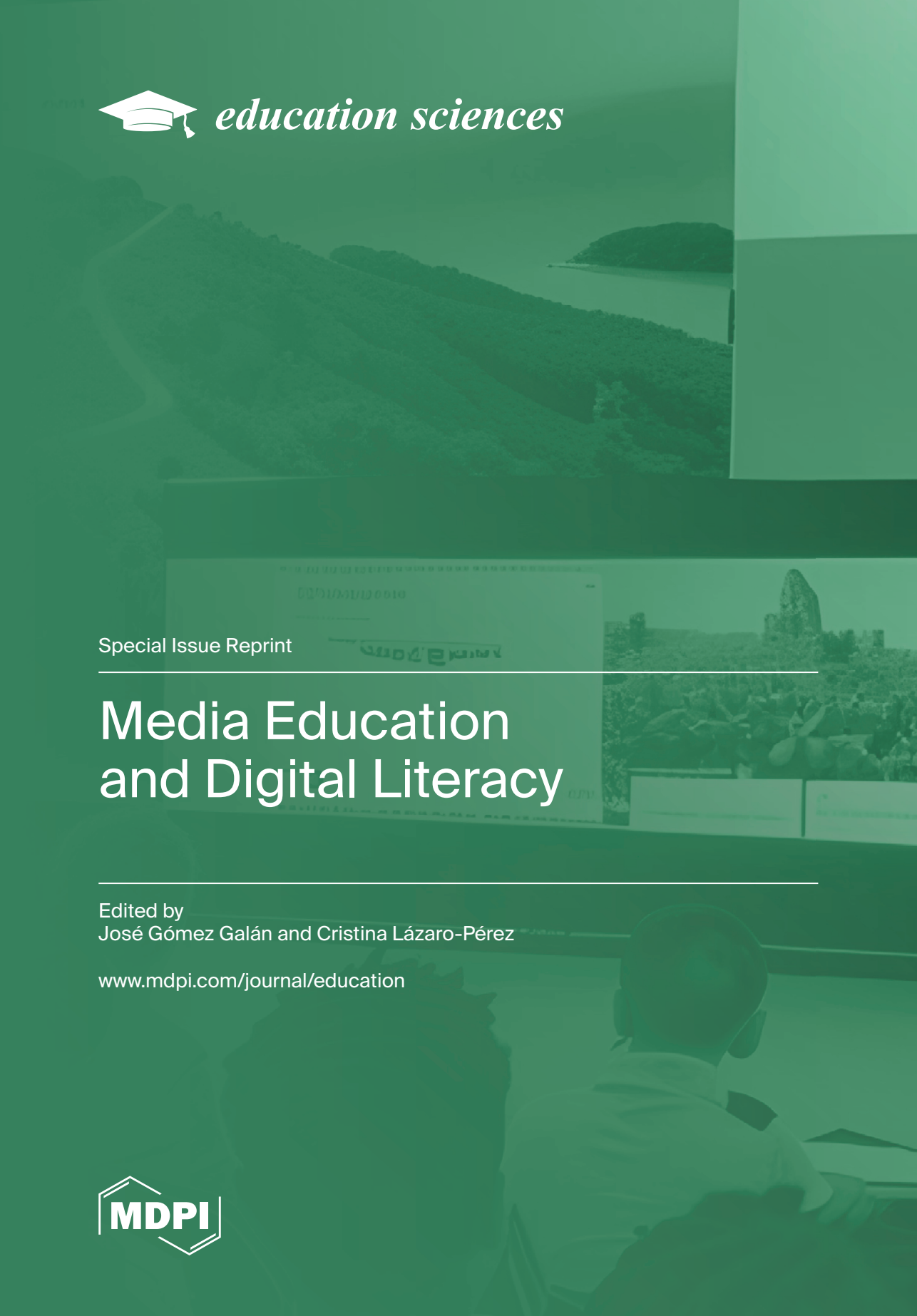
education sciences



Special Issue Reprint

# Media Education and Digital Literacy

Edited by
José Gómez Galán and Cristina Lázaro-Pérez

www.mdpi.com/journal/education

MDPI

# Media Education and Digital Literacy

# Media Education and Digital Literacy

Editors

**José Gómez-Galán**
**Cristina Lázaro Pérez**

MDPI • Basel • Beijing • Wuhan • Barcelona • Belgrade • Manchester • Tokyo • Cluj • Tianjin

*Editors*
José Gómez-Galán
University of Extremadura
Badajoz, Spain

Cristina Lázaro Pérez
University of Murcia
Murcia, Spain

*Editorial Office*
MDPI
St. Alban-Anlage 66
4052 Basel, Switzerland

This is a reprint of articles from the Special Issue published online in the open access journal *Education Sciences* (ISSN 2227-7102) (available at: https://www.mdpi.com/journal/education/special_issues/media_education_digital_literacy).

For citation purposes, cite each article independently as indicated on the article page online and as indicated below:

LastName, A.A.; LastName, B.B.; LastName, C.C. Article Title. *Journal Name* **Year**, *Volume Number*, Page Range.

**ISBN 978-3-0365-8006-7 (Hbk)**
**ISBN 978-3-0365-8007-4 (PDF)**

Cover image courtesy of José Gómez Galán and Cristina Lázaro Pérez

# Contents

# About the Editors

**José Gómez Galán**

José Gómez Galán, Ph.D. Full Professor at the University of Extremadura (Spain). Ph.D. in Philosophy and Educational Sciences (UNED) and Ph.D. in Geography and History (Universidad Complutense de Madrid). National Award for Educational Research and Award for Teaching Excellence (DOCENTIA). Director of research groups at the international level. Director of academic journals. Author of more than 300 multidisciplinary scientific publications, of which we can highlight those included in the Q1 and Q2 quartiles of JCR and Scopus. He has been a professor and/or researcher at the Universities of Minnesota (United States), Oxford (United Kingdom), La Sapienza of Rome (Italy), several Latin American universities, etc.

**Cristina Lázaro Pérez**

Cristina Lázaro Pérez, Ph.D. Professor at the University of Murcia (Spain). Ph.D. in Social Anthropology from the University of Murcia. She belongs to the research group "Consciousness, Culture and Identity" of the University of Murcia. Author of books and multiple scientific articles, of which we can highlight those collected in the quartiles Q1 and Q2 of JCR and Scopus. She has attended numerous educational and scientific conferences as a speaker in different countries.

# Preface to "Media Education and Digital Literacy"

The digital revolution is profoundly modifying our lifestyle habits and our means of understanding the world. It seems evident that we are aiding the birth of a new stage in our civilization. In particular, the digital revolution of ICT—which has brought with it the digitization of all information—is paving the way for a new era. Physical space, as much a determining factor as in the previous stages of history, loses relevance when it is substituted by a virtual space where human communication covers the whole planet in every sphere (cultural, economic, social, etc.). Within this context, education has to offer responses to new needs. 21st century humans need knowledge, capabilities, and outlooks for a new society in which communicative processes hold immense importance. Just like traditionally, when one of the basic objectives of education was linguistic and cognitive literacy—with the acquisition of fundamental competencies such as the ability to read and to write—today, literacy in new multimedia and hypermedia languages is also necessary. This is what we would call digital literacy.

Due to the digital revolution, we are currently in a process of convergence that we call techno-media, in which media—as much the traditional as the new, from the press or the radio to the Internet and social networks—cease to exist as separate entities in order to form a unique digital medium that covers the whole of human communication. The divisions between the media disappear, and we find ourselves in a unique interactive communication system borne out of the digital paradigm. In this sense, our knowledge of technology and means of communication, the absolute pillars of our world, become essential. Most importantly, in the world of education, to face the challenge, it is not necessary to create an extraordinary and complex innovation of uncertain productivity, since we already have a fundamental pedagogical paradigm of long-standing tradition and excellent results where it is applied: media education. This is something which should be essential in search of authentic education for contemporary needs, and a fundamental foundation of the correct literacy of a modern citizen, which will allow us to transform and improve society and undertake effective digital literacy from the grassroots level.

Media education is now a fundamental pedagogical model for properly developing current digital literacy methods. In a society dominated by the flow of information and communication processes, it is essential to draw on all the experience of fundamental principles, pedagogical theories, and practices that this educational paradigm has offered for decades. Today's techno-media society is not an altruistic system. It serves multiple economic, political, and social interests. In this context, if education is understood as the best way to developing our society and nurture values and solidarity, it is essential to analyze schooling that awakens individuals to the power and influence of ICT and its true meaning in the world. Authentic digital literacy must include a correct understanding of new techno-media languages and cannot be reduced to a technical and instrumental type of training, which, however, is still necessary. Undoubtedly, using these media in educational processes, always in the context of pedagogical and didactic principles, is very useful for achieving many different educational objectives.

It is a pleasure to present this book, which brings specialists from different academic fields together. They have in common the use of technology and media in their educational practices. The topic has been the subject of much debate in recent years, so different approaches are inevitable. Each chapter is dedicated to a specific aspect based on rigorous studies and university experience. The authors of these chapters are experts in their respective fields and have contributed their perspectives and viewpoints. As you read these pages, you will find a wealth of information and analysis that will deepen your understanding of the subject. You will also gain a sense of the complexities and nuances

surrounding it and the challenges that must be overcome to address it effectively. We hope this book will be a valuable resource for students, academics, researchers, and anyone interested. We believe that the ideas contained within these pages will contribute to a better understanding of what we now understand as media education.

**José Gómez-Galán and Cristina Lázaro Pérez**
*Editors*

education sciences

MDPI

*Article*

# Outside Training of Spanish University Students of Education for the Didactic Application of Cinema: Formal, Non-Formal, and Informal Perspectives

**Alejandro Lorenzo-Lledó *, Asunción Lledó, Gonzalo Lorenzo and Alba Gilabert-Cerdá**

Department of Development Psychology and Teaching, Faculty of Education, University of Alicante, 03690 San Vicente del Raspeig, Spain; asuncion.lledo@ua.es (A.L.); glledo@ua.es (G.L.); alba.gilabert@ua.es (A.G.-C.)

* Correspondence: alejandro.lorenzo@ua.es

**Abstract:** Nowadays, audiovisual media play a central role in access to information and in personal relationships. Among the audiovisual media is cinema, which due to its heterogeneous nature, can fulfill diverse educational functions. The objective of this study was to learn about the training that future teachers in Spain receive outside of their teaching degree for the didactic use of cinema. In addition, we sought to understand the influence of training on perceptions regarding the educational potential of cinema and the predisposition to its use. Using a quantitative approach, information was collected from 4659 students from 58 Spanish universities. The questionnaire used covered perceptions about the potencialities of cinema as a didactic resource in pre-school and primary classrooms (PECID). The results showed that 95.1% of the students had not received training. In addition, we found a significant influence of training on their perceptions of the educational possibilities of cinema. Furthermore, we found an influence on their predisposition to use training in their future teaching practice. Overall, it is necessary to implement training actions to fill the gaps detected in favor of a quality education with active learning and linked to society.

**Keywords:** cinema; audiovisual media; preservice teacher training; university education; didactic resource; formal education; non-formal education; informal education

**Citation:** Lorenzo-Lledó, A.; Lledó, A.; Lorenzo, G.; Gilabert-Cerdá, A. Outside Training of Spanish University Students of Education for the Didactic Application of Cinema: Formal, Non-Formal, and Informal Perspectives. *Educ. Sci.* **2022**, *12*, 38. https://doi.org/10.3390/educsci12010038

Academic Editors: José Gómez Galán, Jose Ángel Martínez-López, Cristina Lázaro-Pérez and João Piedade

Received: 13 September 2021
Accepted: 22 December 2021
Published: 8 January 2022



## 1. Introduction

Nowadays, audiovisual media play a central role in access to information and can influence personal relationships and the vision of reality. As such, audiovisual media are part of people's daily life and, therefore, new training needs arise. Thus, media and audiovisual literacy contribute to the practice of citizenship, to community work, to the generation and interchange of knowledge, and to social change. As such, media and audiovisual literacy are essential factors in the social integration of at-risk groups [1].

Among the audiovisual media is cinema, which has more than 125 years of history, is a central part of life with fascinating stories, and can be considered the diary of humanity [2]. Cinema is characterized by having a heterogeneous nature and can be considered as art, technique, mass media, historical document, expressive language, or technological resource. This allows it to fulfill diverse educational functions based on the proposed learning objectives. Along these lines, a distinction is made between educating with cinema and educating in cinema [3]. In the first case, cinema is integrated into the classroom as a didactic aid. In the second case, it is used as a creative process and to teach the development of a critical view, forming responsible spectators using images and sounds. The educational possibilities of cinema offer teachers great didactic alternatives. These include reinforcing content, enhancing creativity, introducing students to the audiovisual world, or working on visual and cultural manifestations [4]. In this way, film is a resource that can be used to promote humanism and improve many skills and competencies for students. These

skills and competencies will be needed in the workplace [5]. However, it is essential that the didactic application of cinema be approached from the perspective of innovation, promoting a more participatory, open, interdisciplinary, and personalized methodology. In this manner, new relationships are created between teachers and students and amongst the students themselves. More importantly, this enriches the teaching–learning process. Only in this sense can cinema fully meet the educational objectives. The present study advocates an integrative and holistic view of film in education, on the one hand as a didactic resource (backup and support) for learning strategies, and on the other hand as an audiovisual medium. In this regard, knowledge of the cinematographic language should be investigated to develop a critical vision and an understanding of how to create cinematographic works by incorporating different digital tools and technologies.

For the use of didactic resources, teacher training should be considered. For these reasons, teacher training is the first stage in which the foundations of a professional mindset are laid, providing a set of tools to develop meaningful learning in the classroom [6]. In this regard, it is the gateway to professional development [7]. At the same time, it should provide the skills and tools necessary for teachers to face the transformations of a changing and dynamic society [8].

Additionally, the need for professional knowledge to be built from practice and not only from theory has been acknowledged; it is a question of connecting initial training more closely with the reality of education and prioritizing the correct integration of disciplinary, didactic, and psychopedagogical contents [9,10]. For these purposes, future teachers should work on problem-solving skills, critical thinking, the development of interpersonal and collaborative skills as opposed to memorization, and passive transmission of knowledge [11].

Today, student training is no longer confined to formal educational institutions. In this sense, the emergence of new training environments and the greater presence of the media and electronic networks mean that schools are no longer the only institutions where people acquire training [12]. Therefore, to address the training of the individual, it is appropriate to adopt a holistic approach and attend to different training modalities. The author of [13] distinguishes between informal learning, formal learning, and non-formal learning. Informal learning is the result of daily activities related to work, family life, or leisure, and there is no predefined organization, structuring of objectives, duration, or training resources. Formal learning takes place in organized and structured environments, such as educational centers, and is explicitly designated as formal training. Finally, non-formal learning is learning derived from planned activities, but not specifically designated as training programs. Both formal and non-formal learning presuppose intentionality on the part of the learner [13].

Likewise, the International Standard Classification of Education (ISCED) [14] addresses the concepts of formal education, non-formal education, informal learning, and incidental learning. Firstly, formal education is the institutionalized and intentional education organized by public entities and accredited private organizations that constitute the formal education system of various countries. Secondly, non-formal education, as with formal education, is a form of institutionalized education, which is instructed and organized by an education provider. This represents an alternative or complement to the formal education of individuals within the lifelong learning process. In this sense, it is usually administered in the form of courses, seminars, and workshops. Thirdly, informal learning is an intentional or deliberate—although not institutionalized—mode of learning. Consequently, this form of learning is less structured and organized than those corresponding to formal and non-formal education. In the same way, it may include learning activities carried out at home, in the workplace, in the community, or as part of daily activities. Lastly, unplanned learning includes various forms of learning that are not organized or that involve communication activities that are not designed for the purpose of producing learning. An example of it would be a television broadcast that does not constitute an educational program [14].

Changes that have taken place in training facilities have had repercussions on university education, which over the years has undergone an evolution in its conception. The authors of [15] state that with the European curriculum vitae the fields of formal, non-formal, and informal education have acquired a new prominence and are more closely intertwined. These authors indicate that in the 1970s and 1980s, the emphasis was on formal education. With this, education had a disciplinary character, a methodology of face-to-face classes, a strong separation between teacher and student, as well as differentiated spaces and times. In the 1990s, non-formal education began taking on a greater role in university education, with less classroom attendance and greater contextualization of learning. In this way, the European Higher Education Area (EHEA) assists in developing aspects that had hitherto been relegated to the realm of informal education, together with the already existing elements of formal and non-formal education [15]. As a consequence, the university training of students is composed of multiple scenarios, in addition to the classroom. It incorporates the full range of synchronous and asynchronous curricular resources and spaces, such as the library, digital portals, and various activities [16]. One of these more recent manifestations is Massive Open Online Courses (MOOC), which have generated a remarkable level of student satisfaction [17].

The diversity of possible educational scenarios is an opportunity for individuals to increase their training. Nevertheless, in the case of film in education, the shortcomings remain significant. In this sense, [18] noted in Spain the insufficient and scattered training dispensed in the Teacher's Degree for the didactic use of film. In view of this situation, the initiative that arose within the Spanish Academy of Motion Picture Arts and Sciences with the publication of the *Framework Document on Cinema and Education* [19] is noteworthy. This initiative proposes the need for an audiovisual literacy plan, based on a series of objectives and action itineraries, to integrate audiovisual education at different levels of non-university education. On the other hand, beyond formal education, it is important to note the efforts of the National Agency for Educational Technology and Teacher Development (INTEF), which provides resources and has offered online courses on cinema as a teaching resource and audiovisual literacy. In addition, there are 59 film and education platforms and associations, which develop resources, advice, and training plans [19]. It is also remarkable the emergence of numerous festivals specialized in films for children and made by children and young people, along with the initiatives in general festivals to promote audiovisual education and the existence of specialized magazines [19,20]. Furthermore, the pedagogical work of public and private entities should be underlined, with special mention of museums and film libraries [21,22].

Outside Spain, it is worth mentioning the efforts of the British Film Institute (BFI) throughout several works: to define the concept of film literacy [23–26], determine strategies to integrate film into education [27,28], or create dimensions and learning areas for film education [29]. Similarly, [30] conducted a study for the European Commission. In this research, based on the analysis of the use of film in schools, a series of recommendations are proposed for the inclusion of film in the classroom with implications at the educational level.

For its part, it is appropriate to highlight UNESCO's firm commitment to fostering media literacy in society. In this regard, *Media and Information Literacy: Curriculum for teachers* [31] was promulgated. As [32] point out, this is a key international initiative for teacher training in media. The intention is to offer an introductory and flexible curriculum to be used in teacher training at different stages. From this, different media and information literacy program modules are offered. It is important to specify that the modules can be selected, developed, and adapted to meet the needs and abilities of individual teachers. In this respect, as stated in the introductory section of the curriculum, the aim is to "achieve a multiplier effect: from teachers who are media and information literate, whose knowledge they can pass on to their students and eventually to society as a whole" [31] (p. 17). In this way, teachers would be "fulfilling their first role as advocates of informed and rational

citizenship, and secondly, they would be responding to changes in their role as educators as teaching evolves" [31] (p. 17).

UNESCO integrates into the term Media and Information Literacy the aspects of media literacy and information literacy, although starting from their individual meaning. For media literacy, [31] states that it is necessary to: understand the role and functions of the media and its conditions, critically evaluate media content, use the media for self-expression and democratic participation, and have skills to generate content. Equally, it encourages the convergence of the media, including cinema, radio, television, and the Internet, among others. As [33] notes, it is commendable that UNESCO has offered this curriculum as a starting point for teacher education, putting the focus on education, linking teachers' skills development to helping students explore their experiences with media. In the case of cinema, this curriculum can be a reference to develop, as considered, specific teacher training plans at different stages. On the one hand, this can be conducted through formal education or, on the other hand, through initiatives in the field of non-formal education.

With the growing consensus on the need to implement media education, a notable scientific production has been generated that has dealt with the subject from different perspectives. Thus, studies have been developed that have analyzed the state of media education in each country, reviewing policies, tools, and training programs [34–38]. Comparative analyses have also been made of media education activities, initiatives, and projects in the countries of the European Union (EU) and the Commonwealth of Independent States (CIS) [39,40]. Effective media education practices and the integration of media literacy into the curriculum have been reviewed [41–43]. Furthermore, different models for media education have been developed, reviewed, and proposed pedagogical approaches and recommendations for implementation [44–48]. In addition, research has been conducted to design and validate instruments to measure the media competence of teachers [49], future teachers [50], and adolescents [51]. Another line of research has been to identify the level of media competence of pre-service teachers, schoolchildren, and the elderly [52–55]. People's perceptions of the media skills needed and the risks of not having them, as well as the impact of media literacy on the development of digital citizenship, have also been measured [56,57]. Other studies have dealt with teachers' valuation of the application of media literacy and its obstacles [58–61], and the way in which trainee teachers perceive the aims and methods of media literacy [62]. Additionally, experiences and training scenarios for future teachers have been discussed, analyzing strengths and weaknesses [63,64], and audiovisual educational techniques and tools for technology-enhanced learning have been examined [65].

Specifically, in the field of university training of future teachers in Spain, [18] analyzed whether students receive in the Teacher's Degree the academic training in the didactic use of cinema and what activities with cinema are applied by teachers. Meanwhile, studies by [66–68] have dealt with media literacy in Spanish university faculties of education. Furthermore, [19] investigated the presence of cinema training content in the curricula of non-university educational stages. In the context of informal learning, [69] also addressed the cinematographic habits of future teachers in Spain from a socio-educational approach. Nonetheless, there are no studies that, bearing in mind the different training modalities, investigate the training that future teachers receive outside of their undergraduate studies; neither is there any research analyzing the influence of this training. In this connection, there is a research gap that needs to be filled.

Based on the above background, the general objective of this study is to determine the training that future teachers in Spain receive outside the Teacher's Degree for the didactic use of film, as well as to understand its influence on their perceptions of the educational potential of film and their predisposition to its use. The following specific objectives underlie the general objective:

1. To analyze the extent to which training is being received outside the Teacher's Degree throughout Spain. Specifically, it is analyzed according to the Autonomous Com-

munity, the type of Teacher's Degree of the student body and the type of university where it is being studied.
2. To determine the means of training employed by prospective teachers outside the Teacher's Degree for the didactic use of film and the hours of training received.
3. To detect the perceived competence to use technological tools in the creation of cinematographic proposals.
4. To identify the differences in the perceptions about the educational potentialities of cinema and the predisposition to its use. For this purpose, it is considered whether training has been received outside Teacher's Degree for its didactic application.

## 2. Materials and Methods

The present study adopted a descriptive non-experimental quantitative approach with a survey design. In this line, Ref. [70] suggest that the survey is characterized, on the one hand, by the absence of manipulation in the collection of information. On the other hand, it is characterized by the importance given to the aspects of the breadth of the sample of subjects forming the study and to the generality of the results. Moreover, this is a comparative-causal study [71], since, in addition to providing descriptive information on the variables quantified, the possible significant differences between the groups compared were analyzed. From another perspective, since the data collection was carried out at a specific time, it is also a cross-sectional study [72].

### *2.1. Participants*

The study presented here was carried out with a sample of 4659 students from all the Spanish autonomous communities and from both public and private universities. A quota sampling technique [73] was used to select the sample. Of the sample, 84.5% ($n$ = 3939) were women and 15.5% ($n$ = 720) were men. Apart from that, 51.0% ($n$ = 2378) were students of the Primary Education Teacher Degree compared to 49.0% ($n$ = 2281) of students of the Pre-School Education Teacher Degree. Additionally, 89.8% ($n$ = 4183) of the participants belonged to public universities and 10.2% ($n$ = 476) to private universities. In terms of age, participants were between 18 and 66 years old, with a mean of 22.2 years (SD = 3.9). A total of 42.9% ($n$ = 1999) of the students were in the third year, 27.6% ($n$ = 1286) in the second year, 23.2% ($n$ = 1080) in the fourth year and 6.3% ($n$ = 294) in the first year. Regarding territorial distribution, Table 1 shows the frequencies and percentages of participating students according to the autonomous community in which they studied.

**Table 1.** Participating students by autonomous community [74].

| Autonomous Community | Students | |
|---|---|---|
| | f | % |
| Andalusia | 1161 | 24.9 |
| Aragon | 69 | 1.5 |
| Asturias | 99 | 2.1 |
| Balearic Islands | 76 | 1.6 |
| Canary Islands | 205 | 4.4 |
| Cantabria | 45 | 1.0 |
| Castilla-La Mancha | 110 | 2.4 |
| Castile and Leon | 171 | 3.7 |
| Catalonia | 642 | 13.8 |
| Valencian Community | 601 | 12.9 |
| Extremadura | 88 | 1.9 |
| Galicia | 251 | 5.4 |
| Madrid | 636 | 13.7 |
| Murcia | 218 | 4.7 |
| Navarre | 71 | 1.5 |
| Basque Country | 156 | 3.3 |
| La Rioja | 60 | 1.3 |
| Total | 4659 | 100.0 |

Table 2 shows the number of students participating according to the university to which they belong.

**Table 2.** Participating sample by university [74].

| University | f | % |
|---|---|---|
| University of A Coruña | 119 | 2.6 |
| University of Alcalá | 166 | 3.6 |
| Alfonso X el Sabio University | 3 | 0.1 |
| University of Alicante | 196 | 4.2 |
| University of Almería | 23 | 0.5 |
| Nebrija University | 19 | 0.4 |
| Autonomous University of Barcelona | 73 | 1.6 |
| Autonomous University of Madrid | 154 | 3.3 |
| University of Barcelona | 64 | 1.4 |
| University of Burgos | 24 | 0.5 |
| University of Cádiz | 155 | 3.3 |
| Camilo José Cela University | 24 | 0.5 |
| University of Cantabria | 41 | 0.9 |
| CEU Cardenal Herrera University | 35 | 0.8 |
| University of Castilla-La Mancha | 110 | 2.4 |
| Catholic University San Antonio | 33 | 0.7 |
| Catholic University Santa Teresa de Jesús de Ávila | 2 | 0.0 |
| Valencia Catholic University San Vicente Mártir | 9 | 0.2 |
| Complutense University of Madrid | 45 | 1.0 |
| University of Córdoba | 224 | 4.8 |
| University of Deusto | 13 | 0.3 |
| European University of the Atlántico | 4 | 0.1 |
| University of Extremadura | 88 | 1.9 |
| Francisco de Vitoria University | 13 | 0.3 |
| University of Girona | 158 | 3.4 |
| University of Granada | 116 | 2.5 |
| University of Huelva | 101 | 2.2 |
| University of the Islas Baleares | 76 | 1.6 |
| Internacional University of Cataluña | 8 | 0.2 |
| Jaume I University | 223 | 4.8 |
| University of Jaén | 25 | 0.5 |
| University of La Laguna | 88 | 1.9 |
| University of La Rioja | 60 | 1.3 |
| University of Las Palmas de Gran Canaria | 117 | 2.5 |
| University of León | 27 | 0.6 |
| University of Lleida | 111 | 2.4 |
| Loyola University Andalucía | 30 | 0.6 |
| Mondragón University | 70 | 1.5 |
| University of Murcia | 185 | 4.0 |
| University of Málaga | 186 | 4.0 |
| University of Navarra | 23 | 0.5 |
| University of Oviedo | 99 | 2.1 |
| University of País Vasco | 73 | 1.6 |
| Comillas Pontifical University | 32 | 0.7 |
| Pontifical University of Salamanca | 33 | 0.7 |
| Public University of Navarra | 48 | 1.0 |
| Ramon Llull University | 96 | 2.1 |
| Rey Juan Carlos University | 180 | 3.9 |
| Rovira i Virgili University | 118 | 2.5 |
| University of Salamanca | 54 | 1.2 |
| San Jorge University | 15 | 0.3 |
| University of Santiago de Compostela | 35 | 0.8 |
| University of e Sevilla | 301 | 6.5 |
| University of Valladolid | 31 | 0.7 |
| University of e Valencia | 138 | 3.0 |
| University of Vic | 14 | 0.3 |
| University of Vigo | 97 | 2.1 |
| University of Zaragoza | 54 | 1.2 |
| Total | 4659 | 100.0 |

The different number of participants according to the autonomous community is in the line with the fact that the largest population of students corresponds to the territories with the largest number of universities. To determine the representativeness of the sample,

we used the formula n = K2 p q N/E2 (N−1) + K2 p q, which is suitable for the case of finite populations [75]. The Spanish Ministry of Education and Vocational Training reports that the population of students of the Teacher Training Degree in Spain is 118,525. Consequently, the total sample is representative of the chosen population with a sampling error of 1.4% and a confidence level of 95.5%. If we consider the type of Teacher Degree, the student population of the Teacher Degree in Pre-School Education is 44,779 and that of the Teacher Degree in Primary Education is 73,746. The sample is representative of the two Teacher Degrees with a sampling error of 2%. In relation to the type of university, the student population of public universities is 92,045 and that of private universities is 26,480. The sample is representative of public universities and private universities with a sampling error of 1.5% and 4.5%, respectively.

### *2.2. Instrument*

For data collection, the questionnaire *Perceptions about the potentialities of cinema as a didactic resource in pre-school and primary classrooms (PECID)* was designed ad hoc, consisting of 45 items, distributed in two parts. In this direction, the third section of the first part of the PECID questionnaire, with 11 items, focuses on the training received for the use of cinema as a didactic resource. The second part of the questionnaire includes 25 items on a Likert-type scale, with three dimensions, on the perceptions of the potential of film as a teaching resource in pre-school and primary education. The first dimension is composed of nine items and the second and third dimensions of eight items each [74]. There are six response options (1 = totally disagree; 2 = quite disagree; 3 = sometimes disagree; 4 = sometimes agree; 5 = quite agree; 6 = totally agree). As a conclusion of the questionnaire, there is an item about the predisposition to use film in the classroom when students become teachers in the future.

The PECID questionnaire underwent a validation process to obtain content validity, reliability, and construct validity [74]. To obtain content validity, the items were subjected to expert judgment [76,77], applying the content validity coefficient (CVC) of [78]. In this aspect, with reference to the items of the third section of the first part of the questionnaire, only one item had to be eliminated, keeping the items with a CVC higher than 0.80. In this respect, according to [78], good content validity is guaranteed. Regarding the items on perceptions of the potential of film as a teaching resource, three items were eliminated, one from each dimension, and the items with values above 0.80 were also maintained. In terms of reliability, the Likert-type scale on perceptions obtained a Cronbach's alpha coefficient of 0.978, which, according to [79], is a value of excellent reliability. As for construct validity, a constitutive definition [80] was elaborated for the perceptions of the students of the Teacher's Degree on the potential of cinema as a didactic resource in pre-school and primary education. Thus, it was defined as the perceptions concerning the didactic possibilities offered by cinema to develop the teaching-learning processes in the educational stages of pre-school and primary school. This variable was broken down into three dimensions or factors of perceptions [74]:

(1) The potential of cinema as a didactic resource for the transmission of contents. It is conceptualized as the mediating possibilities of cinema as a communication and symbolic representation support to transmit concepts, attitudes, and values to students.
(2) The potential of cinema as a didactic resource for expression and communication. It is conceptualized as the mediating possibilities of cinema as a form of representation and projection to develop relationships and exchange of information among students.
(3) The potential of cinema as a didactic resource for critical analysis. It is conceptualized as the mediating possibilities of cinema to develop in students a conscious and proper analysis of reality.

After performing an exploratory and confirmatory factor analysis, three factors were obtained based on the goodness-of-fit indexes obtained: a comparative fit index (CFI) of 0.957, a root mean square (RMSEA) of 0.109, and a standardized root mean square (SRMR) of 0.032. Following [81], this is a model with good fit values. Further, in the confirmatory

analysis, the Cronbach's alpha obtained for the three factors was high: 0.965 for factor 1, 0.963 for factor 2, and 0.961 for factor 3 [74]. Confirmatory factor analysis was performed using the Mplus program in version 8 [82].

The results presented in this study are those related to the following items: whether training has been received outside the Teacher's Degree, through which means training was received, how many hours of training, the Degree of competence perceived for the use of technological tools for the development of cinematographic proposals, and the predisposition to use cinema as a didactic resource in the classroom in the future teaching practice. As for the results presented on the differences in perceptions depending on whether training was received outside the Teacher's Degree, the items are grouped according to the three established dimensions.

### 2.3. Procedure

Data collection was carried out in several phases. Firstly, we proceeded to identify the Spanish universities, both public and private, in the different territories, that offer the Teacher's Degree. For this purpose, data provided by the Spanish Ministry of Education and Vocational Training were used. As a result, it was determined that there are 63 universities in Spain that offer the Teacher's Degree, of which 39 are public and 24 are private. Secondly, we contacted the teaching staff of the universities to inform them of the objectives of the research and to request their collaboration in the dissemination of the questionnaire among their students. Of all the universities, five private universities did not agree to participate in the study. Overall, the data were obtained through the completion of the questionnaire in Spanish by the student body during the 2018/2019 academic year through the Google Forms tool. The students were informed that their participation in the research was voluntary and anonymous, and their consent was obtained. In this line, any personal data that did not respect confidentiality was excluded. Regarding the collected information, it was used exclusively for the purposes of this research.

### 2.4. Data Analysis

After planning and implementing the data collection process, the data were analyzed using the SPSS statistical program for Windows version 21 (IBM Corp., Armonk, NY, USA). Descriptive statistics were analyzed using frequencies, percentages, means, and standard deviations. For the inferential analysis of the possible significant differences in the variables chosen according to the two groups compared, the *t*-test was chosen, with a significance value of $p < 0.05$. In this case, to examine univariate normality, the distribution of the data was analyzed. For this purpose, the Kolmogorov–Smirnov test was performed, whose statistics resulted in a significance of 0.000 for the variable perceptions about the potential of cinema in its three dimensions or factors. This shows that the data do not exhibit a normal distribution criterion. In relation to the skewness and kurtosis values, however, these are less than 2 and 7, respectively, therefore, they can be considered within normality [83].

## 3. Results

The results are presented below, ordered according to the quantified variables and the proposed objectives.

### 3.1. Training Received outside the Teacher's Degree in Spain and Depending on the Autonomous Community, the Type of Teacher's Degree and the Ownership of the University

With regard to the results on the training received by students of the Teacher's Degree outside their Degree studies for the didactic use of film in Pre-School and Primary Education classrooms, 95.1% ($n = 4433$) have not received training compared to 4.9% ($n = 226$) of the students who have received training.

If we observe the training received in terms of the autonomous community of the study, Table 3 shows the results.

**Table 3.** Percentages and frequencies of training received outside the Teacher's Degree according to autonomous community.

| Education Outside the Teacher's Degree | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AACC | Yes | | | No | | | Total | | |
| | f | % AACC | % Spain | f | % AACC | % Spain | f | % AACC | % Spain |
| Andalusia | 47 | 4.0 | 1.0 | 1114 | 96.0 | 23.9 | 1161 | 100.0 | 24.9 |
| Aragon | 3 | 4.3 | 0.1 | 66 | 95.7 | 1.4 | 69 | 100.0 | 1.5 |
| Asturias | 6 | 6.1 | 0.1 | 93 | 93.9 | 2.0 | 99 | 100.0 | 2.1 |
| Balearic Islands | 3 | 3.9 | 0.1 | 73 | 96.1 | 1.6 | 76 | 100.0 | 1.6 |
| Canary Islands | 15 | 7.3 | 0.3 | 190 | 92.7 | 4.1 | 205 | 100.0 | 4.4 |
| Cantabria | 2 | 4.4 | 0.0 | 43 | 95.6 | 0.9 | 45 | 100.0 | 1.0 |
| Castilla–La Mancha | 7 | 6.4 | 0.2 | 103 | 93.6 | 2.2 | 110 | 100.0 | 2.4 |
| Castile and Leon | 8 | 4.7 | 0.2 | 163 | 95.3 | 3.5 | 171 | 100.0 | 3.7 |
| Catalonia | 26 | 4.0 | 0.6 | 616 | 96.0 | 13.2 | 642 | 100.0 | 13.8 |
| Valencian Community | 25 | 4.2 | 0.5 | 576 | 95.8 | 12.4 | 601 | 100.0 | 12.9 |
| Extremadura | 5 | 5.7 | 0.1 | 83 | 94.3 | 1.8 | 88 | 100.0 | 1.9 |
| Galicia | 8 | 3.2 | 0.2 | 243 | 96.8 | 5.2 | 251 | 100.0 | 5.4 |
| Madrid | 48 | 7.5 | 1.0 | 588 | 92.5 | 12.6 | 636 | 100.0 | 13.7 |
| Murcia | 12 | 5.5 | 0.3 | 206 | 94.5 | 4.4 | 218 | 100.0 | 4.7 |
| Navarre | 5 | 7.0 | 0.1 | 66 | 93.0 | 1.4 | 71 | 100.0 | 1.5 |
| Basque Country | 1 | 0.6 | 0.0 | 155 | 99.4 | 3.3 | 156 | 100.0 | 3.3 |
| La Rioja | 5 | 8.3 | 0.1 | 55 | 91.7 | 1.2 | 60 | 100.0 | 1.3 |
| Total | | | | | | | 4659 | | 100.0 |

The results show that the percentage of students in all autonomous communities who received training outside the Teacher's Degree is very low, not exceeding 8.4% in any of them. Among the autonomous communities with the highest percentages of students with training, La Rioja, Madrid, Canary Islands, and Navarre stand out, with 8.3%, 7.5%, 7.3%, and 7.0%, respectively. Most of the communities have percentages of students with education outside the Degree that range between 3.9% and 6.0%. The Basque Country is detected as the region with the lowest percentage of educated students (0.6%).

In relation to the results on the training received by students outside the Teacher's Degree according to the Degree studies they are pursuing, Table 4 is presented below.

**Table 4.** Percentages and frequencies of training received outside the Teacher's Degree as a function of the type of Teacher's Degree.

| Education Outside the Teacher's Degree | Teacher's Degree in Pre-School Education | | | Teacher's Degree in Primary Education | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % Pre. | % Spain | f | % Pri. | % Spain | f | % Spain |
| Yes | 107 | 4.7 | 2.3 | 119 | 5.0 | 2.6 | 226 | 4.9 |
| No | 2174 | 95.3 | 46.7 | 2259 | 95.0 | 48.5 | 4433 | 95.2 |
| Total | 2281 | 100.0 | 49.0 | 2378 | 100.0 | 51.0 | 4659 | 100.0 |

As can be seen, the percentages of untrained students are very high, whether they belong to the Teacher's Degree in Pre-School Education or the Teacher's Degree in Primary Education, being practically the same. Specifically, 95.3% in the case of students in the Teacher's Degree in Pre-School Education compared to 95.0% in the Teacher's Degree in Primary Education.

If we observe non-degree education according to the type of university, as can be seen in Table 5, private universities have a slightly higher percentage of students with training outside the Degree (5.5%), in contrast to public universities (4.8%).

**Table 5.** Percentages and frequencies of training received outside the Teacher's Degree according to university type.

| Education Outside the Teacher's Degree | Public University | | | Private University | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % Pub. | % Spain | f | % Priv. | % Spain | f | % |
| Yes | 200 | 4.8 | 4.3 | 26 | 5.5 | 0.6 | 226 | 4.9 |
| No | 3983 | 95.2 | 85.5 | 450 | 94.5 | 9.7 | 4433 | 95.2 |
| Total | 4183 | 100.0 | 89.8 | 476 | 100.0 | 10.2 | 4659 | 100.0 |

### *3.2. Means of Training outside the Teacher's Degree for the Didactic Use of Film and Hours of Training Received*

Table 6 below shows the data, with multiple answers, on the means of training students of the Teacher's Degree outside their Degree studies for the didactic use of cinema. Training means belonging to formal, non-formal, and informal education are contemplated.

**Table 6.** Means of training students of the Teacher's Degree outside the Teacher's Degree for the didactic use of cinema.

| Training Resources Outside the Teacher's Degree | f | % |
|---|---|---|
| On-site or online courses or workshops | 69 | 17.6 |
| Conferences | 41 | 10.4 |
| Internet resources | 118 | 29.9 |
| Library and bookstore resources | 36 | 9.1 |
| Media | 63 | 16.0 |
| Master's Degree in Teacher Training | 2 | 0.5 |
| Ecclesiastical Declaration of Academic Competency (DECA) | 1 | 0.3 |
| Higher Technician in Pre-School Education | 16 | 4.1 |
| Postgraduate Programme International Educating Class | 1 | 0.3 |
| Bachelor's Degree in Journalism | 3 | 0.8 |
| At school | 3 | 0.8 |
| Bachelor's Degree in Fine Arts | 1 | 0.3 |
| Baccalaureate | 12 | 3.1 |
| Syllabus of public examination | 2 | 0.5 |
| Bachelor's Degree in Pedagogy | 2 | 0.5 |
| Higher Technician in Physical and Sports Activities Animation | 2 | 0.5 |
| Bachelor's Degree in Audiovisual Communication | 4 | 1.0 |
| Bachelor's Degree in Social Education | 2 | 0.5 |
| Active teachers | 1 | 0.3 |
| Higher Technician in Sociocultural Animation | 2 | 0.5 |
| Other Bachelor's Degree | 2 | 0.5 |
| Bachelor's Degree in Classical Philology | 1 | 0.3 |
| Bachelor's Degree in the Superior School of Dramatic Art | 1 | 0.3 |
| Higher Technician in Audiovisual and Show Project Production | 2 | 0.5 |
| Higher Technician in Photography | 1 | 0.3 |
| Volunteering | 1 | 0.3 |
| Erasmus Mundus Scholarship-European Master in Media Engineering for Education (EUROMIME) | 1 | 0.3 |
| Bachelor's Degree in Modern Languages | 1 | 0.3 |
| Music conservatory studies | 1 | 0.3 |
| Making off of the films on the DVDs | 1 | 0.3 |
| Pastoral theology education | 1 | 0.3 |
| Total | 394 | 100.0 |

As can be seen from the results presented, the most frequent means of training in the didactic use of film outside the Teacher's Degree are Internet resources, with 29.9%. Three other relevant means are face-to-face or online courses or workshops, the media, and conferences, used by 17.6%, 16%, and 10.4% of students, respectively. Other, although secondary, means used by students of the Teacher's Degree to train in the didactic use of

film are the resources of libraries and bookshops (9.1%) and higher-level training cycles (5.9%). Among the latter, it is worth mentioning the higher-level training cycle in Pre-School Education, through which 4.1% of students have received training. Likewise, 4.2% of students on the Teacher's Degree have been trained in the didactic use of cinema through other university Degrees they have taken. Some of these are Audiovisual Communication, Journalism, and Pedagogy. Finally, within non-university training, it is noteworthy that 3.9% were trained in compulsory education and the baccalaureate.

Regarding the results on the hours of training received outside the Teacher's Degree for the didactic use of film in Pre-School and Primary Education classrooms, 70.3% ($n$ = 159) of students have received between one and ten hours of training and 8% ($n$ = 18) from eleven to twenty hours.

### *3.3. Perceived Competence to Use Technological Tools in the Creation of Film Proposals*

In Table 7, the results in relation to the competence shown by the future teachers in the use of technological tools in the production of film proposals are presented.

**Table 7.** Percentages and frequencies of the competence to use technological tools in the creation of film proposals.

| Technology Tools | Not Competent | | Minimally Competent | | Moderately Competent | | Quite Competent | | Totally Competent | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | M | SD |
| Video camera | 115 | 2.5 | 675 | 14.5 | 1625 | 34.9 | 1390 | 29.8 | 854 | 18.3 | 3.47 | 1.02 |
| Photo camera | 59 | 1.3 | 400 | 8.6 | 1529 | 32.8 | 1887 | 40.5 | 784 | 16.8 | 3.63 | 0.90 |
| Mobile phone | 89 | 1.9 | 396 | 8.5 | 999 | 21.4 | 1699 | 36.5 | 1476 | 31.7 | 3.87 | 1.01 |
| Tablet | 181 | 3.9 | 728 | 15.6 | 1347 | 28.9 | 1509 | 32.4 | 894 | 19.2 | 3.47 | 1.08 |
| Editing software | 491 | 10.5 | 1161 | 24.9 | 1216 | 26.1 | 984 | 21.1 | 807 | 17.3 | 3.09 | 1.25 |
| Microphone | 476 | 10.2 | 1224 | 26.3 | 1374 | 29.5 | 910 | 19.5 | 675 | 14.5 | 3.01 | 1.20 |
| Sound recorder | 252 | 5.4 | 973 | 20.9 | 1556 | 33.4 | 1203 | 25.8 | 675 | 14.5 | 3.23 | 1.09 |

M = mean; SD = standard deviation.

As can be observed, 68.2% ($n$ = 3175) of students consider themselves to be quite or totally competent in using the mobile phone to make cinematographic works. It should also be noted that the photographic camera and the tablet are devices with which the majority of students perceive themselves to be quite and totally competent, with 57.3% (n = 2671) and 51.6% ($n$ = 2403), respectively. On the other hand, 36.5% ($n$ = 1700) and 35.4% ($n$ = 1652) of the students perceive themselves as little or nothing competent in using the microphone and the editing software.

### *3.4. Differences in Perceptions of the Educational Potential of Film, Taking into Account Whether or Not Training Has Been Received Outside the Teacher's Degree*

Table 8 shows the comparison of perceptions between students who have received training outside the Degree and those who have not.

**Table 8.** Results of the *t*-test for mean difference in perceptions between students who have received training outside the Teacher's Degree in the didactic use of film and those who have not received training.

| | Levene Test | | Education Outside the Teacher's Degree | No Education Outside the Teacher's Degree | | |
|---|---|---|---|---|---|---|
| Variable | F | P | M (SD) | M (SD) | t | P |
| Dimension 1 | 2.78 | 0.095 | 45.35 (8.24) | 43.83 (9.31) | 2.41 (46) | 0.016 |
| Dimension 2 | 5.07 | 0.024 | 41.02 (7.06) | 39.65 (8.47) | 2.82 (25) | 0.005 [1] |
| Dimension 3 | 1.30 | 0.253 | 39.45 (7.85) | 38.58 (8.40) | 1.51 (46) | 0.130 |

Dimension 1: Cinema as a transmitter of content; dimension 2: Cinema as expression and communication; dimension 3: Cinema as critical analysis. M = mean; SD = standard deviation, in parentheses. The degrees of freedom are indicated in parentheses next to the t value. [1] T-test for unequal variances.

The results show that students who have received training outside the Teacher's Degree perceive more educational potential in dimensions 1 and 2, with an increased mean of 45.35 and 41.02, respectively.

Regarding the desire to use film as a teaching resource in the classroom when becoming a teacher, 42.2% ($n$ = 1966) of the students quite agree to use film, 36.2% ($n$ = 1685) totally agree and 13.1% ($n$ = 612) sometimes agree. On the other hand, 1% ($n$ = 45) sometimes disagree, 4.7% ($n$ = 221) quite disagree, and 2.8% ($n$ = 130) totally disagree.

Table 9 below presents the results on the differences in the predisposition to the use of film depending on whether the student has received training outside the Teacher's Degree for its didactic application.

**Table 9.** Results of the *t*-test for the mean difference in the predisposition to the use of film between students who have received training outside the Teacher's Degree for the didactic use of film and those who have not received training.

| | **Levene Test** | | **Education Outside the Teacher's Degree** | **No Education Outside the Teacher's Degree** | | |
|---|---|---|---|---|---|---|
| Variable | F | P | M (SD) | M (SD) | t | P |
| Predisposition for cinema use | 0.179 | 0.673 | 5.14 (1.16) | 4.94 (1.18) | 2.45 (46) | 0.014 |

M = mean; SD = standard deviation, in parentheses. The degrees of freedom are indicated in parentheses next to the *t* value.

As can be appreciated, students who have received training are more likely to use film in their future teaching practice with a significance value of 0.014.

## 4. Discussion

The present study adopted a holistic approach to education and set out to determine the extent to which the future teachers in Spain receive training outside their undergraduate studies for the didactic application of cinema. In this vein, one of the findings was the high percentage of students (95.1%) who have not received specific training in the use of cinema as a didactic resource in the pre-school and primary school classrooms. In tune, other studies have found that future teachers do not have a high mean media literacy [52,54]. If we compare this result with that obtained by [18] for the training within the Teacher's Degree, we find that the percentage is equally high, although slightly lower (88.4%). Along the same lines, [84] found for the media education case that training received outside of the university is lower (38.2%). This fact can be attributed to the highly institutionalized and hierarchically structured nature of formal education that is predominant in the educational world [85]. In this sense, non-formal and informal education have complementary character and certifications of different value. This means that personal and economic factors and intentionality are more present. These factors condition the adoption by the student body of the means of training. On the other hand, the training deficiencies detected have negative consequences. This is because prior teacher training is one of the determining factors for curriculum development in the classroom [86]. In agreement with this, 75.1% of the students of the Teacher's Degree in Spain have stated that they quite agree or totally agree with the need to have more specific training to apply cinema in the classroom [18]. Along the same lines, [52,54,56] reflected the need to make up for deficiencies in media skills with specific literacy policies. However, students, as highlighted by [69], have a weekly habit of consuming films, which can be a way of accessing knowledge of the audiovisual medium. This can also be a stimulus to broaden training through non-formal and informal channels pointed out by several authors [19–22].

If we observe the different territories of Spain, it has been found that training is low in a fairly homogeneous way, although, in some autonomous communities, the percentage is slightly higher. In the case of training within the Teacher's Degree, as detected by [18],

the percentages are higher, but also more disparate, since the autonomous action of the universities has a broader scope among the student body. Likewise, it was found that La Rioja is the community with the most students with training outside the Degree, being at the same time one of the communities with the most training within the Degree [18]. In contrast, the Basque Country is the community with the least training outside the Degree and has the lowest percentage of students with training (3.8%) within the Degree [18]. In addition, it is the community with the lowest mean weekly film viewing in the student body [69]. It is, therefore, a particular case that requires a particularly relevant training intervention.

With respect to training according to the type of Teacher's Degree and the tenure of the university, as was the case with training within the Degree [18], these are no variables that cause notable differences, and the percentages are even more similar. However, the percentage of students in the Primary Education Teacher Degree with training is slightly higher. This fact is consistent, since cinema is an audiovisual medium that is more present in the Primary Education stage curriculum [19] and this is reflected in the preservice teacher training. On the other hand, the percentage of students with training in private universities is slightly higher. In this finding, it is worth bearing in mind that private universities design particular proposals that enhance the institutional brand. By means of market strategies, they seek to consolidate the service and educational offer and increase the added value for the customer and their feeling of loyalty [87]. The results are in line with the findings of another study [52] that found differences depending on the studies and identified greater media literacy in students from private universities.

In relation to the means used for training, it has become clear that they are numerous and diverse, covering formal, non-formal, and informal education. In this way, the means mostly used come from informal education. Among these, Internet resources, the media, library resources, and bookstore resources stand out. This accounts for 55% of the total. This discovery is in line with the majority use of the Internet and media among university students and the possibilities of developing learning through the network [88,89]. In the face of scarce formal training, the presence of media that provide access to information with immediacy and greater fluidity increases [90]. On the other hand, it is found that the main non-formal way is face-to-face or online courses or workshops (17.6%), the most common in the non-formal educational field [91]. Similarly, where more training is obtained in the formal sphere is in the higher-level training cycles, in accordance with its eminently practical nature and oriented to professional performance [91]. With respect to training hours, in accordance with the lower training received outside the Degree, fewer training hours are attended than within the Teacher's Degree. In this sense, 82.3% of the students have received between one and twenty hours of training within the degree [18].

If we consider the perceived competence of students to use technology tools in the creation of cinematographic proposals, competence is moderate. The insufficient training detected is manifested both in the degree of perceived competence and in the tools on which competence is perceived to be greater. These tools are the ones most frequently used in everyday activities but are less specifically cinematic in nature. In this aspect, the mobile phone is the most frequently used device outside the Teacher's Degree [92,93]. In particular, 31.7% of students consider themselves fully competent to use it to make films. In contrast, it is perceived to be less proficient in technologies such as video cameras, editing software, or microphones. The degree of competence detected coincides with the problems identified in future teachers to create new media content, although they have even more difficulties in analyzing media content [54].

As for the influence of training on perceptions, students who have received specific training outside the Teacher's Degree perceive significantly more potential in cinema as a resource for the transmission of content and as a resource for expression and communication. Nevertheless, the differences are not significant with respect to cinema as a resource for critical analysis. It is convenient to interpret this finding based on the contents of the training received and the nature of teaching in a degree program and outside of it. In this

sense, since it is a training that has been received mainly through non-regulated means, consequently, the dimension of more reflective learning is less present. This dimension aims, precisely, to make a critical reading of reality and of the information received through informal channels of communication. In this line, it should be noted that in [94] the authors did not find significant differences in the dimension of cinema as a resource for the transmission of contents according to the training received in the Degree. In contrast, differences were found according to cinematic habits. This reflects that the perceptions of this dimension are influenced to a greater extent by training outside the Degree and the film consumption habits of the students. Regarding the predisposition to use cinema, it was found that students with training are significantly more predisposed to use cinema in their future teaching practice. This finding shows that greater knowledge and handling of film and its educational use contributes to its subsequent application. In contrast, current training deficiencies are reflected in the occasional use of film by non-university teachers [30]. The high predisposition for the use of cinema is in line with the teachers' positive perception of media education to improve teaching tasks and meet educational objectives, even though it is recognized that the application of media is not without obstacles [58–62].

## 5. Conclusions

The following conclusions—drawn in response to the objectives of the study—are presented below:

1. Training outside the Teacher's Degree for the didactic use of film by future teachers in Spain is very scarce, being quite homogeneous in all territories and slightly higher for students of the Teacher's Degree in Primary Education and private universities.
2. The means of access to training are diverse, the most common being informal education, such as Internet resources or the media, and mostly between one and ten hours of training are received.
3. Students' competence in technological tools for the creation of film proposals is moderate, with the mobile phone being the device with which they perceive themselves to be most competent.
4. Students with training outside the Teacher's Degree perceive significantly greater potential in film as a resource for transmitting content and as a resource for expression and communication. Moreover, they are significantly more willing to use cinema in their future teaching practice.

In assessing the findings, the limitations of the study should be considered. In this respect, the non-participation of five private universities prevented the creation of a larger and more diverse sample of participants, including students from all Spanish universities. Likewise, due to the nature of the instrument used, unreflective or insincere completion of the questionnaire could have led to biased responses.

As far as future lines of research are concerned, it is proposed to progress deeper into the training offered in non-formal and informal education and to qualitatively analyze the specific training contents. This will make it possible to complement the results of this study and enrich the meanings.

The findings in this study make it advisable, at a practical level, to undertake actions to develop the training of students in the didactic use of cinema. To this end, it is essential that public administrations make a firm commitment to promote comprehensive policies that favor training in formal, non-formal, and informal education. These policies should be drawn up both at the national and regional level and with the participation of the different educational and cinematographic collectives. The actions to be undertaken should be based on the recognition of cinema as a fundamental element of culture, society, and individual and collective identity. At the same time, the opportunity of its educational use should be used to promote active citizenship. In the field of formal education, the curricular inclusion of film training content and the use of cinema as a didactic resource from the beginning of schooling to university and professional training should be encouraged. In the case of the Teacher's Degree, it could be integrated through a specific subject or in a transversal

way in different areas of knowledge. The training given should cover the three educational dimensions detected in cinema as a didactic resource: for the transmission of contents, for expression and communication, and for critical analysis [42]. In the field of non-formal education, universities should carry out complementary training actions, preferably with the collaboration of associations, private institutions, and other public institutions. Along these lines, they should organize courses and conferences, screenings of films programmed in cycles, film forums, make it possible to participate in film projects, etc. In the area of informal education, public administrations should effectively promote film production with special cultural value, the visibility of cinematographic diversity, develop policies to help film exhibitors, and maintain quality standards for content in the media.

**Author Contributions:** Conceptualization, A.L.-L.; methodology, A.L.-L.; software, A.L.-L. and G.L.; validation, A.L.-L.; formal analysis, A.L.-L. and G.L.; investigation, A.L.-L.; resources, A.L.; data curation, A.L.-L. and G.L.; writing—original draft preparation, A.L.-L. and A.L.; writing—review and editing, A.L.-L. and A.G.-C.; visualization, A.L.-L., and A.G.-C.; supervision, A.L.; project administration, A.L.-L. and A.L. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available upon reasonable request to the corresponding author.

**Acknowledgments:** The authors would like to thank the teachers who participated in the expert judgement and the teachers from the Spanish universities who collaborated in the dissemination of the PECID questionnaire.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Camarero, E.; Varona, D.; Fedorov, A. Alfabetización mediática y audiovisual para el empoderamiento y el cambio social: Resultados de proyecto nica (1° Fase). *Opción* **2017**, *33*, 160–189.
2. Ambròs-Pallarès, A. Cine, transmedia y educación: Relatos en pantalla. *Rev. D'innovació Recer. En Educ.* **2020**, *13*, 1–18.
3. Amar, V. *Comprender y Disfrutar el Cine. La Gran Pantalla Como Recurso Educativo*, 1st ed.; Grupo Comunicar Ediciones: Huelva, Spain, 2003.
4. Pérez García, Á.; Sacaluga Rodríguez, I.; Moreno Melgarejo, A. The development of the competency of "Cultural awareness and expressions" using movie-induced tourism as a didactic resource. *Educ. Sci.* **2021**, *11*, 315. [CrossRef]
5. Ortiz, M.B.A. Commercial Cinema as a learning tool in medical education, from potential medical students to seniors. *MedEdPublish* **2018**, *7*, 238. [CrossRef]
6. Caena, F. *Initial Teacher Education in Europe: An Overview of Policy Issues*, 1st ed.; European Commission: Brussels, Belgium, 2014.
7. Montero, L. La formación inicial, ¿puerta de entrada al desarrollo profesional? *Educar* **2002**, *30*, 69–89. [CrossRef]
8. Rebolledo, T. La formación inicial del profesorado de educación primaria y secundaria en Alemania, España, Finlandia, Francia y Reino Unido. Estudio comparado. *Rev. Española De Educ. Comp.* **2015**, *25*, 129–148.
9. Soto, E.; Maldonado-Ruiz, G.; Márquez-Román, A.; Peña, N. Reconstruyendo el conocimiento práctico en confinamiento. Una experiencia de enseñanza en la formación inicial de docentes. *RED Rev. De Educ. Distancia* **2021**, *65*, 13.
10. Manso, J.; Garrido-Martos, R. Formación inicial y acceso a la profesión: Qué demandan los docentes. *Rev. De Educ.* **2021**, *393*, 293–319.
11. Darling-Hammond, L.; Oakes, M. *Preparing Teachers for Deeper Learning*, 1st ed.; Harvard Education Press: Cambridge, MA, USA, 2019.
12. Cabero, J.; Barroso, J. La escuela en la sociedad de la información. La escuela 2.0. In *Nuevos Escenarios Digitales: Las Tecnologías de la Información y la Comunicación Aplicadas a la Formación y Desarrollo Curricular*, 1st ed.; Pirámide: Madrid, Spain, 2013; pp. 21–36.
13. CEDEFOP. *Terminology of European Education and Training Policy*, 1st ed.; Office for Official Publications of the European Communities: Luxembourg, 2008.
14. UNESCO. *International Standard Classification of Education*, 1st ed.; UNESCO: Paris, France, 2011.
15. Fernández, C.; Rodríguez, M.C. Educación formal, no formal e informal en el Espacio Europeo: Nuevas exigencias para los procesos de formación en educación. *Rev. Aula Abierta* **2005**, *85*, 45–56.

16. Gairín, J.; Feixas, M.; Guillamón, C.; Quinquer, D. La tutoría académica en el escenario europeo de la Educación Superior. *Rev. Interuniv. De Form. Del Profr.* **2004**, *18*, 61–77.
17. Lorenzo-Lledó, A.; Roig-Vila, R.; Lorenzo, G. Evaluación de los MOOC por estudiantes universitarios desde una perspectiva metodológica. *Publicaciones* **2018**, *48*, 401–414. [CrossRef]
18. Lorenzo-Lledó, A.; Lledó, A.; Lorenzo, G.; Pérez-Vázquez, E. Academic training in Spanish universities for the didactic use of cinema in pre-school and primary education. *J. Technol. Sci. Educ.* **2021**, *11*, 210–226. [CrossRef]
19. Lara, F.; Ruiz, M.; Tarín, M. *Documento Marco Sobre Cine y Educación*, 1st ed.; Academia de las Artes y las Ciencias Cinematográficas de España: Madrid, Spain, 2019.
20. Vallejo, A.; Peirano, M.P. Iniciativas de educación cinematográfica en los festivales de cine de Iberoamérica (2005–2019). *Arte Individuo Y Soc.* **2021**, *33*, 791–818. [CrossRef]
21. Moya, T. Iniciativa de alfabetización cinematográfica: Una cartografía metodológica actual de las entidades dedicadas a la film literacy con públicos no profesionales en España. *Rev. Fuentes* **2017**, *19*, 125–138.
22. Moya, T. Towards a film literacy canon: Identification and multicultural analysis of the contents used in film education with pre-university students in Spain. *Commun. Soc.* **2019**, *32*, 235–248.
23. British Film Institute. *Making Movies Matter*, 1st ed.; British Film Institute: London, UK, 1999.
24. British Film Institute. *Reframing Literacy*, 1st ed.; British Film Institute: London, UK, 2008.
25. British Film Institute. *Film 21 Century Literacy. Re/defining Film Education. Notes Towards a Definition of Film Education*, 1st ed.; British Film Institute: London, UK, 2012.
26. British Film Institute. *Screening Literacy: Executive Summary*, 1st ed.; British Film Institute: London, UK, 2012.
27. British Film Institute. *Moving Images in the Classroom*, 1st ed.; British Film Institute: London, UK, 2000.
28. British Film Institute. *Look Again! A Teaching Guide to Using Film and Television with Three-to Eleven-Year-Olds*, 1st ed.; British Film Institute: London, UK, 2003.
29. British Film Institute. *A Framework for Film Education*, 1st ed.; British Film Institute: London, UK, 2015.
30. Pérez-Tornero, J.M.; Martínez-Cerdá, J.-F.; Portalés Oliva, M.; Durán Becerra, T.; Peralta García, L.; Julià Cano, A.; Guardans, I.; Comenge, R.; Ros, L.; Pierobon, O.; et al. *Showing Films and Other Audiovisual Content in European Schools. Obstacles and Best Practices*, 1st ed.; European Commission: Brussel, Belgium, 2015.
31. UNESCO. *Media and Information Literacy: Curriculum for Teachers*, 1st ed.; UNESCO: Paris, France, 2011.
32. Pérez-Tornero, J.; Samy, T. La formación de profesores en educación en medios: Currículo y experiencias internacionales. *Comunicar* **2012**, *20*, 10–14. [CrossRef]
33. Wilson, C. Alfabetización mediática e informacional: Proyecciones didácticas. *Comunicar* **2012**, *39*, 15–24. [CrossRef]
34. Cicha, K.; Rutecka, P.; Rizun, M.; Strzelecki, A. Digital and media literacies in the Polish education system—Pre- and post-COVID-19 perspective. *Educ. Sci.* **2021**, *11*, 532. [CrossRef]
35. Dudin, M.N.; Afanasyev, V.V.; Afanaseva, I.V.; Rezakov, R.G. Formation of media education in Russia (from the Middle Ages to the present day). *Amazon. Investig.* **2019**, *8*, 674–687.
36. Jayachandran, J. Media literacy and education in India during times of communication abundance. *J. Creat. Commun.* **2018**, *13*, 73–84. [CrossRef]
37. Palsa, L.; Salomaa, S. Media literacy as a cross-sectoral phenomenon: Media education in Finnish ministerial-level policies. *Cent. Eur. J. Commun.* **2020**, *13*, 162–182. [CrossRef]
38. Sloboda, Z. Considering historical (dis) continuities of media (literacy) education in the Czech Republic for the future approach. *Commun. Today* **2018**, *9*, 4–19.
39. Fedorov, A.V.; Levitskaya, A.A. Comparative analysis of the development of mass media education in the Commonwealth of Independent States (CIS) countries. *Media Educ.* **2018**, *58*, 39–62.
40. Petranová, D.; Hossová, M.; Velický, P. Current development trends of media literacy in European Union countries. *Commun. Today* **2017**, *8*, 52.
41. McDougall, J.; Zezulkova, M.; Van Driel, B.; Sternadel, D. *Teaching Media Literacy in Europe: Evidence of Effective School Practices in Primary and Secondary Education*, 1st ed.; Publications Office of the European Union: Luxembourg, 2018.
42. Pereira, L.; Jorge, A.; Brites, M.J. Media education competitions: An efficient strategy for digital literacies? *Ital. J. Sociol. Educ.* **2017**, *9*, 77–92.
43. Zhang, L.; Zhang, H.; Wang, K. Media literacy education and curriculum integration: A literature review. *Int. J. Contemp. Educ.* **2020**, *3*, 55–64. [CrossRef]
44. Demidov, A.A.; Syrina, T.A.; Tretyakov, A.L. Development of digital skills and media education system: From the organization of environmental education of preschool children to the ICT competence of teachers. *Media Educ.* **2020**, *60*, 11–23.
45. Fedorov, A.; Levitskaya, A. Mass media literacy education in modern Russia. *Media Educ.* **2018**, *57*, 2.
46. Fedorov, A.V.; Levitskaya, A.A. Synthetic media education model used in Commonwealth of Independent States (CIS). *Media Educ.* **2019**, *59*, 30–36.
47. Gómez-Galán, J. Media education in the ICT era: Theoretical structure for innovative teaching styles. *Information* **2020**, *11*, 276. [CrossRef]
48. Reyna, J.; Hanham, J.; Meier, P.C. A framework for digital media literacies for teaching and learning in higher education. *E-Learn. Digit. Media* **2018**, *15*, 176–190. [CrossRef]

49. Cuervo Sanchez, S.L.; Foronda Rojo, A.; Rodriguez Martinez, A.; Medrano Samaniego, C. Media and information literacy: A measurement instrument for adolescents. *Educ. Rev.* **2021**, *73*, 487–502. [CrossRef]
50. Mateus, J.C.; Hernández-Breña, W. Design, validation, and application of a questionnaire on media education for teachers in training. *NAER J.* **2019**, *8*, 34–41. [CrossRef]
51. Simons, M.; Meeus, W.; T'Sas, J. Measuring media literacy for media education: Development of a questionnaire for teachers' competencies. *J. Media Lit. Educ.* **2017**, *9*, 99–115. [CrossRef]
52. Al-Omari, K.M.; Alomari, M.A.; Qazaqzeh, S.M. The degree of possessing media education skills among classroom student-teachers at yarmouk university. *Multicult. Educ.* **2021**, *7*, 42–51.
53. Carenzio, A.; Ferrari, S.; Rasi, P. Older people's media repertoires, digital competences and media literacies: A case study from Italy. *Educ. Sci.* **2021**, *11*, 584. [CrossRef]
54. Erdem, C.; Eristi, B. Paving the way for media literacy instruction in preservice teacher education: Prospective teachers' levels of media literacy skills. *Int. J. Instr.* **2018**, *11*, 795–810. [CrossRef]
55. Yu, O.A. Media literacy of schoolchildren in a post-transitive society: Study results. *Theor. Pract. Issues J.* **2019**, *8*, 747–762.
56. Rožukalne, A.; Skulte, I.; Stakle, A. Media education in the common interest: Public perceptions of media literacy policy in Latvia. *Cent. Eur. J. Commun.* **2020**, *13*, 202–229. [CrossRef]
57. Park, Y.M.; Chae, J.H.; Kim, S.K.; Kwon, H.S. The effects of media literacy education and its influence on digital citizenship: Focusing on CMF education programs in Korea. *J. Inf. Syst.* **2021**, *30*, 113–135. [CrossRef]
58. Corser, K.; Dezuanni, M.; Notley, T. How news media literacy is taught in Australian classrooms. *Aust. Educ. Res.* **2021**, *48*, 1–17. [CrossRef] [PubMed]
59. Hattani, H.A. Media literacy education in secondary school: Teachers' attitudes. *J. Media Res.-Rev. De Stud. Media* **2019**, *12*, 5–26. [CrossRef]
60. Maraver-López, P.; Caldeiro-Pedreira, M.C.; Pérez-Lisboa, S. Perception of media literacy and training in teachers from Chile. *Univeristas* **2017**, *XV*, 201–218.
61. Nettlefold, J.; Williams, K. News media literacy challenges and opportunities for Australian school students and teachers in the age of platforms. *J. Media Lit. Educ.* **2021**, *13*, 28–40. [CrossRef]
62. Vuojärvi, H.; Purtilo-Nieminen, S.; Rasi, P.; Rivinen, S. Conceptions of adult education teachers-in-training regarding the media literacy education of older people: A phenomenographic study to inform a course design. *J. Media Lit. Educ.* **2021**, *13*, 1–18.
63. Botturi, L. Digital and media literacy in pre-service teacher education. *Nord. J. Digit. Lit.* **2019**, *14*, 147–163. [CrossRef]
64. Ranieri, M.; Bruni, I.; Kupiainen, R. Digital and media literacy in teacher education: Findings and recommendations from the European Project e-MEL. *Ital. J. Educ. Res.* **2018**, *20*, 151–166.
65. Nicolaou, C.; Matsiola, M.; Kalliris, G. Technology-enhanced learning and teaching methodologies through audiovisual media. *Educ. Sci.* **2019**, *9*, 196. [CrossRef]
66. Masanet, M.; Ferrés, J. La enseñanza universitaria española en materia de educación mediática. *Commun. Pap.* **2013**, *2*, 83–90. [CrossRef]
67. López, L.; Aguaded, M. La docencia sobre alfabetización mediática en las facultades de educación y comunicación. *Comunicar* **2015**, *22*, 187–195.
68. Gozálvez, V.; Masanet, M.J.; Hernando, A.; Bernal-Bravo, C. Relación entre formación universitaria y competencia mediática del profesorado. *Rev. Complut. De Educ.* **2019**, *30*, 1113–1126.
69. Lorenzo-Lledó, A.; Lledó, A.; Pérez-Vázquez, E.; Lorenzo, G. Cinematographic habits of future spanish teachers from a socio-educational perspective. *Int. J. Environ. Res. Public Health* **2020**, *17*, 5361. [CrossRef]
70. Alaminos, A.; Castejón, J.L. *Elaboración, Análisis e Interpretación de Encuestas, Cuestionarios y Escalas de Opinión*, 1st ed.; Editorial Marfil: Alicante, Spain, 2006.
71. Bisquerra, R. *Metodología De La Investigación Educativa*, 6th ed.; La Muralla: Madrid, Spain, 2014.
72. León, O.G.; Montero, I. *Métodos de Investigación en Psicología y Educación*, 3rd ed.; McGraw-Hill: Madrid, Spain, 2003.
73. Albert, M.J. *La Investigación Educativa. Claves Teóricas*, 1st ed.; McGraw Hill: Madrid, Spain, 2007.
74. Lorenzo-Lledó, A. Design and validation of a questionnaire to measure future Spanish teachers' perceptions of cinema in pre-school and primary education: Towards active and technological learning. *Future Internet* **2020**, *12*, 149. [CrossRef]
75. Aguilar-Barojas, S. Fórmulas para el cálculo de la muestra en investigaciones de salud. *Salud En Tabasco* **2005**, *11*, 333–338.
76. Hyrkäs, K.; Appelqvist-Schmidlechner, K.; Oksa, L. Validating an instrument for clinical supervision using an expert panel. *Int. J. Nurs. Stud.* **2003**, *40*, 619–625. [CrossRef]
77. Barroso, J.; Cabero, J. La utilización del juicio de experto para la evaluación de TIC: El coeficiente de competencia experta. *Bordón Rev. Pedagog.* **2013**, *65*, 25–38.
78. Hernández-Nieto, R.A. *Contributions to Statistical Analysis*, 1st ed.; Universidad de Los Andes: Merida, Venezuela, 2002.
79. George, D.; Mallery, P. *SPSS for Windows Step by Step: A Simple Guide and Reference. 11.0 Update*, 4th ed.; Allyn & Bacon: Boston, MA, USA, 2003.
80. Cardona, M.C. *Introducción a los Métodos de Investigación en Educación*; EOS: Madrid, Spain, 2002.
81. Hu, L.T.; Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscip. J.* **1999**, *6*, 1–55. [CrossRef]
82. Munthén, L.K.; Munthén, B.O. *Mplus User's Guide*, 8th ed.; Munthén & Munthén: Los Ángeles, CA, USA, 1998–2017.

83. Hair, J.F.; Anderson, R.E.; Tatham, R.L.; Black, W.C. *Multivariate Data Analysis*, 5th ed.; Prentice Hall: New York, NY, USA, 1998.
84. Cabero Almenara, J.; Guerra Liaño, S. La alfabetización y la formación en medios de comunicación en la formación inicial del profesorado. *Educación* **2012**, *14*, 89–115. [CrossRef]
85. Latchem, C. Open and distance non-FORMAL education. In *Open and Distance Non-formal Education in Developing Countries*, 1st ed.; Springer Briefs in Education: Singapore, 2018; pp. 11–17. [CrossRef]
86. Shawer, S.F. Teacher-driven curriculum development at the classroom level: Implications for curriculum, pedagogy and teacher training. *Teach. Teach. Educ.* **2017**, *63*, 296–313. [CrossRef]
87. Sanz, D.; Crissien, T.; García, J.; Patiño, M. Marketing educativo como estrategia de negocio en universidades Privadas. *Desarro. Gerenc. Rev. Fac. Cienc. Económicas Adm. Contab. Univ. Simón Bolívar Colomb.* **2017**, *9*, 160–175.
88. Morales Ramírez, A.; Zacatenco Cruz, J.D.; Luna Luna, M.; García Lozano, R.Z.; Hidalgo Cortés, C. Acceso y actitud del uso de Internet entre jóvenes de educación universitaria. *Rev. Digit. De Investig. En Docencia Univ.* **2020**, *14*, 1174. [CrossRef]
89. Braasch, J.L. Advances in research on internal and external factors that guide adolescents' reading and learning on the Internet. *J. Study Educ. Dev.* **2020**, *43*, 210–241. [CrossRef]
90. Naumis Peña, C. Información en bibliotecas y archivos e Información en Internet. In *La Información Después de Internet: Repensando las Libertades, Amenazas y Derechos*; Universidad Nacional Autónoma de México: Mexico City, Mexico, 2021; pp. 21–37.
91. Valdés, M.T. Trayectorias escolares y expectativas del alumnado de Ciclos Formativos de Grado Medio: La elección de la vía profesional en un contexto de desprestigio consolidado. *Rev. Metamorf. Rev. Cent. Reina Sofía Sobre Adolesc. Juv.* **2019**, *10*, 52–76.
92. Nikolopoulou, K.; Gialamas, V.; Lavidas, K. Acceptance of mobile phone by university students for their studies: An investigation applying UTAUT2 model. *Educ. Inf. Technol.* **2020**, *25*, 4139–4155. [CrossRef]
93. Ruiz-Palmero, J.; Colomo-Magaña, E.; Sánchez-Rivas, E.; Linde-Valenzuela, T. Estudio del uso y consumo de dispositivos móviles en universitarios. *Digit. Educ. Rev.* **2021**, *39*, 89–104. [CrossRef]
94. Lorenzo-Lledó, A.; Lledó, A.; Lorenzo, G. Cinema as a transmitter of content: Perceptions of future Spanish teachers for motivating learning. *Sustainability* **2020**, *12*, 5505. [CrossRef]

education sciences

MDPI

*Article*

# The Development of the Competency of "Cultural Awareness and Expressions" Using Movie-Induced Tourism as a Didactic Resource

**Álvaro Pérez García [1,*], Ignacio Sacaluga Rodríguez [2] and Alberto Moreno Melgarejo [3]**

[1] Department of Didactics and School Organization, Faculty of Education, Universidad Internacional de La Rioja, 26006 La Rioja, Spain
[2] Department of Communication, Universidad Europea de Madrid, 28670 Madrid, Spain; ignacio.sacaluga@universidadeuropea.es
[3] Department of Education, Universidad Europea de Madrid, 28670 Madrid, Spain; alberto.moreno@universidadeuropea.es
* Correspondence: alvaro.perezgarcia@unir.net; Tel.: +34-616221808

**Abstract:** Competence in "Cultural awareness and expressions" requires very stimulating activities for its development, and cinema can be used as an interesting enhancer of educational action. The educational potential of the so-called movie-induced tourism, which has increased in recent years thanks to the impact of major productions such as *The Lord of the Rings*, *Star Wars* or *Game of Thrones*, could bring extra motivation when developing any competency including the aforementioned one. This article aims to suggest some keys on film tourism as a didactic resource and how destinations might capitalize on it through entrepreneurship. In doing so, educational establishments located within film destinations can carry out projects in this sense to work on the competence of "Cultural awareness and expressions". Thus, an example of didactic programming will be offered based on the creation of new tourist businesses to take advantage of *Lord of the Rings* saga filming in San Juan de Gaztelugatxe (Vizcaya, Basque Country, Spain).

**Keywords:** media education; movie-induced tourism; didactic resource; educational activities; competence development

**Citation:** Pérez García, Á.; Sacaluga Rodríguez, I.; Moreno Melgarejo, A. The Development of the Competency of "Cultural Awareness and Expressions" Using Movie-Induced Tourism as a Didactic Resource. *Educ. Sci.* **2021**, *11*, 315. https://doi.org/10.3390/educsci11070315

Academic Editors: Jose Ángel Martínez-López, Cristina Lázaro-Pérez, José Gómez Galán and James Albright

Received: 17 May 2021
Accepted: 21 June 2021
Published: 24 June 2021



## 1. Introduction

The Spanish education legislation Ley Orgánica 2/2006, de 3 de mayo, de Educación [1] included for the first time in the Spanish education system the development of basic competencies to work at the primary, secondary and baccalaureate levels, following the recommendations of the OECD's "Definition and Selection of Competencies" project [2]. Subsequently, "Ley Orgánica 8/2013, de 9 de diciembre, para la mejora de la calidad educativa" [3] reformulated the basic competencies, reducing their numbers from eight to seven, leaving the following remaining: Linguistic communication; Mathematical competency and basic competencies in science and technology; Digital competency; Learning to learn; Social and civic competencies; Sense of initiative and entrepreneurship; and Cultural awareness and expressions. More specifically, an approach on how to develop this last competency is addressed in the article. "Cultural awareness and expressions" is a key competency closely related to all cultural manifestations, including the seventh art.

Since its birth at the end of the 19th century, cinema has been used as a didactic tool to reinforce content, to boost creativity or to introduce students to audio-visuals, among other aspects [4]. Thus, it becomes a magnificent tool for working on a competency that is so closely related to visual and cultural manifestations. If we add tourism to these educational options offered by cinema, the teaching–learning process is enriched and provides great alternatives for teachers and students to focus on this competency.

For this reason, in this academic article we present the possibilities of using this new aspect of tourism, based on the use of the large film productions that have been shot in certain places, as a didactic-creative resource in order to make the most of it within the school environment.

To achieve this, the objectives of this article are defined, followed by a theoretical foundation in which we will describe what the competency of "Cultural awareness and expressions" consists of and how it might be developed. This article also refers to movie-induced tourism, its growth in recent years and how it can be used in education to work on competencies. Finally, a proposal of a didactic programme is presented in which the competency of "Cultural awareness and expressions" is addressed through movie-induced tourism.

## 2. Objectives

The main objective of this work is to expose the didactic-creative possibilities of movie-induced tourism to work on "Cultural awareness and expressions". Thus, this main objective can be broken down into the following objectives that are more specific:

− To define the competency of "Cultural Awareness and expressions" and how it might be developed.
− To situate the concept of movie-induced tourism from different perspectives.
− To use film tourism for didactic purposes through the creation of a didactic programme to work on the competency of "Cultural Awareness and expressions".

## 3. Methodology

The methodology is based on the analysis of experiences and the evaluation of training programmes. Bibliographic research is used in order to establish a state-of-the-art didactic resource using both film tourism and cinema. From this point, the information is used to articulate a didactic programme contributing to work on the competency of "Cultural awareness and expressions" through film tourism.

The research questions for the article are as follows:

- Is movie-induced tourism valued in the academic field?
- Can movie-induced tourism be a good resource for working on competencies in education?
- Are there any educational experiences in which movie-induced tourism has been used?

## 4. Theoretical Background

### *4.1. The Competency of "Cultural Awareness and Expressions"*

According to the Spanish educational legislation "Orden ECD/65/2015, de 21 de enero" describing the relationships between the competencies, the contents and evaluation criteria of primary education, compulsory secondary education and baccalaureate education, the competency of "Cultural awareness and expressions" implies knowing, understanding, appreciating and valuing, with a critical spirit and an open and respectful attitude, different cultural and artistic manifestations, using them as a source of personal enrichment and enjoyment and considering them as part of the wealth and heritage of peoples [5]. In addition, this competency also incorporates an expressive component referring to one's own aesthetic and creative capacity and to the mastery of those skills related to the different artistic and cultural codes, using them as a means of communication and personal expression. It also implies showing interest in participating in cultural life and in contributing to conservations of cultural and artistic heritage, both of your own community and of other communities [5].

Therefore, this competency entails cultural manifestation development contributing to the preservation of our history and heritage. Moreover, authors such as Sánchez Arjona et al. [6] work on this competency to educate in values; specifically, they carried out a project to stop the rejection of Arab descent students after the Islamist attacks in Paris. On the other hand, Naranjo López [7] used the website of the Prado Museum in Madrid to develop this competency. Through the contribution of foreign travelers, Salido and Salido [8] used travel

literature to analyse and present its didactic possibilities for working on the competency of "Cultural awareness and expressions". Moreover, Rodríguez Torres [9] talks about the need to propose new meanings and approaches when working on the competency in cultural awareness and expression in teacher training.

Therefore, the competency of "Cultural awareness and expressions" is a key and necessary competence to develop in children and adolescents. Consequently, film tourism, due to its attractiveness for the new generations, contributes to the development of this competency from a motivating and creative approach.

### *4.2. Movie-Induced Tourism*

The new tourism trend based on visiting places or locations where a cult series or film was shot has been called "movie-induced tourism" [10]. González Conde et al. [11] define this term as the tourism that follows the success of a film or series in the place where it was filmed. This typology arose at the end of the 20th century due to people's interest in finding out where their favourite film was shot. "Movie-induced tourism" as an emerging tourism product should be understood as a typology of popular cultural tourism, as it responds to a phenomenon usually caused by the commercial success of films or series [12].

The bidirectional relationships between landscapes, locations, film and tourism have been addressed from different academic disciplines [13]. Rodríguez Campo et al. [14] include movie-induced tourism as an emerging typology of cultural tourism, which becomes an important factor in achieving good online reviews of tourism services and destination evaluation [15].

Busby and Klug [16] point out a series of types and characteristics that define movie-induced tourism: (a) Film location as a tourism attraction on its own right. On the one hand, there are places not considered as tourist destinations until they were seen on screen, while others were already perceived as such. (b) Movie-induced tourism as part of a mainstream holiday. Some tourists will visit the place that appears on TV or in the cinema or book a film tour while on holiday, without prior knowledge of the place. (c) Movie-induced tourism, which occurs as the sole and main purpose outside of special interests. This is the booking of a holiday to a specific destination as a direct result of screening. (d) Movie-induced tourism packages developed by the private sector: Bus companies and tour operators build specific packages. Icons serving on movie-induced tourism considered by tourists as key attractions of their visits might be natural scenery, historical background, actors, symbolic content and human relationships. (e) Movie-induced tourism at locations where filming is believed to have taken place. Visitors come to the locations even if the film depicts a different real-life setting. (f) Movie-induced tourism as part of the romantic gaze. Romantic tourists tend to focus on places that have been constructed and reinforced by television and film in solitude and privacy, establishing a semi-spiritual relationship with the place being shown. (g) Movie-induced tourism for reasons of pilgrimage, nostalgia and escape. This type of tourism takes the visitor away from the mundane reality of everyday life. The movie sites of films such as Field of Dreams (1989) and Steel Magnolias (1989) became pilgrimage sites in their own right.

Many authors have been studying this phenomenon in recent years, praising the possibilities from different countries [17,18]. In this sense, Pereira and Moraes [19] conducted interesting research with film students and the vision offered by Brazilian national cinema about the northwest region of the country and its repercussions on tourism. Figueira et al. [20] observed something similar with the Portuguese region of Alentejo. Soares Da Mata Nunes [21] focused on analysing the influence of cinema and television on the positioning and image of some places and to what extent they contribute to choose a tourist destination [22]. Millán et al. [23] carried out a study to evaluate the effects of a film route based on the Spanish movie *Amanece, que no es poco* to analyse the benefits both in terms of the number of visitors and the economic aspect.

Another example of the economic repercussions of a film for a locality is shown by Torres-Romay et al. [24] with the case study of the small Cantabrian town of Comillas,

where the film *Primos* (Sánchez Arévalo, 2011), a Spanish feature film with the highest revenue in the year of its release, is mostly located. Aersten [25] pointed out that by analysing a specific film text, different narrative strategies can be established through which it acquires the function of a promotional text for a specific tourist destination. In the case of his research, it was the city of Barcelona through Woody Allen's film *Vicky, Cristina, Barcelona* (2008).

With respect to film festivals, they also attract a large amount of tourism to the localities hosting them. Thus, Flores Ruiz [26] analysed the case of the Huelva Ibero-American Film Festival, concluding that the economic benefits of organising this event outweigh the costs.

Notwithstanding, other terms related to movie-induced tourism have also emerged, such as "city placement". This refers to the placement of cities, regions, monuments, tourist sites and accommodation and catering businesses in an audiovisual production in exchange for help in the funding, filming or promotion of the film, and with a view to promoting tourism, improving its image abroad or the economic benefits that any filming entails [27].

Cádiz is also a highly visited city for its culture and beaches, but also as a film location, as Grande-López [28] points out. To conclude this overview of the studies carried out on film tourism, we will look at two experiences that focus on the Andalusian town of Osuna and the impact of filming the *Game of Thrones* series. On the one hand, Seño Asencio [29] pointed out the growth that a town such as Osuna, which had already been a filming location for other films and series, noticed an increase in tourist arrivals after filming the HBO blockbuster. It is remarkable to point out that previous productions did not reach the same effect. Ramos Lobo and Pedregal Mateos [30] used big data to analyse the tourist trend generated by the announcement in 2014 that Osuna would be one of the filming destinations for *Game of Thrones*. They probed that the trend of Google searches for terms related to the town and the filming of the series led to an increase in tourist visits to this Andalusian town.

Film tourism is booming thanks to the love of series and blockbusters. Teenagers and children feel identified with them and, therefore, it can become a very motivating resource to work in education and, specifically, to work on "Cultural awareness and expressions".

### *4.3. Movie-Induced Tourism and Competency Education*

After defining the competency of "Cultural awareness and expressions" and introducing movie-induced tourism trend, we focus on the combination of both aspects to point out the didactic-creative possibilities that movie-induced tourism can offer to work in education.

It should be mentioned that tourism and education have a consolidated relationship [31–33]. It is also important to highlight the need for teachers, who are going to implement these experiences, to have a highly developed digital competence [34,35].

In this sense, we can start from previous experiences such as those already mentioned, where the competency was developed from different approaches [6–8]. Nevertheless, in this article we specifically focus on how to develop competencies through movie-induced tourism.

Although there are few previous experiences found in literature, we highlight the contribution of Pérez García [4] based on the repercussions that *Game of Thrones* had in the town of Osuna to develop an educational activity for the fourth year of Compulsory Secondary Education. It had the approach of an Integrated Didactic Unit entitled "Game of Thrones" based on the creation of businesses focus on monetizing film tourism in Osuna. In doing so, the areas of "Initiation to Entrepreneurship and Business Activity", "Plastic, Visual and Audiovisual Education" and "Economics" were integrated in a holistic approach within the activity.

Fernández Pérez [36] researched the curious case of Júzcar, "the Smurf village", a town in Malaga that used the attraction of the children's series "The Smurfs" to paint the whole town blue and turn it into a large theme park dedicated to these characters. Many educational establishments made experiences in this town through film tourism.

Therefore, movie-induced tourism can be an excellent didactic tool for working on educational skills due to its visual power, its up-to-date nature, its global approach, its capacity to confront the past and the future or its relationship with one of the main hobbies of children and adolescents. All these reasons explain why using active methodologies makes it much more motivating and attractive for students.

Finally, we make a proposal for a didactic programme serving as a practical example to develop "Cultural awareness and expressions" through movie-induced tourism.

## 5. Proposal for a Didactic Project *The Lord of the Rings*

One of the objectives in this article was sharing a proposal for a didactic project based on the development of the competency of "Cultural awareness and expressions" through activities related to film tourism. Firstly, a definition of a didactic programme is presented. Classroom planning is the third and last step within the curricular concretion and refers to the planning of the didactic action throughout the school year addressing the following curricular aspects: "what to teach", "how to teach" and "what, when and how to evaluate". It must be adapted to the group of students and the academic year. Therefore, it refers to the annual planning that the teacher carries out at the beginning of the academic year to establish the fundamental aspects of the teaching–learning process. Thus, his or her didactic action will be based respecting the academic year particularities in which he or she is teaching.

In cases where the teacher bases his or her planning and classroom action based on a textbook for each subject area, it is the textbook (and the publisher) which determines the guidelines for classroom planning. The opposite situation arises when the teacher himself/herself draws up his/her own lesson plan. In this case, regardless of the option chosen for planning (whether didactic units, projects, etc.), the planning will be carried out according to the needs and characteristics of the students in his or her group. Classroom planning brings together the set of integrated teaching units, work projects, research projects, etc., designed by a specific teacher. Therefore, the integrated teaching unit, work project or research project will be the specific element of classroom planning for a given time and subject sequence. The different curricular elements will be planned according to the central task of the chosen planning unit in order to achieve the assessment criteria through the development of content and the competencies achievements. The role of the assessment criteria is fundamental in the programming in order to evaluate the degree of acquisition of the key competencies and the objectives achievement. Based on them, the assessment indicators are set.

This project has not yet been carried out, so we have no results. Therefore, what is presented below is a proposal based on the experience of many years working under the PBL (Project Based Learning) methodology. We have searched for other similar projects, in order to establish comparisons, but we have only found the research by Pérez García [4]. We have found works on the use of film as a resource for working on history and heritage, including Muñoz García and Jiménez Pablo [37], Novillo [38] and an interesting experience on archaeology and heritage seen from the comic [39].

The programme presented is entitled "The Lord of the Rings" and is aimed at Secondary Education. Specifically, it will be carried out in the fourth year of Compulsory Secondary Education in a public secondary school in the town of San Juan de Gaztelugatxe, in Vizcaya, Basque Country. The school has three lines in Secondary Education with a total of 60 students who will carry out the project. The programme will consist of the creation of a tourist company to take advantage of the success of J.R.R. Tolkien's saga in this town, where some scenes of the film were shot.

In this sense, the selection of assessment criteria will be based on official education legislation [40]. This legislation proposes designing a business project in the classroom describing the internal characteristics and its relationship with the environment as well as its social function, identifying the structuring elements and its logistics network such as suppliers, customers, production, storage and marketing systems. Students need to

define how production is carried out and specific marketing activities for the company must be defined through applying communication and teamwork techniques. They also need to describe the different types of companies and the legal forms of companies, their capital requirements and the legal responsibilities of their owners and managers as well as the interrelationships of companies with other stakeholders. Other tasks would require analysing the main characteristics of the production process; making creative compositions from codes used in each audiovisual language, showing interest in the technological advances linked to these languages; identifying the different elements making up audio-visual basic narrative and expressive structure and multimedia language; correctly describing the necessary steps for the production of an audio-visual message; and valuing teamwork.

With regard to the elements to be tackled in this programme, the following would be considered: (a) the idea of the company project; (b) the environment; (c) the social role of the company; (d) the elements and structure of the company; (e) the business plan; (f) the commercial and marketing structure; (g) the aid and support for the creation of companies; (h) the types of companies, legal forms, functions and objectives; (i) the production process and production factors; (j) sources of funding; (k) income, costs and profits; and (l) the tax obligations of companies.

Finally, learning standards to be assessed include the following criteria:

(a) business project proposal opportunity and relevance;
(b) the relationship of the business project with its sector, its organisational structure and the functions of each department identifying the working procedures in the development of the productive or commercial process;
(c) creating materials for the dissemination and advertising the company project products and/or services, including an online communication plan and social networks applying marketing principles;
(d) explaining the possibilities of the day-to-day financing of companies, differentiating between external and internal, short- and long-term financing, as well as the company's running costs;
(e) distinguishing the different legal forms of companies and relating them to the capital requirements for their constitutional and legal responsibilities for each type;
(f) assessing the most appropriate legal forms of companies in each case according to the specific characteristics applying the reasoning on the classification of companies;
(g) identifying the different types of companies and entrepreneurs operating in their environment as well as the way of interrelating with stakeholders considering social and environmental effects;
(h) producing digital images using different computer drawing programmes;
(i) designing advertising using the different elements of the graphic-plastic language;
(j) following the outline of the creation process.

The main key competencies defined in the Spanish educational legislation [5] that could be acquired in this work project are: "Cultural awareness and expressions", "Linguistic communication", "Social and civic competencies", "Digital competency" and "Sense of initiative and entrepreneurship".

Regarding the tasks to work on these curricular aspects, a final project could be proposed related to making a promotional video to increase tourism in the town of San Juan de Gaztelugatxe aiming to promote the company created by the students.

Considering the specific learning activities, they will all be included in a gamified narrative such as *The Lord of the Rings* saga as main plot. This will be highly motivating, since, as Lauret and Bayram-Jacobs [41] point out, new methods need to be introduced to engage learners in the aftermath of the pandemic. The outcome to be achieved includes devising a tourism promotion strategy; studying the tourism potential of the town of San Juan de Gaztelugatxe; structuring market studies; scriptwriting, recording and editing audiovisual outcomes; and critical analyses of advertisements. This would also take advantage of the use of ICT to work on tourism [42].

Finally, the didactic programme would end with the evaluation carried out by means of an analytical rubric including all the evaluation criteria previously mentioned. In addition, a continuous evaluation approach will be apply taking advantage of gamification including several rewards, rankings and badges throughout the project.

## 6. Conclusions

Since the enactment of the latest legislation in 2015 [5], the competencies development approach has been consolidated in the Spanish education system following OECD recommendations. The competency of "Cultural awareness and expressions" has a certain complexity when it comes to being tackled within the class as it requires active, attractive and motivating methodologies for students to comprehensively develop it. This competency focusses on the appreciation of culture, history and traditions; consequently, it finds a great didactic resource in cultural tourism. Moreover, the large development of film tourism attracts many tourists including young people and teenagers. Thus, we have combined successful elements in a useful educational tool to develop this competence. The main objective of this article was to expose the didactic-creative possibilities of film tourism to work on this competency considering several perspectives [6–9]. The concept of film tourism has also been situated from the vision of different authors [11,12,16,19,20]. Finally, the design of a didactic programme to work on the competency of "Cultural awareness and expressions" was presented based on Pérez García's [4] approach.

Thus, the article proposed the articulation of a didactic programme considering different forms such us integrated teaching units, work projects and integrated tasks. In doing so, students might find motivation during the learning process encouraging audio-visual project outcomes and entrepreneurship from a constructivist perspective.

Regarding whether film tourism is valued in academia, it has been seen throughout this article that more and more articles are highlighting this field [12,15,17,18,28].

We also questioned whether film tourism could be a good resource for working on skills in education. The design and implementation of the educational project on *The Lord of the Rings* shows that it can be a very positive resource due to its didactic-creative potential. Finally, we investigated whether there are many projects of this type, and just a few were found, increasing usefulness of our contribution.

The implementation of educational programmes related to film tourism in schools within destinations offering well-known filming sites will help students to learn more about their own history and culture as well as to value and respect their heritage. It will also contribute to the promotion of their municipalities from the creation of audio-visual outcomes while achieving higher competency in "Cultural awareness and expressions".

The article has explored the great didactic and creative possibilities of using film tourism in the educational sphere to develop competencies. Moreover, proposals for the future related to the subject have also arisen. Considering the great negative impact that tourism sector has suffered due to the pandemic, the creation of new businesses focusing on enhancing film tourism for educational purposes may be one additional leverage to face the future economic development.

**Author Contributions:** Conceptualization, Á.P.G.; methodology, Á.P.G. and I.S.R.; validation, Á.P.G., I.S.R. and A.M.M.; formal analysis, A.M.M.; investigation, Á.P.G.; resources, Á.P.G., I.S.R. and A.M.M.; data curation, Á.P.G., I.S.R. and A.M.M.; writing—original draft preparation, Á.P.G.; writing—review and editing, Á.P.G., I.S.R. and A.M.M.; visualization, Á.P.G., I.S.R. and A.M.M.; supervision, Á.P.G., I.S.R. and A.M.M.; project administration, I.S.R. and A.M.M.; funding acquisition, I.S.R. and A.M.M. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the European University of Madrid through the MIECAT project (Methodology of Interpretation of European Cultural Heritage through Attractions in Tourism).

**Conflicts of Interest:** The authors declare no conflict of interest.

## References


1. De España, G. Ley Orgánica 2/2006, de 3 de mayo, de Educación. *Boletín Oficial del Estado* **2006**, *106*, 17158–17207.
2. DeSeCo. *Key Competencies for a Successful Life and Well-Functioning Society*; Final Report; OCDE: Paris, France, 2013.
3. De España, G. Ley Orgánica 8/2013, de 9 de Diciembre, para la Mejora de la Calidad Educativa. Boletín Oficial del Estado. 2013. Available online: www.boe.es/diario_boe/txt.php (accessed on 25 April 2021).
4. Pérez García, Á. El turismo cinematográfico como recurso didáctico: El caso de juego de tronos en Osuna (Sevilla). In Proceedings of the ICONO14—VI Congreso Internacional Ciudades Creativas, Orlando, FL, USA, 24–25 January 2018; pp. 743–754.
5. De España, G. Orden ECD/65/2015, de 21 de enero, por la que se describen las relaciones entre las competencias, los contenidos y los criterios de evaluación de la educación primaria, la educación secundaria obligatoria y el bachillerato. *Boletín Oficial del Estado* **2015**, *25*, 6986–7003.
6. Sánchez Arjona, M.D.; Gómez del Águila, L.M.; Gutiérrez-Pérez, R. La Competencia Conciencia y Expresión Cultural para poner en valor la herencia literaria medieval hispano-árabe en un contexto educativo Intercultural. *Tercio Creciente* **2018**, *13*, 57–78.
7. Naranjo López, R. La web del Museo del Prado para el desarrollo de la competencia conciencia y expresiones culturales. In *TIC Actualizadas para una Nueva Docencia Univesitaria 2016*; Durán Medina, J.F., Durán Valero, I., Eds.; McGrawHill: Madrid, Spain, 2016; pp. 567–574.
8. Salido López, P.V.; Salido López, J.V. Miradas artísticas en la literatura de viajes: Competencia en conciencia y expresiones culturales. *Opción Rev. Cienc. Hum. Soc.* **2015**, *1*, 772–789.
9. Rodríguez Torres, J. Competencia en conciencia y expresión cultural en la formación docente: Necesidad de nuevos significados y planteamientos. In *Proceedings Congreso CUICIID 2017*; Caldevilla Domínguez, D., Ed.; Fórum XXI: Madrid, Spain, 2017; p. 950.
10. Gjorgievski, M.; Melles Trpkova, S. Movie induced tourism: A new phenomenon. *UTMS J. Econ.* **2012**, *3*, 97–104.
11. González Conde, A.; Araújo Vila, N.; Rodríguez Campo, L. Turismo cinematográfico: La conquista on line de nuevos mercados. *Rotur Revista de Ocio y Turismo* **2015**, *9*, 17–34. [CrossRef]
12. Bosh Roig, G.I. Rutas de cine, el turismo cinematográfico en Mallorca: El caso alemán. *Pasos Revista de Turismo y Patrimonio Cultural* **2018**, *16*, 843–854. [CrossRef]
13. Tovar Cabañas, R.; Jáuregui Díaz, J.A.; Vázquez Espinosa, S.A. Influencia del cine en el turismo. *Periplo Susten Table* **2019**, *38*, 242–259. [CrossRef]
14. Rodríguez Campo, L.; Fraiz Brea, J.A.; Alén González, E. El turismo cinematográfico como tipología emergente del turismo cultural. *Pasos Revista de Turismo y Patrimonio Cultural* **2014**, *12*, 159–171. [CrossRef]
15. Zelenka, J.; Azubuike, T.; Pásková, M. Trust Model for Online Reviews of Tourism Services and Evaluation of Destinations. *Adm. Sci.* **2021**, *11*, 34. [CrossRef]
16. Busby, G.; Klug, J. Movie-induced tourism: The challenge of measurement and other issues. *J. Vacat. Mark.* **2001**, *7*, 316–332. [CrossRef]
17. Tuen-Man, N.; Chung-Shing, C. Investigating film-induced tourism potential: The influence of Korean TV dramas on Hong Kong young adults. *Asian Geogr.* **2020**, *37*, 53–73.
18. Nakayama, C. Film-Induced Tourism Studies on Asia: A Systematic Literature Review. *Tour. Rev. Int.* **2021**, *25*, 63–78. [CrossRef]
19. Pereira Neto, F.S.; Moraes Schmidlin, I.O. Turismo induzido por filmes: A imagem do nordeste propagada pelo cinema brasileiro no ponto de vista do estudante de cinema no ceará. *PODIUM Sport Leis. Tour. Rev.* **2013**, *2*, 1–31. [CrossRef]
20. Figueira, A.P.; Figueira, V.; Monteiro Carlos, S. Turismo e cinema: A importância de uma film commission na promoção do destino Alentejo. *Int. J. Sci. Manag. Tour.* **2015**, *1*, 29–37.
21. Soares Da Mata Nunes, S.A. Los Destinos Turísticos en las Producciones de Cine y Televisión. Influencia en su Notoriedad e Imagen de Marca y en la Elección del Consumidor 2016. Ph.D. Thesis, University of Extremadura, Badajoz, Spain, 2017.
22. Fondevila-Gascón, J.F.; Mir-Bernal, P.; Barrientos-Báez, A.; Perelló-Sobrepere, M. Huella cinemática en las redes sociales: Un análisis comparativo. *Fotocinema Revista Científica de Cine y Fotografía* **2021**, *22*, 427–445. [CrossRef]
23. Millán, Á.; García, J.A.; Díaz, E. Film-induced tourism: A latent class segmentation based on satisfaction and future intentions. *Pasos Revista de Turismo y Patrimonio Cultural* **2016**, *14*, 875–888. [CrossRef]
24. Torres-Romay, E.; Ramahí García, D.; García Mirón, S. Una aproximación a las nociones del turismo cinematográficamente inducido y emplazamiento de lugar. El caso de Primos (Daniel Sánchez Arévalo, 2011). In *La Pantalla Insomne 2016*, 2nd ed.; Ampliada Mateos, C., Herrero, F.J., Eds.; University of La Laguna: Laguna, Spain, 2016; pp. 1339–1363.
25. Aersten, V.U. El cine como inductor del turismo. La experiencia turística en Vicky, Cristina, Barcelona. *Razón Palabra* **2011**, *77*, 3829930.
26. Flores Ruiz, D. Turismo cinematográfico y desarrollo económico local. El festival de cine de Huelva. *Cuadernos de Turismo* **2015**, *36*, 175–196. [CrossRef]
27. Mendiz Nogueró, A. Emplazamiento de ciudades en el cine ("City placement"): Una estrategia de doble sentido entre la producción cinematográfica y la industria del turismo. In *Actas–III Congreso Internacional Latina de Comunicación Social-III CILCS-Universidad de la Laguna*; University of La Laguna: Santa Cruz de Tenerife, Spain, 2011.
28. Grande-López, V. El cine made in Cádiz es un gran invento. *Periférica* **2018**, *19*, 271–281. [CrossRef]
29. Seño Asensio, F. Una aproximación al turismo inducido por el cine. El caso de Osuna y Juego de Tronos. *Cuadernos de los Amigos de los Museos de Osuna* **2015**, *17*, 164–168.

30. Ramos Lobo, J.; Pedregal Mateos, B. Big Data y turismo cinematográfico: ¿Un factor de predicción? El caso de Juego de Tronos en Osuna. In *Impulso al Desarrollo Económico a Través del Turismo: VIII Jornadas de Investigación en Turismo 2015*; Jiménez-Caballero, J.L., Ed.; Iris-Copy: Sevilla, Spain, 2015; pp. 233–256.
31. Caldevilla-Domínguez, D.; Barrientos-Báez, A.; Padilla-Castillo, G. Twitter as a tool for citizen education and sustainable cities after COVID-19. *Sustainability* **2021**, *13*, 3514. [CrossRef]
32. Barrientos-Báez, A.; Caldevilla-Domínguez, D.; Peña Acuña, B. Grado de Turismo: Una reformulación educativa. In *Innovación Universitaria: Reformulaciones en la Nueva Educación 2021*; López-Meneses, E., Barrientos-Báez, A., Caldevilla-Domínguez, D., Peña-Acuña, B., Eds.; Octaedro: Barcelona, Spain, 2021; pp. 9–21.
33. Pérez García, Á.; Camaño-Franco, I.; García Abad, L. Educación en Turismo: Evolución y tendencias en las áreas de investigación y conocimiento abordados en Tesis, Trabajos Fin de Máster y Trabajos Fin de Grado. El caso de la Universidade da Coruña (UDC). In *Perspectivas Españolas en la Educación: Mejores Prácticas para el Siglo XXI 2020*; Von Feigenblatt, O., Peña Acuña, B., Eds.; Catholic University of New Spain: Miami, FL, USA, 2020; pp. 203–234.
34. Barquero, J.D.; Cancelo Sanmartín, M.; Rodríguez Segura, L. Las competencias digitales como vehículo de la cultura organizacional universitaria. *Revista Latina de Comunicación Social* **2021**, *79*, 17–33. [CrossRef]
35. Pérez García, Á. Las metodologías activas y su utilización en la enseñanza universitaria online. In *Innovación Universitaria: Reformulaciones en la Nueva Educación 2021*; López-Meneses, E., Barrientos-Báez, A., Caldevilla-Domínguez, D., Peña-Acuña, B., Eds.; Octaedro: Barcelona, Spain, 2021; pp. 71–84.
36. Fernández Pérez, J. Caso de éxito: Campaña de la película Los Pitufos en 3D. El impacto de un pueblo pintado de azul. *MK Mark. Ventas* **2013**, *290*, 8–14.
37. Muñoz García, G.; Jiménez Pablo, E. El cine histórico en el ámbito educativo: Discursos culturales ante el encuentro con América. *Área Abierta* **2021**, *21*, 9–24. [CrossRef]
38. Novillo López, M.Á. La aplicación didáctica del cine en el aula. *Padres Maest.* **2020**, *383*, 19–24. [CrossRef]
39. Becerra Romero, D.; Jorge Godoy, S. Descubrimiento y aprendizaje: La Arqueología y el Patrimonio vistos desde el cómic. *Tebeosfera Cult. Gráfica* **2019**, *10*, 12.
40. De España, G. Real Decreto 1105/2014, de 26 de Diciembre, por el que se Establece el Currículo Básico de la Educación Secundaria Obligatoria y del Bachillerato. Available online: https://www.boe.es/boe/dias/2015/01/03/pdfs/BOE-A-2015-37.pdf (accessed on 27 April 2021).
41. Lauret, D.; Bayram-Jacobs, D. COVID-19 Lockdown Education: The Importance of Structure in a Suddenly Changed Learning Environment. *Educ. Sci.* **2021**, *11*, 221. [CrossRef]
42. Caldevilla-Domínguez, D.; Martínez-Sala, A.-M.; Barrientos-Báez, A. Tourism and ICT. Bibliometric Study on Digital Literacy in Higher Education. *Educ. Sci.* **2021**, *11*, 172. [CrossRef]

education sciences

MDPI

Article

# Assessment of Digital Competencies of University Faculty and Their Conditioning Factors: Case Study in a Technological Adoption Context

**Javier Jorge-Vázquez [1,*], Sergio Luis Náñez Alonso [1,*], Washington Raúl Fierro Saltos [2,*] and Silvia Pacheco Mendoza [3]**

[1] DEKIS Research Group, Department of Economics, Catholic University of Ávila, 05005 Avila, Spain
[2] Faculty of Administrative Sciences, State University of Bolivar, Guaranda 020101, Ecuador
[3] Faculty of Education Sciences, State University of Bolivar, Guaranda 020101, Ecuador; spacheco@ueb.edu.ec
* Correspondence: javier.jorge@ucavila.es (J.J.-V.); sergio.nanez@ucavila.es (S.L.N.A.); wfierro@ueb.edu.ec (W.R.F.S.)

**Abstract:** The rise of digital technologies and their educational applications increasingly require the development of digital skills among university faculty. This study focuses on examining the level of digital competencies of university faculty and identifying their conditioning factors. To achieve this objective, an ex post facto methodological design with surveys is used. A sample of 216 university teachers from different regions of Ecuador was used. The non-parametric Chi-square test was used to validate the hypothesis of independence of the variables. The results obtained show that university faculty have a mostly intermediate level of digital skills, which is independent of gender, but dependent on the generational cohort. In particular, it is found that younger teachers (millennials) have a more advanced level of digital skills, although this relationship is not very strong. On the other hand, we observe the positive influence of the university's strategic leadership in terms of technological adoption on the development of teachers' digital skills. Universities with better technological resources and with training plans focused on the pedagogical application of technology have teachers with a more advanced level of digital skills. All of this leads to the recommendation that education policies should prioritise actions that promote the development of digital competencies among university faculty

**Keywords:** digital competences; higher education; technology adoption; digital literacy; teacher training; digital skills

**Citation:** Jorge-Vázquez, J.; Náñez Alonso, S.L.; Fierro Saltos, W.R.; Pacheco Mendoza, S. Assessment of Digital Competencies of University Faculty and Their Conditioning Factors: Case Study in a Technological Adoption Context. *Educ. Sci.* **2021**, *11*, 637. https://doi.org/10.3390/educsci11100637

Academic Editors: José Gómez Galán, Jose Ángel Martínez-López and Cristina Lázaro-Pérez

Received: 31 August 2021
Accepted: 7 October 2021
Published: 13 October 2021



## 1. Introduction

The incessant development of digital infrastructures, together with the universalisation of increasingly faster and more secure network access and interconnection, is favouring the configuration of a global digital ecosystem in which multiple disruptive processes are taking place [1]. This dizzying digitalisation is questioning the traditional forms and balances of economic and social organisation. The education sector is no stranger to this disruptive dynamic. On the contrary, in the last decade the use of digital technology in educational centres has grown exponentially. Recently, the health crisis brought about by COVID-19 has accelerated this process of digital transformation in university education. This new paradigm based on new digital technologies opens up a wide range of opportunities to be explored in the teaching–learning process in higher education [2].

Numerous studies have investigated this phenomenon in the educational context, especially since the approval of the Digital Agenda for Europe within the framework of the Europe 2020 Strategy [3], which prioritises digital literacy and the acquisition of digital skills for the entire population. Particularly noteworthy are the studies that analyse competences in the use of Information and Communication Technologies (ICT) among

university students, such as [4–11]. Numerous studies have also been published examining digital skills among university factuly and the factors that influence the pedagogical adoption of ICT [12–17]. Others, such as [18], have focused on exploring methods to address "the urgent problems of creating and functioning of virtual societies in universities".

Numerous studies have also addressed the importance of training in the development of teachers' digital competencies. Instefjord and Munthe [19] examine in their study the integration of digital competence in Norwegian teacher education curriculum documents and conclude that digital competence is not yet considered as an important component of teachers' professional competence.

Numerous studies have also addressed the importance of training in the development of teachers' digital competencies. Instefjord and Munthe [19] examine in their study the integration of digital competence in the curriculum documents for teacher education in Norway and conclude that digital competence is not yet considered as an important component of teachers' professional competence. Gudmundsdottir and Hatlevik [20] explore the training of newly qualified teachers to use information and communication technologies. In their study, they identify a deficiency of ICT training during teacher education. Fernández-Batanero et al. [21], after a systematic review of the literature on digital competencies and professional development, conclude that most studies reveal insufficient ICT teacher training. In short, most of the published works coincide in pointing out the importance of improving and increasing ICT teacher training as a priority of educational policies. This training must place digital competence as a basic pillar of the pedagogical competencies of university faculty [22].

Concerning the definition of the concept of digital competence in the literature, a large number of approaches can be found. For example, Flores-Lueg et al. [23] consider it to be a type of multidimensional competence that can be defined as the "ability to mobilise those skills and abilities that allow one to search for, critically select, obtain and process relevant information using ICT to transform it into knowledge, while at the same time being able to communicate this information through the use of different technological and digital supports, acting responsibly, respecting socially established norms and taking advantage of these tools to inform, learn, re-solve problems and communicate in different scenarios of interaction". Ilomäki et al. [24] argue that digital competence is an evolving concept that is conditioned by the "development of digital technology and the political aims and expectations of citizenship in a knowledge society". These authors define digital competence as the set of skills and knowledge necessary for citizens to participate in and contribute to a digitised knowledge society. Other authors, such as Starkey [25], after a review of the literature on digital competences in teaching, identify three different ways: generic digital competencies, digital teaching competencies and professional digital competencies three different ways. His study develops professional digital competence, which he defines as "the ability of the teacher to work in the context of a digitally infused schooling education system, including teaching, manage the digital learning environment and the professional work of being a teacher."

At the institutional level, the European Union (EU) has promoted the development of digital competences in various frameworks, including DigCompEdu [26], which aims to capture these educator-specific digital competences. For its part, the European Commission [27] considers digital competence as one of the nine key competences that enable citizens to participate actively in society and defines it as: "the confident, critical and responsible use of and engagement with, digital technologies for learning, at work and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking". Other institutions have also expressed their views on the subject. For UNESCO [28], "it is essential that teachers have the competencies to integrate ICT in their professional practice to ensure the equity and quality of learning". In this context, UNESCO has developed an ICT Competency

Framework for Teachers which covers a wide range of competencies necessary for teachers to integrate ICT in their professional practice. This e-skills framework will be adopted as a reference for this study.

However, despite efforts to promote the integration of ICT in teaching practice, some studies [29] warn that effective technological adoption by teachers is often not achieved. As Santos [30] points out, "this movement is not always technologically aligned with the available infrastructure, as teachers do not always opt for this effective adoption". Several studies point to a lack of teacher acceptance of integrating technology into teaching. For example, Howard [31] points out that such acceptance is influenced by three factors: "negative affective responses to technology, general risk-aversion in teaching and the perceived value of technology in teaching". Others, such as Somekh [32], point to technophobia or teacher scepticism as possible causes. For their part, Christensen and Knezek [33] identify three fundamental factors that condition the pedagogical adoption of ICT: i) the willingness (attitude) of teachers, their level of skill (digital competence) and access to technology. In this context, this research focuses on the study of two of these conditioning factors, in particular, the level of digital competence of university faculty and access to technology assessed through the technological endowment of the educational institution and the availability of specific training plans on digital competences.

Based on the review of the research background and the current status of the issue raised, the following research assumptions are made for subsequent contrast:

**Hypothesis 1 (H1):** *The age and gender of university faculty condition their level of digital competencies.*

**Hypothesis 2 (H2):** *Institutional leadership exercised through technological resources and the offer of specific training programs in the digital field is a conditioning factor in the degree of acquisition of digital competencies by university teachers.*

In short, this study aims to characterise the level of digital competences of university faculty and to analyse some of the conditioning factors. In particular, it aims to examine the influence of certain sociodemographic characteristics, such as gender or generational cohort, on the level of digital skills achieved by teachers. In addition, the study aims to identify whether the technological endowment of the educational institution and the type of digital skills training provided predict to some extent a higher or lower level of digital competence of university faculty.

Finally, this research adopts Ecuador as the territorial unit of analysis. Ecuador is still far from reaching average levels of digital connectivity in Latin America and the Caribbean (LAC) and is far from Organisation for Economic Cooperation and Development (OECD) levels. Furthermore, it ranks relatively low among South American countries in terms of the penetration of mobile and Internet services according to data published by the International Telecommunication Union (ITU) [34]. Despite this, the country's telecommunications sector has considerable potential for development in the coming years. The efforts of the government and operators to develop digital infrastructures are remarkable and so are the public policies adopted to reduce the digital divide [35]. A good example of this is the launch in 2019 of the "Ecuador Digital Strategy", whose main purpose is to improve the connectivity and digital literacy of the population and the country's productive sectors [36]. All these characteristics make Ecuador a territorial unit of analysis of great interest. As stated by Melo Fiallos et al. [37], "Ecuador is a country with a growing number of institutions with access to technology and connectivity". In this context, the creation of digital literacy programmes in education is key. It is not only the provision of digital infrastructure that is fundamental but also the training of teachers and the certification of their digital skills [36].

## 2. Materials and Methods

A cross-sectional, descriptive and correlational analytical observational study was carried out.

### *2.1. Sample*

The population considered in the study consisted of 20,466 teachers working in public universities and polytechnic schools in Ecuador [38]. Stratified random probability sampling was used to select the sample [39], with a confidence level of 95% and a sampling error of 6.64%, with $p$ and $q$ values of 0.5 and calculated as follows:

$$n = \frac{N \cdot Z_a^2 \cdot p \cdot q}{d^2 \cdot (N-1) + Z_a^2 \cdot p \cdot q} \quad (1)$$

where:

n = sample size;
N = population size;
Z = confidence level;
p = probability of success or expected proportion;
q = probability of failure (1-p);
d = precision (maximum admissible error in terms of proportion).

Thus, the study sample is representative and consists of n=216 university teachers. The characterisation of the sample is shown in the Table 1.

**Table 1.** Characterisation of the sample.

| Gender (Percentage) | Average Age (Years) | Level of Education: Highest Level of Education (Percentage) | Area of Knowledge (Percentage) | Area of Residence (Percentage) |
|---|---|---|---|---|
| Male: 62%<br>Female: 38% | 46.3 years | Ph.D: 20%<br>Higher education: 77%<br>Middle-higher: 3% | Agricultural Sciences: 6%<br>Medical Sciences and Health: 9%<br>Natural Sciences: 7%<br>Social Sciences: 39%<br>Humanities: 13%<br>Engineering and Technology: 25% | Urban: 94%<br>Rural: 6% |

### *2.2. Variable Selection*

The variables selected for this study were: age, gender, technological endowment of the university and type of digital skills training provided by the university (Table 2).

**Table 2.** Selected variables.

| Variable | Description |
|---|---|
| Gender | Male/Female |
| Age | Years/Generational cohorts |
| Type of training received in digital skills. Characterisation of the sample. | Training outside the university centre/Training provided by the university centre itself |
| Technological endowment of the university centre | Low technology endowment/Medium technol-ogy endowment/High technology endowment |

Additionally, the degree of acquisition of digital competences was included in the study. For this purpose, digital competences were selected by adopting the ICT competences framework for teachers proposed by UNESCO (2018) [28]. These competences are listed in Table 3.

**Table 3.** Digital literacy according to the framework proposed by UNESCO (2018). Source: Own development based on [28].

| Leves<br>Code \| Description | Competences<br>Code \| Description |
|---|---|
| N1. Knowledge Acquisition | C.1.1 Articulate how their classroom practices correspond to and support institutional and/or national policy.<br>C.1.2. Analyse curriculum standards and identify how ICT can be used pedagogically to support attainment of the standards.<br>C. 1.3. Make appropriate ICT choices to support specific teaching and learning methodologies.<br>C.1.4. Identify the function of hardware components and common productivity software applications and be able to use them.<br>C.1.5. Organize the physical environment to ensure technology supports different learning methodologies in an inclusive manner.<br>C.1.6. Use ICT to support their professional development. |
| N2. Knowledge Deepening | C.2.1. Design, modify and implement classroom practices that support institutional and/or national policies, international commitments (e.g., UN Conventions) and social priorities.<br>C.2.2. Integrate ICT across subject content, teaching and assessment processes and grade levels and create a conducive ICT-enhanced learning environment where students, supported by ICT, demonstrate mastery of curriculum standards.<br>C.2.3. Design ICT-supported project-based learning activities and use ICT to facilitate students to create, implement and monitor project plans and solve complex problems.<br>C.2.4. Blend varied digital tools and resources to create an integrated digital learning environment to support students' higher-order thinking and problem-solving skills.<br>C.2.5. Use digital tools flexibly to facilitate collaborative learning, manage students and other learning partners and administer the learning process.<br>C.2.6. Use technology to interact with professional networks to support their own professional development. |
| N3. Knowledge Creation | C.3.1. Critique institutional and national education policies alike, suggest revisions, design improvements and speculate on the impact of these changes.<br>C.3.2. Determine how best to incorporate student-centred and collaborative learning to ensure mastery of multidisciplinary curriculum standards.<br>C.3.3. While determining learning parameters, encourage student self-management in student-centred and collaborative learning.<br>C.3.4 Design knowledge communities and use digital tools to support pervasive learning.<br>C.3.5. Play a leadership role in devising a technology strategy for their school to turn it into a learning organization.<br>C.3.6. Continually develop, experiment, coach, innovate and share best practices to determine how the school can best be served by technology. |

Subsequently, the aggregate variable "level of digital competences" (CD) was obtained as the average of all the scores obtained in each of the 18 digital competences that were assessed. This variable takes three possible categories: beginner level, intermediate level and advanced level.

### *2.3. Data Collection and Processing*

An ex post facto survey design was used. The information is collected in a standardised way using a questionnaire that allows the intra-group analysis of the sample. This questionnaire includes, under an organised structure, the different indicators of the variables involved in the survey. The design of the questions in the questionnaire took into consideration their capacity to report reliable and quantifiable responses following the empirical variables for which precise information was to be obtained. The measurement instrument comprised three sections: firstly, the sociodemographic profile, environment and digitisation, digital profile and competences, educational digitisation and teaching practice. Data collection was carried out in the first half of the year 2021.

Finally, the statistical procedure was carried out using SPSS statistical software [40]. To assess the reliability of the instrument used in the study, Cronbach's $\propto$ was used [41]. Descriptive statistics using means, standard deviations and ranges were used for the quantitative variable "age", while frequencies and percentages were calculated for the

qualitative variables. To test the hypotheses of independence between categorical variables, we used Pearson's Chi-Square ($X^2$) statistical tests, the calculation of which allows us to observe, with 95% confidence intervals, whether the levels of the qualitative variables influence the levels of the categorical variable analysed, all this for a $p$-value < 0.05. The null hypothesis to be tested will therefore be the independence (H0=independence) between the factors, the alternative hypothesis (H1=association) being the dependence between them.

The following expression was used to calculate the Chi-Square:

$$X^2 = \frac{\sum_i^I \sum_j^J (F_{ij} - f_{ij}) \cdot 2}{F_{ij}} \quad (2)$$

where $F_{ij}$ is the observed frequencies and $f_{ij}$ is the expected frequency.

In conclusion, to assess statistical significance, the Pearson Chi-Square calculation is used and the p-value of the test is examined; if the p-value is below a specified significance level ($\alpha$) of 0.05, the difference can be said to be statistically significant and the null hypothesis of the test can be rejected.

## 3. Results

The analysis of the information collected through the questionnaire shows that the majority of university teachers have an intermediate level of digital competences. In particular, 32% of the individuals in the sample have an advanced level; 65% a medium level; and the remaining 3% a beginner or low level (Figure 1).

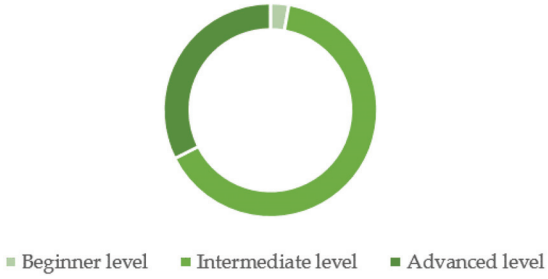



**Figure 1.** Distribution of the sample according to the level of digital skills achieved. Source: Own development.

These results are conditioned by the level of digitalisation of the country and the digital skills of the population. In this context, the general perception of university teachers is that the level of digitalisation in Ecuador is medium. Only 13.5% of teachers consider this level to be low, compared to 4% who consider it to be high.

On the other hand, the development of a comparative analysis exercise with the results on digital skills obtained in other neighbouring countries allows us to enrich this study and identify Ecuador's main weaknesses and strengths in this area. To this end, we use statistics published by various institutions such as the Economic Commission for Latin America and the Caribbean (ECLAC) [42], the International Telecommunication Union [43] and the World Bank [44].

The results show that Ecuador maintains a position close to the top in terms of the population's digital skills. From the comparative analysis carried out, Ecuador ranks third in terms of the percentage of the population with advanced digital skills and fourth in terms of intermediate skills. On the other hand, it is the country with the second lowest percentage of the population with basic digital skills. Despite this, it is still far behind Mexico, the country with the best results (Figure 2).

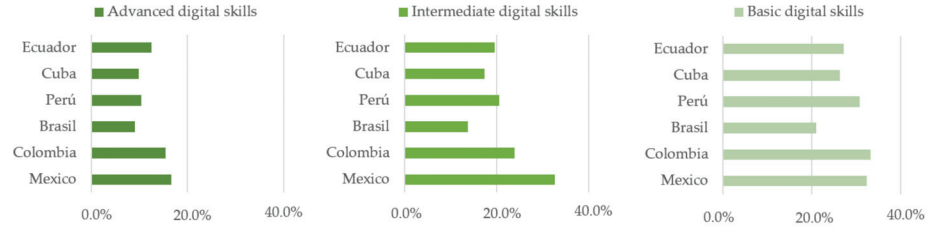



**Figure 2.** Digital skills of the population (2019). Source: Own elaboration based on [42–44].

The results obtained are presented below, ordered according to the different dependence/independence relationships between the variables examined. The data analysed are presented in Appendix A.

### *3.1. Relationship between Age and Level of Digital Skills*

In this study, the sample was grouped according to generational cohorts determined by age range. For this purpose, the classification proposed by [45] is adopted according to the Table 4.

**Table 4.** Classification of the sample according to generational cohort. Source: Own development based on [45].

| Generational Cohort | Age Range | % of Total Sample |
|---|---|---|
| Baby Boomers | 55–73 years | 25% |
| Generation X | 39–54 years | 48% |
| Millennials | 23–38 years | 27% |
| Generation Z | 7–22 years | 0% |

The analysis of the data collected in the survey shows no significant differences in the level of digital skills according to age. However, when classifying university faculty according to generational cohorts, we observe some small differences. The youngest teachers (millennial generation) do not have a beginner profile. Fifty-one per cent of them have an advanced profile compared to 49% who have an intermediate profile. On the other hand, among the Baby Boomers and Generation X, there is a group of teachers—albeit relatively small—with a beginner level. In the case of the Baby Boomer generation, this group accounts for almost 10% of the total (Figure 3).

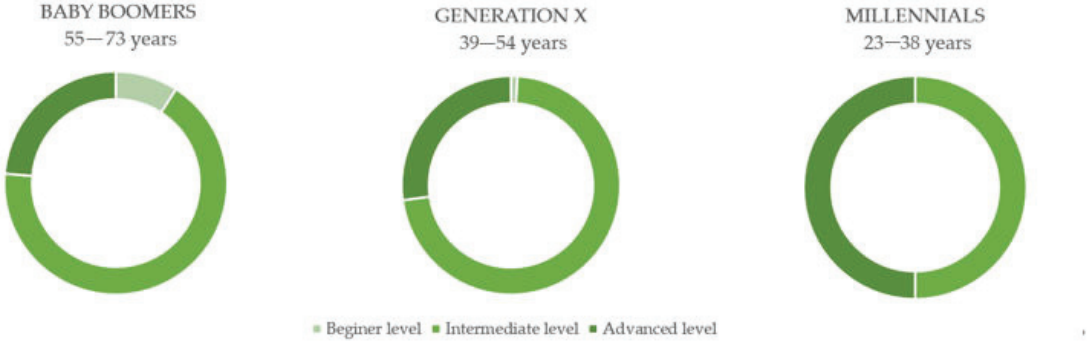



**Figure 3.** Profile of teachers' digital skills according to the generational cohort. Source: Own development.

The results of the Chi-Square test for the related variables of age and level of digital skills show statistical significance. Therefore, the null hypothesis (independence) is rejected and the alternative hypothesis (dependence) is accepted.

$$X^2\ (4) = 21.23,\ p < 0.05.$$

*3.2. Relationship between Gender and Level of Digital Skills*

According to the analysis of the data collected: no significant differences are observed concerning the average level of digital competences of university faculty according to gender. The average score obtained among men is 3.53 points out of 5, while among women the result is 3.52 points. There are also no differences between the average scores obtained in the different levels of technological adoption by teachers (acquisition, deepening and creation of knowledge) according to gender (Figure 4).

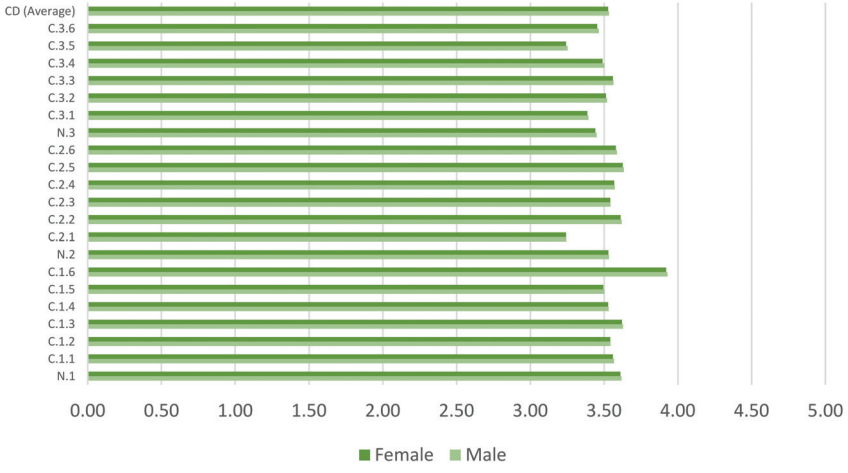



**Figure 4.** Digital competences of university faculty according to gender. Source: Own development.

On the other hand, among teachers with an advanced level of digital competences (score above 4 out of 5 points), a small difference can be observed. Of the total number of women, 27% have an advanced level of digital skills compared to 25% of men.

Finally, the result of the Chi-Square test reflects the existence of a statistically non-significant association between gender and teachers' level of digital skills, which forces us to accept the null hypothesis of independence.

*3.3. Relationship between the Educational Centre's Technological Resources and the Level of Digital Competences*

Based on the information gathered in the questionnaire, the universities can be classified according to three degrees of technological endowment: insufficient or scarce, medium and high. According to this classification, around half of the university faculty in the sample work in universities have a high level of technological provision. Thirty-five per cent of them work in educational centres with a medium technological endowment. The remaining 14% work in universities with an insufficient or scarce technological endowment (Figure 5).

On the other hand, 70% of the teachers in the sample with an advanced profile in digital competences work in universities with a high technological endowment, compared to 4.3% who work in universities with insufficient technological endowment (Figure 6).

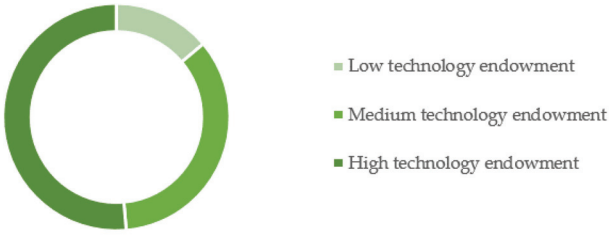



**Figure 5.** Distribution of the sample according to the technological equipment of the university educational centre. Source: Own development.

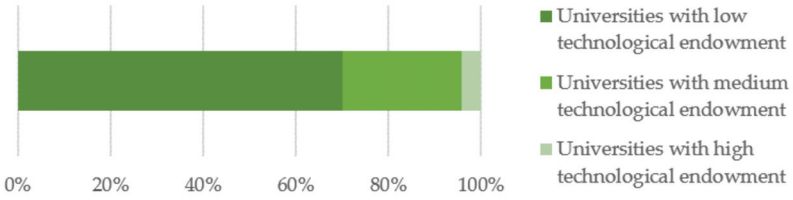



**Figure 6.** Distribution of university faculty with an advanced profile in digital competences according to the technological equipment of the university educational centre. Source: Own development.

Finally, Chi-square tests conclude that there is a statistically significant association between the level of the technological endowment of the higher education institution and the level of digital competences of university faculty.

$$X^2\ (4) = 28{,}99,\ p < 0.05.$$

*3.4. Relationship between Type of Training Received Versus Level of Digital Skills*

The results obtained in the questionnaire show that 68.5% of university faculty report that their university centres have training programmes for the use of digital technologies. In contrast, the remaining 31.5% say that they do not have access to such training programmes on a recurrent basis.

On the other hand, the data collected show the positive influence of the type of training on the level of digital skills achieved by university faculty. In particular, 80% of teachers with an advanced level of digital skills receive regular training in digital skills provided by their educational institution. In contrast, teachers with a lower level of digital skills do not have access to this type of training (Figure 7).

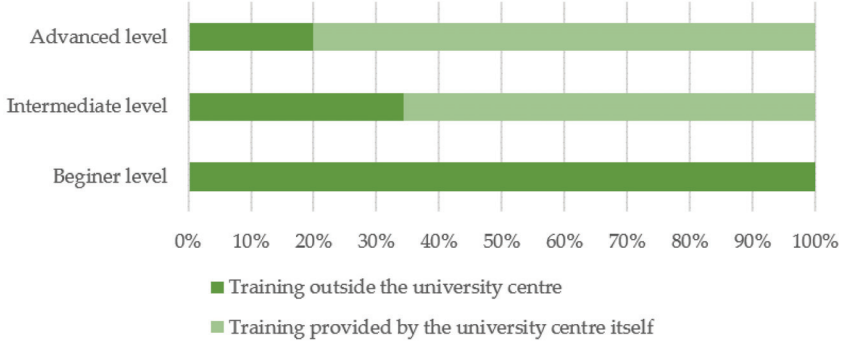



**Figure 7.** Distribution of university faculty by level of digital skills and main type of digital skills training received. Source: Own development.

Finally, a statistically significant association was found between the type of digital skills training received and the level of digital competence achieved.

$$X^2\ (2) = 17{,}85,\ p < 0.05.$$

## 4. Discussion

This study had two main objectives: on the one hand, to find out descriptively the level of digital competence of university faculty for each gender and generational cohort and, on the other hand, to examine whether there is a statistically significant association between this level and the involvement of the educational institution in promoting technological adoption. For this purpose, their technological endowment and the digital skills training programmes provided were examined.

Concerning the first purpose, the results obtained indicate that the average profile of university faculty in Ecuador is characterised by an intermediate level of digital competences, regardless of gender. These results are similar to the findings of previous studies such as Cabero-Almenara et al. [46] or Orozco et al. [47], whose results show an intermediate level of digital competence for both men and women. The study by Basantes-Andrade [48] also concludes that gender does not condition the level of digital skills of teachers. For their part, Guillén-Gámez and Mayorga-Fernández [49] point out that teachers have an average level of digital pedagogical competence, but they argue that this level "is still insufficient to meet current educational demands". Along these lines, Cahua Huerlo et al. [50] note that the number of educators with sufficient digital skills is currently relatively insufficient in Ecuador. A similar result is obtained by Blayone et al. [51] who point out the urgency of making the development of digital competencies an educational priority.

On the other hand, the results obtained show the influence of the generational cohort on the level of digital skills achieved. In particular, it is found that younger teachers belonging to the millennial generation have a more advanced profile in digital skills. In contrast, older teachers (Baby Boomers) have a lower level of digital skills. This result corroborates the existence of a certain generational digital divide among university teachers, in line with previous work [37]. On the other hand, although these results show that there is a negative relationship between generational cohort and the determination of digital competence, the results observed in other previous studies are not conclusive in this regard. For example, Basantes-Andrade et al. [48] point out the dependence between the digital skills of teachers and the generation to which they belong. These authors conclude that younger teachers (Generation Z) have the best results in digital skills. A similar result is observed in the work of Cabero and Barroso [52]. Other authors such as Gudmundsdottir and Hatlevik [20] conclude that younger teachers are more willing to incorporate technology into the teaching–learning process. On the other hand, other studies such as [53,54] have found that older teachers who can be included in generation X are more digitally competent.

Concerning the type of training received, a positive influence is observed between teachers' level of digital competence and access to specific and regular training in digital skills provided by their educational institution. These results are corroborated by other previous studies: Santos et al. [30] argue that teachers with a higher level of training have a higher level of digital competence. Fernández-Márquez et al. [55] identify a lack of training as a conditioning factor for the effective use of ICT in teaching. Another interesting finding is that younger teachers have access to more training in digital skills. In line with this result, Fernández [56] argue that younger teachers have a better ICT teacher training profile. A similar result is obtained in the work of Garzón-Artacho et al. [57]. On the other hand, the percentage of university teachers without access to digital training programmes in universities is high in Ecuador. These results are in line with those obtained in previous studies on Latin America and the Caribbean. In particular, Arias, E. et al. [58] conclude that 38% of teachers say that they do not have training programmes for the use of digital technologies at their university. They also verify that the availability of digital training

programmes is higher in private universities (66%) than in public universities (44%). In addition, this study identifies the lack of teacher training as one of the main obstacles to the implementation of digital technologies for learning.

All of this highlights the importance of training to boost the level of digital competences of university faculty. As Vázquez-Cano [59] points out, this training "must also go hand in hand with the didactic and socio-educational changes that are being generated at all times. Hence the importance of ongoing teacher training". In this context, the research carried out by Cabero-Almenara et al. [16] points to the need to promote specific training plans for university faculty in digital competences to achieve effective pedagogical technological adoption. The effectiveness of teacher trainers should also be promoted given their positive influence on the acquisition of digital skills [60].

Finally, the introduction of ICT in educational institutions has been particularly relevant in recent years, especially in the wake of the health crisis caused by COVID-19. The results obtained in our study show a relationship of dependence between the level of digital skills of university faculty and the degree of technological equipment of the universities where they work. Thus, it is found that universities with a better technological endowment employ teachers with a higher level of digital competences. In this context, although research on digital competence related to infrastructures and strategic leadership is still scarce [61], there are several studies [61–63] that point to the importance and influence of infrastructures in the integration of technology and the development of digital competences in educational contexts. Mumtaz [64], after reviewing the literature on teachers' technological adoption, points out that access to technological resources and training are factors that influence teachers' decisions to integrate ICT into their teaching. On the other hand, other authors have also identified a relationship between the pedagogical use of technologies and their provision in educational institutions. Thus, Lillejord et al. [65] found that the digital resources available were usually adapted to existing educational practices. In any case, investment in digital infrastructures has often not been accompanied by training programmes on the use and pedagogical exploitation of such technologies. Consequently, this effort in the technological equipment of educational centres has not been reflected in effective adoption by university faculty. This has limited the scope and transformative potential of digital technologies in the teaching–learning process.

## 5. Conclusions

This research showed the importance of digital literacy at universities. The study points to the consolidation of an emerging paradigm in higher education characterised by the configuration of increasingly complex learning environments conditioned by technological innovation. In this new paradigm, university faculty must have the ability to "develop innovative ways of using technology to enhance the learning environment and to encourage knowledge acquisition, knowledge deepening and knowledge creation" [28].

In this context, one of the main contributions of this article has been to assess the degree of development of digital competencies in the acquisition, deepening and creation of knowledge in a representative sample of university teachers according to the competency framework proposed by UNESCO [28]. The identification of conditioning factors for the development of digital teaching skills has also been another relevant contribution.

The results obtained in this study have revealed that university faculty mostly have an intermediate level of digital skills, which is more advanced in the generational cohorts that include younger teachers, regardless of their gender. The technological endowment of the university centre and the offer of specific training plans on the pedagogical application of digital technologies have been identified as conditioning factors in the development of digital skills by university faculty.

On the other hand, the analysis and discussion on the conceptualisation of digital competence and digital literacy in higher education have been based on the study of the existing literature on the state of the art. We have tried to apply the theoretical perspectives and ideas of the most representative empirical studies to guide our line of argumentation.

However, the lack of specific studies examining the digital competencies of university teachers according to the framework recently proposed and updated by UNESCO in 2018 has been a major limitation. The development of a comparative analysis with results obtained in other countries and regions would help to contrast the generalisability of the results obtained in this study. Therefore, a future line of research will be to extend the study to other latitudes.

Finally, the importance of digital competencies as a fundamental pillar of pedagogical competencies in the context of higher education has been highlighted. The need to improve the level of digital skills among university faculty is indisputable. All this leads us to recommend that educational policies include among their priorities an increase in investment in technological equipment and the promotion of specific teacher training plans on the application of digital technologies in teaching practice.

**Author Contributions:** Conceptualization, J.J.-V., S.L.N.A., W.R.F.S. and S.P.M.; methodology, J.J.-V. and S.L.N.A.; software, J.J.-V.; validation, J.J.-V. and S.L.N.A.; formal analysis, J.J.-V.; investigation, J.J.-V., S.L.N.A., W.R.F.S. and S.P.M.; resources, J.J.-V.; data curation, J.J.-V., W.R.F.S. and S.P.M.; writing—original draft preparation, J.J.-V.; writing—review and editing, J.J.-V.; visualization, S.L.N.A.; supervision, J.J.-V. and S.L.N.A.; project administration, J.J.-V. and W.R.F.S.; funding acquisition, S.L.N.A. All authors have read and agreed to the published version of the manuscript.

**Funding:** The APC was partially funded by the incentive granted to the authors by the Catholic University of Ávila.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Distribution of the sample according to the level of digital skills achieved [Dataset]. Source: Own development.

| Level of Digital Skill | Frequency |
|---|---|
| Beginner level | 6 |
| Intermediate level | 140 |
| Advanced level | 70 |
| Total | 216 |

**Table A2.** Profile of teachers' digital skills according to the generational cohort [Dataset]. Source: Own development.

| | Generational Cohort | | | |
|---|---|---|---|---|
| **Teacher's Digital Skill** | **Baby Boomers (Frequency)** | **Generation X (Frequency)** | **Millennials (Frequency)** | **Total** |
| Beginner level | 5 | 1 | 0 | 6 |
| Intermediate level | 37 | 74 | 29 | 140 |
| Advanced level | 13 | 28 | 29 | 70 |

**Table A3.** Distribution of the sample according to the technological equipment of the uni-versity educational centre [Dataset]. Source: Own development.

| Low Technology Endowment (Frequency) | Medium Technology Endowment (Frequency) | High Technology Endowment (Frequency) | Total |
|---|---|---|---|
| 30 | 75 | 111 | 216 |

**Table A4.** Distribution of university faculty with an advanced profile in digital competences according to the technological equipment of the university educational centre [Dataset]. Source: Own development.

| | Universities with Low Technological Endowment (Frequency) | Universities with Medium TechnoLogical Endowment (Frequency) | Universities with High Technological Endowment (Frequency) | Total |
|---|---|---|---|---|
| Advanced profile in digital competences | 49 | 18 | 3 | 70 |

**Table A5.** Distribution of university faculty by level of digital skills and main type of digital skills training received [Dataset]. Source: Own development.

| | | Training Outside the University Centre (Frequency) | Training Provided by the University Centre Itself (Frequency) | Total |
|---|---|---|---|---|
| Level of Digital Skill | Beginer level | 6 | 0 | 6 |
| | Intermediate level | 48 | 92 | 140 |
| | Advanced level | 14 | 56 | 70 |
| | Total | 68 | 148 | 216 |

## References


1. Jorge-Vázquez, J.; Chivite-cebolla, M.P.; Salinas-ramos, F. The Digitalization of the European Agri-Food Cooperative Sector. *Deter. Factors Embr. Inf. Commun. Technol.* **2021**, *11*, 514.
2. Jorge-Vázquez, J.; Náñez-Alonso, S.L.; Sanz-Bas, D.; Chivite-Cebolla, M.P. Nuevas tecnologías educativas al servicio del enfoque pedagógico Flipped Learning. In *Contribuciones De La Tecnología Digital En El Desarrollo Educativo Y Social*; REDINE, Ed.; Adaya Press: Eindhoven, NL, USA, 2020.
3. European Commission A Digital Agenda for Europe. *Communication* **2010**, *5*, 42.
4. Ordóñez-Olmedo, E.; Vázquez-Cano, E.; Arias-Sánchez, S.; López-Meneses, E. Las Competencias en el uso de las Tecnologías de la Información y la Comunicación en el alumnado universitario. *Pixel Bit. Rev. Medios Y Educ.* **2021**, *60*, 153–167. [CrossRef]
5. Vázquez-Cano, E.; León Urrutia, M.; Parra-González, E.; Meneses, E.L. Analysis of Interpersonal Competences in the Use of ICT in the Spanish University Context. *Sustainability* **2020**, *12*, 476. [CrossRef]
6. Mehrvarz, M.; Heidari, E.; Farrokhnia, M.; Noroozi, O. The mediating role of digital informal learning in the relationship between students' digital competence and their academic performance. *Comput. Educ.* **2021**, *167*, 104184. [CrossRef]
7. Guzmán-Simón, F.; García-Jiménez, E.; López-Cobo, I. Undergraduate students' perspectives on digital competence and academic literacy in a Spanish University. *Comput. Human Behav.* **2017**, *74*, 196–204. [CrossRef]
8. López-Gil, M.; Bernal Bravo, C. El perfil del profesorado en la Sociedad Red: Reflexiones sobre las competencias digitales de los y las estudiantes en Educación de la Universidad de Cádiz. *IJERI* **2019**, *11*, 83–100.
9. Burgos-Videla, C.G.; Castillo Rojas, W.A.; López Meneses, E.; Martínez, J. Digital Competence Analysis of University Students Using Latent Classes. *Educ. Sci.* **2021**, *11*, 385. [CrossRef]
10. Gómez-Galán, J.; Martínez-López, J.Á.; Lázaro-Pérez, C.; del Mar Fernández-Martínez, M. Usage of Internet by University Students of Hispanic Countries: Analysis Aimed at Digital Literacy Processes in Higher Education. *Eur. J. Contemp. Educ.* **2021**, *10*, 53–65. [CrossRef]
11. Concepción Rosa, J.D.; Veytia Bucheli, M.G.; Gómez Galán, J.; López Meneses, E. Integrating the Digital Paradigm in Higher Education: ICT Training and Skills of University Students in a European Context. *Int. J. Educ. Excell.* **2019**, *5*, 47–64. [CrossRef]
12. Zhao, Y.; Pinto Llorente, A.M.; Sánchez Gómez, M.C. Digital competence in higher education research: A systematic literature review. *Comput. Educ.* **2021**, *168*, 104212. [CrossRef]
13. Esteve-Mon, F.M.; Llopis-Nebot, M.A.; Adell-Segura, J. Digital Teaching Competence of University Teachers: A Systematic Review of the Literature. *Rev. Iberoam. Tecnol. Aprendiz.* **2020**, *15*, 399–406. [CrossRef]
14. Brevik, L.M.; Gudmundsdottir, G.B.; Lund, A.; Strømme, T.A. Transformative agency in teacher education: Fostering professional digital competence. *Teach. Teach. Educ.* **2019**, *86*, 102875. [CrossRef]
15. Garzón-Artacho, E.; Sola-Martínez, T.; Romero-Rodríguez, J.M.; Gómez-García, G. Teachers' perceptions of digital competence at the lifelong learning stage. *Heliyon* **2021**, *7*, e07513. [CrossRef]
16. Cabero-Almenara, J.; Gutiérrez-Castillo, J.J.; Palacios-Rodríguez, A.; Barroso-Osuna, J. Development of the teacher digital competence validation of DigCompEdu check-in questionnaire in the University context of Andalusia (Spain). *Sustainability* **2020**, *12*, 94. [CrossRef]

17. López Belmonte, J.; Pozo Sánchez, S.; Morales Cevallos, M.B.; López Meneses, E. Competencia digital de futuros docentes para efectuar un proceso de enseñanza y aprendizaje mediante realidad virtual. *Edutec. Rev. Electrón. Tecnol. Educ.* **2019**, *67*, 1–15. [CrossRef]
18. Syerov, Y.; Fedushko, S.; Loboda, Z. Determination of development scenarios of the educational web forum. In Proceedings of the 2016 XIth International Scientific and Technical Conference Computer Sciences and Information Technologies (CSIT), Lviv, Ukraine, 6–10 September 2017; pp. 73–76.
19. Instefjord, E.; Munthe, E. Preparing pre-service teachers to integrate technology: An analysis of the emphasis on digital competence in teacher education curricula. *Eur. J. Teach. Educ.* **2016**, *39*, 77–93. [CrossRef]
20. Gudmundsdottir, G.B.; Hatlevik, O.E. Newly qualified teachers' professional digital competence: Implications for teacher education. *Eur. J. Teach. Educ.* **2018**, *41*, 214–231. [CrossRef]
21. Fernández-Batanero, J.M.; Montenegro-Rueda, M.; Fernández-Cerero, J.; García-Martínez, I. Digital competences for teacher professional development. Systematic review. *Eur. J. Teach. Educ.* **2020**, *0*, 1–19. [CrossRef]
22. Pérez, K.V.P.; Torelló, O.M. The Digital Competence as a Cross-cutting Axis of Higher Education Teachers' Pedagogical Competences in the European Higher Education Area. *Procedia Soc. Behav. Sci.* **2012**, *46*, 1112–1116. [CrossRef]
23. Flores-Lueg, C.; Roig-Vila, R. Personal factors influencing future teachers' self-assessment about the pedagogical dimension of ICT use. *Rev. Iberoam. Educ. Super.* **2019**, *10*, 151–171. [CrossRef]
24. Ilomäki, L.; Paavola, S.; Lakkala, M.; Kantosalo, A. Digital competence–an emergent boundary concept for policy and educational research. *Educ. Inf. Technol.* **2016**, *21*, 655–679. [CrossRef]
25. Starkey, L. A review of research exploring teacher preparation for the digital age. *Cambr. J. Educ.* **2020**, *50*, 37–56. [CrossRef]
26. Redecker, C. *European Framework for the Digital Competence of Educators: DigCompEdu*; Publications Office of the European Union: Luxembourg, Luxembourg, 2017; ISBN 978-92-79-73494-6.
27. The Council of the European Union. Council recommendation of 22 May 2018 on key competences for lifelong learning (text with EEA relevance). *Off. J. Eur. Union* **2018**, 1–13.
28. Fallis, A. *Unesco Ict Competency Framework for Teachers [Marco de Competencias de Los Docentes Enmateria de TIC UNESCO]*; United Nations Educational, Scientific and Cultural Organization: París, France, 2018; Volume 53, ISBN 9788578110796.
29. Olofsson, A.D.; Lindberg, J.O.; Fransson, G. What do upper secondary school teachers want to know from research on the use of ICT and how does this inform a research design? *Educ. Inf. Technol.* **2017**, *22*, 2897–2914. [CrossRef]
30. Santos, C.; Pedro, N.; Mattar, J. Assessment of the proficiency level in digital competences of higher education professors in Portugal. *Rev. Educ.* **2021**, *46*. [CrossRef]
31. Howard, S.K. Risk-aversion: Understanding teachers' resistance to technology integration. *Technol. Pedagog. Educ.* **2013**, *22*, 357–372. [CrossRef]
32. Somekh, B. Factors Affecting Teachers' Pedagogical Adoption of ICT. In *International Handbook of Information Technology in Primary and Secondary Education.*; Voogt, J.K.G., Ed.; Springer: Boston, MA, USA, 2008.
33. Knezek, G.; Christensen, R. The Importance of Information Technology Attitudes and Competencies in Primary and Secondary Education. In *International Handbook of Information Technology in Primary and Secondary Education. Springer International Handbook of Information Technology in Primary and Secondary Education 2017 Volume 2*; Voogt, J.K.G., Ed.; Springer: Boston, MA, USA, 2008.
34. I.T.U. *Measuring the Information Society Report*; International Telecommunication Union (ITU): Geneva, Switzerland, 2017; Volume 1, ISBN 9789261245115.
35. International Telecommunication Union (ITU). *Measuring the Information Society Report 2017. Volume 2*; ICT country profiles; International Telecommunication Union: Geneva, Switzerland, 2017; Volume 2, ISBN 978-92-61-15291-8.
36. Zapata, C.R.; Rodríguez, E.I.; Zaballos, A.G. Estado actual de las telecomunicaciones y la banda ancha en Ecuador. *Banco Interam. Desarro* **2020**, *65*, 1–62.
37. Melo Fiallos, D.F.; Silva Chávez, J.A.; Indacochea Mendoza, L.R.; Núñez Campaña, J.H. Tecnologías En La Educación Superior: Políticas Públicas Y Apropiación Social En Su Implementación. *Rev. Digit. Investig. Docencia Univ.* **2017**, *11*, 193–206. [CrossRef]
38. Dirección Nacional de Gestión de la Información (DNG). *Estadística Docentes Universidades y Escuelas Politécnias en Ecuador*; Secretaría de Educación Superior, Ciencia, Tecnología e Innovación: Quito, Ecuador, 2021.
39. Hair, J.B.R.P.; Busch, R.P.; Ortinau, D.J. *Investigación de Mercados*; McGrawHill: México City, Mexico, 2010.
40. IBM Corp. *IBM SPSS Statistics for Windows*; Version 27.0.; IBM Corp.: Armonk, NY, USA, 2020.
41. George, D.; Mallery, P. *SPSS/PC + Step by: A Simple Guide and Reference.*; Wadsworth Publishing Company: Belmont, CA, USA, 1995.
42. Comisión Económica para América Latina y el Caribe (CEPAL). *Datos y Hechos Sobre la Transformación Digital*; Comisión Económica para América Latina y el Caribe (CEPAL): Santiago, Chile, 2021.
43. International Telecommunication Union. *Development Sector Measuring Digital Development. Facts and Figures 2020*; ITU Publ.: Geneva, Switzerland, 2020; pp. 1–15.
44. World Bank GCI 4.0: Digital Skills among Population -TCdata360. Available online: https://tcdata360.worldbank.org/indicators/h945a9708?country=BRA&indicator=41400&viz=line_chart&years=2017,2019 (accessed on 25 September 2021).
45. Center, P.R. Where Millennials end and Generation Z Begins. Available online: https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/ (accessed on 1 July 2021).

46. Cabero-Almenara, J.; Guillén-Gámez, F.D.; Ruiz-Palmero, J.; Palacios-Rodríguez, A. Digital competence of higher education professor according to DigCompEdu. Statistical research methods with ANOVA between fields of knowledge in different age ranges. *Educ. Inf. Technol.* **2021**, *26*, 4691–4708. [CrossRef] [PubMed]
47. Orozco Cazco, G.H.; González, M.C.; Abad, F.M.; Martín, A.M.V.; Cazco, G.H. Digital competence of the University faculty: Case study of the Universidad nacional de Chimborazo. *ACM Int. Conf. Proceeding Ser.* **2016**, 147–154. [CrossRef]
48. Basantes-Andrade, A.; Cabezas-González, M.; Casillas-Martín, S. Digital competences relationship between gender and generation of university professors. *Int. J. Adv. Sci. Eng. Inf. Technol.* **2020**, *10*, 205–211. [CrossRef]
49. Guillén-Gámez, F.D.; Mayorga-Fernández, M.J. Prediction of factors that affect the knowledge and use higher education professors from spain make of ict resources to teach, evaluate and research: A study with research methods in educational technology. *Educ. Sci.* **2020**, *10*, 276. [CrossRef]
50. Cagua Huerlo, G.A.; Moreta Velasco, K.M.; Arce Cuesta, M.F. Competencias digitales del profesorado: Pilares claves para una educación virtual de calidad frente a la pandemia en Ecuador. *Rev. Inclus.* **2021**, *8*, 224–241.
51. Blayone, T.J.B.; Mykhailenko, O.; vanOostveen, R.; Grebeshkov, O.; Hrebeshkova, O.; Vostryakov, O. Surveying digital competencies of university students and professors in Ukraine for fully online collaborative learning. *Technol. Pedagog. Educ.* **2018**, *27*, 279–296. [CrossRef]
52. Cabero, J.; Barroso, J. Formación del profesorado en TIC: Una visión del modelo TPACK. *Cult. Educ.* **2016**, *28*, 633–663. [CrossRef]
53. John, S.P. The integration of information technology in higher education: A study of faculty's attitude towards IT adoption in the teaching process. *Contad. Adm.* **2015**, *60*, 230–252. [CrossRef]
54. Siddiq, F.; Scherer, R.; Tondeur, J. Teachers' emphasis on developing students' digital information and communication skills (TEDDICS): A new construct in 21st century education. *Comput. Educ.* **2016**, *92–93*, 1–14. [CrossRef]
55. Fernández-Márquez, E.; Leiva-Olivencia, J.J.; López, E. Digital Competences in Higher Education Professors. *Rev. Digit. Investig. en Docencia Univ.* **2017**, *12*, 213–231. [CrossRef]
56. Fernández, F.J.; Díaz, J.F. Los docentes de la Generación Z y sus competencias digitales-Generation Z's Teachers and their Digital Skills. *Rev. Comun.* **2016**, *24*, 97–105.
57. Garzón-Artacho, E.G.; Martínez, T.S.; Ortega Martín, J.L.; Marín Marín, J.A.; García, G.G. Teacher training in lifelong learning-the importance of digital competence in the encouragement of teaching innovation. *Sustainability* **2020**, *12*, 2852. [CrossRef]
58. Arias Elena, E.J.; López Angela, P.L. *Covid 19, Tecnologías Digitales y Educación. ¿Qué Opinan los Docentes ?* Banco Interamericano de Desarrollo y Tecnológico de Monterrey: Monterrey, Mexico, 2020.
59. Vázquez-Cano, E. El reto de la formación docente para el desarrollo de una metodología ubicua en la Educación Superior. *Perspect. Educ.* **2015**, *54*. [CrossRef]
60. Instefjord, E.J.; Munthe, E. Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teach. Teach. Educ.* **2017**, *67*, 37–45. [CrossRef]
61. Pettersson, F. On the issues of digital competence in educational contexts–a review of literature. *Educ. Inf. Technol.* **2018**, *23*, 1005–1021. [CrossRef]
62. Vanderlinde, R.; van Braak, J. The e-capacity of primary schools: Development of a conceptual model and scale construction from a school improvement perspective. *Comput. Educ.* **2010**, *55*, 541–553. [CrossRef]
63. Wastiau, P.; Blamire, R.; Kearney, C.; Quittre, V.; Van de Gaer, E.; Monseur, C. The Use of ICT in Education: A survey of schools in Europe. *Eur. J. Educ.* **2013**, *48*, 11–27. [CrossRef]
64. Mumtaz, S. Factors affecting teachers' use of information and communications technology: A review of the literature. *J. Inf. Technol. Teach. Educ.* **2000**, *9*, 319–342. [CrossRef]
65. Lillejord, S.; Børte, K.; Nesje, K.; Ruud, E. *Learning and Teaching with Technology–A Systematic Review*; Knowledge Centre for Education: Oslo, Norway, 2018; ISBN 9788212037038.

education sciences

MDPI

*Review*

# Tourism and ICT. Bibliometric Study on Digital Literacy in Higher Education

**David Caldevilla-Domínguez [1], Alba-María Martínez-Sala [2,*] and Almudena Barrientos-Báez [3]**

[1] Faculty of Information Sciences, Complutense University of Madrid, 28040 Madrid, Spain; davidcaldevilla@ccinf.ucm.es
[2] Department of Communication and Social Psychology, University of Alicante, 03690 Alicante, Spain
[3] University of La Rioja, 26006 La Rioja, Spain; almudena.barrientosbaez@unir.net
* Correspondence: albamaria.martinez@ua.es

**Abstract:** The scientific production of digital literacy at the university level published in the Scopus database is analyzed, with a special emphasis on studies on tourism due to the relevance of information and communication technology (ICT) in said professional sector. For this, a bibliometric study of a pertinent sample is undertaken using a mixed methodology and based on a series of variables related to formal and content aspects. The last variable, reserved for the academic field under study, directly addresses the main objective as regards tourism. The results show a great global and multidisciplinary interest in digital literacy (DL), mainly from students. There is also a parallel between the integration of ICT into society and the growing evolution of case studies, as well as little interest in their development in specific areas such as tourism studies. Despite good results in general terms, the lack of specialization poses challenges that require greater involvement of training institutions in the sense of providing future professionals with the necessary tools to face them successfully, especially in sectors such as tourism where ICTs are a key piece.

**Keywords:** bibliometric; digital literacy; digital education; educational technology; higher education; ICT; tourism

**Citation:** Caldevilla-Domínguez, D.; Martínez-Sala, A.-M.; Barrientos-Báez, A. Tourism and ICT. Bibliometric Study on Digital Literacy in Higher Education. *Educ. Sci.* **2021**, *11*, 172. https://doi.org/10.3390/educsci11040172

Academic Editor: Eleanor Dommett

Received: 9 March 2021
Accepted: 1 April 2021
Published: 6 April 2021



## 1. Introduction

Technological development, and especially the 2.0 web model, is causing drastic changes in society in general [1–3]. Information and communication technologies (ICT) have been implemented in the day-to-day life of people, companies, etc., modifying all the processes related to interaction and socialization [4,5], but also other more specific processes, such as those concerning education [6–8]. The educational system needs to adapt to new scenarios resulting from the development and massive implementation of ICT both at a methodological level, adapting the teaching-learning processes, as well as the educational objectives in relation to the training of students [9,10]. Hence, there is not only a need to integrate ICTs into training processes, but also to equip students with the knowledge and skills necessary to optimize their use [11–13]. Today there are tools that allow learning processes to be much more personalized and more flexible [14]. In this specific case, ICT training as a cross-cutting element is the key to the correct future professional performance of graduates.

In this sense, at all educational levels and, especially at the university level [15–17], the concept of digital literacy (DL) arises and refers to the safe and critical use of ICT that favors the achievement of objectives. This is not only related to learning, but also to the employability of students and their active participation in society [18–21]. Along the same lines, UNESCO proposes the following definition of DL:

> "Digital literacy is the ability to define, access, manage, integrate, communicate, evaluate and create information safely and appropriately through digital technologies and networked devices for participation in economic and social life. It

> includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy, data literacy, and media literacy." [22] (p. 132)

In this sense, in the university academic field, DL implies equipping students with the skills, knowledge, and attitude necessary to interact with digital tools and content in an effective, efficient, and ethical manner, while exploiting all their skills: informative, communicative, relational potential, etc. [23,24]. In the current globalized and virtually interconnected business context, the DL of students, as future protagonists of this market, must be incorporated into the university environment as one of the main formative objectives [17]. Its consideration is not only an important curricular innovation [25,26] but it is also an added value for both students and teachers, particularly when it is adapted to different fields of study [17,27–29]. Despite the demands and advantages described, many higher education institutions have not yet fully embraced DL as a fundamental literacy [30].

From the above, it is understood that notable interest exists in academic research on the literacy of university students [1,19,31] characterized by a constant adaptation to the new demands derived from the changes experienced by the social environment, which are caused, to a large extent, by technological development [10,16,19,32]. Another feature that defines research on literacy, and specifically on DL, is its focus or specialization in specific areas or disciplines in response to the different levels of demand that professional sectors require of graduates [9,33–35], including the tourist field [36–41].

Higher education plays a key role in acquiring the skills necessary for students to be properly integrated into the professional context [41,42]. In this sense, DL must provide students, in general, with the necessary qualification to face the challenges of the digital information age [15,43,44]. This maxim acquires greater relevance among tourism students [38,40] due to the growing impact that ICTs have had on the sector [45–48] and because the forecast, based on the pandemic we are experiencing, is that it will keep growing [49–53].

In the era of digital information, the tourism sector has been one of the sectors that have given the greatest impulse for the introduction of ICT [54], undergoing a profound transformation, as a result of its integration [55,56], with important repercussions for destination management and marketing [57–59]. The technological revolution has affected all agents in the sector, from professionals to consumers, and ICTs have become a key element in the competitiveness of tourism companies [60,61]. The challenge for this sector does not lie in accepting the advantages of ICT and integrating them, those that do not do so are doomed to failure, but in doing so in such a way that it is exploited its full potential [62]. For this reason, one of the most important challenges facing this industry is related to ICT training for new generations of tourism professionals [63].

Official studies related to this industry are relatively recent because for a long time it was not considered that the incorporation of this labor into this sector required specific training [64]. This has resulted in an industry in which its workers have been the least qualified academically compared to others [65]. However, in the evolution of tourism towards a crucial sector for the development of many countries [66–68], the specialization and training of its professionals have become a key factor that guarantees the competitiveness of destinations [63,69]. This is how, in the face of the professionalization and modernization of a sector in which the demand for qualified personnel is constantly growing, educational institutions have been developing study programs to satisfy this need [39,69,70]. In these programs, skills and abilities related to ICT [71–74] are essential given the impact of these tools in the associated professional field [39,63,75]. In this regard, the agents that make up the tourism sector question whether the training of graduates of the tourism branch is appropriately adapted to the needs of an increasingly complex and competitive work environment [76] that requires a multitude of skills and competencies [39,63,69,77–79] among which those related to ICTs [63] stand out.

In this sense, research related to education, study programs, etc., of the tourism area is gaining prominence in the academic and professional fields [69,76,80,81] while those

focused on challenges posed by the integration of ICT in this same industry [60]. Thus, the benefit of delving into those that combine both aspects and focus on the consideration of ICT as a fundamental part of the academic training of tourism students [40,69] and, consequently, on their DL is evident.

Research on education in specific fields and on some of its key aspects, such as DL, is frequent due to the interest in the academic and teaching fields [44,82–84]. Furthermore, technology is a recurring topic due to its implications in the evolution of teaching and the changes that this requires [1,44,85,86]. The circumscription to specific disciplines or branches of studies is due to the fact that the aforementioned implications vary among them [87,88]. In this sense, and as already indicated, in the field of tourism studies, DL is crucial given the incidence of ICT in this industry [67,89–92].

Based on the above, the main objective of this research consists of analyzing the scientific production on DL in higher education to describe it and, also, determine the degree of prominence of studies on tourism in this field. From the main objective, there are a series of specific objectives that are classified into two sections. The first section brings together those related to the descriptive aspects of the basic characteristics of the documents and that do not require consulting their contents, as is the case of the objectives of the second section.

O1 Formal descriptive objectives:

- O1.1: Determine the evolution of research on DL.
- O1.2: Classify research on DL according to the type of document.
- O1.3: Classify research on DL according to the productivity of the journals.
- O1.4: Classify research on DL according to the productivity of the authors.

O2 Descriptive objectives of the content:

- O2.1: Classification of documents according to their nature.
- O2.2: Classification of documents according to geographic scope.
- O2.3: Classification of documents according to the university population segment of the study.

The set of objectives related to the description and analysis of the literature on DL in higher education is completed with a series of objectives related to the study of DL in the area of tourism.

- O2.4: Classification of documents according to academic/teaching area (in which areas or discipline/s the study is carried out).
- O2.5: Determine the level of presence of research on DL in the field of studies related to the sector and industry of tourism.

To achieve the stated objectives, a systematic literature review is carried out. This is a theoretical construct whose purpose is to review the relevant documents in the field obtained from the most relevant databases [19,93].

## 2. Materials and Methods

The present investigation has been designed following the traditional structure of bibliometric studies in the field of education [19,44,94,95]. Therefore, scientific production carried out in a specific area and on a specific topic is analyzed [8,96]. Specifically, quantitative and qualitative analysis are combined for the study of DL in higher education, in the field of Social Sciences, Business, Management and Accounting and Economics, and Econometrics and Finance, hereinafter (DLSC), for being the disciplines in which the studies that make up the main object of this research are framed, those related to the tourism sector and industry.

The work was carried out between November 2020 and January 2021, in the Scopus database, one of the most prestigious and credible and essential in the field of bibliometric studies [8,19,97,98]. The initial sample ($n_1 = 246$) is the result of applying the filters derived from the main objective of this research and which correspond to the words: "Higher education" and "Digital Literacy", both included in the UNESCO thesaurus. The searches

were carried out in the areas of Social Sciences, Business, Management and Accounting and Economics, Econometrics, and Finance based on the main object of study, tourism education, and in the same way as previous research in the educational field [83,84]. Table 1 provides details of the search criteria.

**Table 1.** Search criteria.

| | **Scopus** |
|---|---|
| Search field | Article title, Abstract, Keywords |
| Search Words | Higher Education; Digital Literacy |
| Boolean operator | W/0, AND |
| Period | Without delimiting. |
| Subject Area | Social Sciences, Business, Management, and Accounting and Economics, Econometrics and Finance |
| Databases | Scopus |

After the initial search, based on the criteria set out in Table 1, the results obtained were reviewed to discard those that did not adhere to the delimited field of study: digital literacy in higher education, obtaining a final sample ($n_2$ = 220) which includes all types of publications: articles, books, book chapters, conference publications, etc. The 26 discarded publications were excluded because they do not focus on the analysis or study of digital literacy and/or the field of higher education. Then, following the method used by other authors [19] to guarantee coding reliability, the review and selection of the documents were carried out by the three authors individually, who assessed their suitability on a scale of 1–3. Once evaluated, all those that had obtained a total score equal to or greater than 6 were selected. There were no cases of disagreement, but, if it had occurred, it was planned to be resolved with a fourth reviewer.

Once the final sample was formed, it was studied from the Excel lists provided by the Scopus database and from the documents themselves that were downloaded when the abstract (information that is provided in the database lists) was not sufficient for its classification. The quantitative and qualitative analysis was carried out from a series of macros created in Excel based on the analysis variables resulting from the research objectives set. These are based on previous studies and research as detailed in Table 2, where they are related, at the same time, to the objectives.

**Table 2.** Study variables.

| **Objective** | **Analysis Variable** | **Description** | **Adapted from** |
|---|---|---|---|
| | | O1 Formal descriptive objectives | |
| O1.1 | Diachronic productivity | Grouping of documents analyzed for years. | [1,44,83–86,98] |
| O1.2 | Productivity by type of document | Grouping of documents according to the typology established by Scopus: article, book, book chapter, conference paper, conference review, and review. | [44,83,84,97] |
| O1.3 | Magazine productivity | Grouping of documents according to the journals in which they have been published. Those who have published 2 or more articles about DLSC are shown. | [1,8,44,83] |
| O1.4 | Author productivity | Documents are grouped by authors. The most productive are displayed. | [1,44,83,84,86,98,99] |
| | | O2 Descriptive objectives of the content | |
| O2.1 | Productivity by character | The documents are grouped according to the nature of the research, distinguishing between experimental and theoretical. | [19,31,85,99] |
| O2.2 | Productivity according to geographical area | The documents are grouped according to the geographical scope of the investigation. | [16,19,99] |

**Table 2.** *Cont.*

| Objective | Analysis Variable | Description | Adapted from |
|---|---|---|---|
| O2.3 | Productivity according to the population segment under investigation. | The documents are grouped according to the population segment in which the degree of DL is evaluated: teachers, students, etc.; and no, through whom it is evaluated. | [16,19,99] |
| O2.4 | Productivity according to academic/teaching area, or according to discipline | The documents are grouped according to the area/s or discipline/s in which the research or study is carried out. | [8,16,97] |

## 3. Results

In this section, we present two types of results based on the two categories of objectives set (O1 and O2). First, the general statistics of sample $n_2$ are discussed to provide an overview of the research on DLSC in higher education. Second, it delves into the nature of the studies and the sample analyzed to reveal the type of research being carried out and the fields of analysis (areas or disciplines) of greatest interest, paying special attention to those related to tourism.

### *3.1. Research on DLSC in Higher Education: Formal Description*

First, the diachronic evolution of DLSC research (O1.1) is described. The search has not been temporarily limited, however, the only publication located in 2021 is not included because it is not representative of the productivity of that year since the study covers a single month of that year: January 2021.

Figure 1 shows a general growing trend in research production around the DLSC that stands out particularly in the 2013–2020 period, reaching its maximum in the last three years (2018–2020). Scientific production on DLSC does not emerge until 1997, and no other documents appear until 2006, nine years later. The following years have only one publication per year until 2009, which presents 4. Between 2009 and 2012, production experienced growth and a decrease in the same proportion (+100%). This pattern is repeated in the 2013–2016 period with a lower percentage (approximately 30%). In 2017, production stood at 19, and since then it has not stopped growing, although the most important jump occurs between 2019 and 2020, with a growth of 57%. The year 2020 had the greatest scientific production on DLSC.

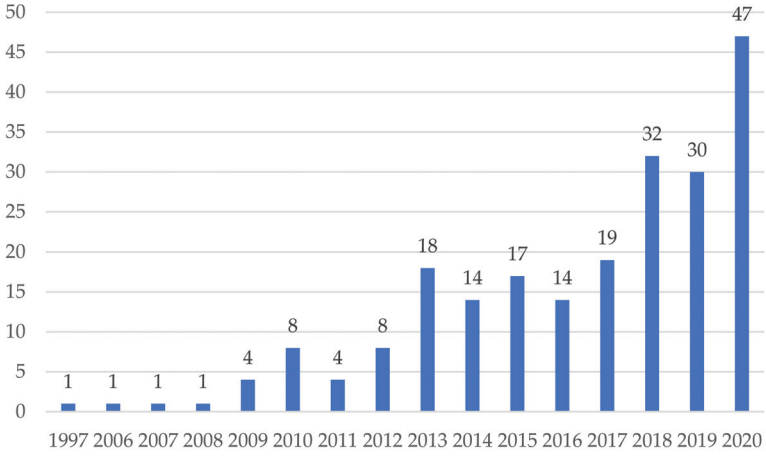



**Figure 1.** Diachronic productivity.

Below, the productivity according to the type of document established by Scopus is described in Figure 2 (O1.2).

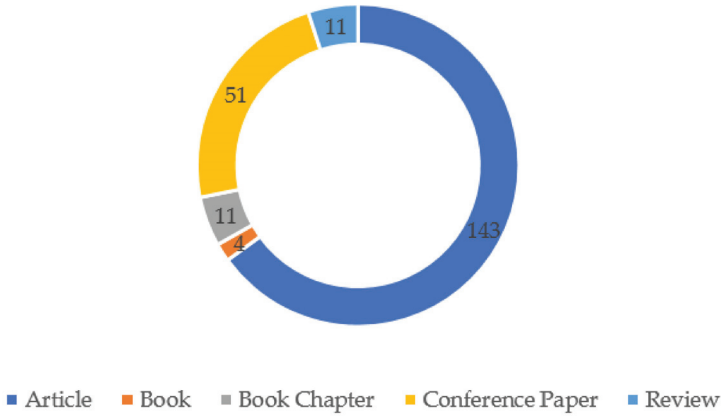



**Figure 2.** Productivity by type of document.

Of the six types contemplated in Scopus, articles are the most numerous, followed by conference papers. Both account for about 90% of the total. Regarding the other categories, the sample includes the same number of reviews as the book chapter (11), and there are only 4 books. No conference reviews have been found. The predominance of articles justifies the following evaluation criterion relative to productivity by journals (O1.3). Figure 3 shows all those that have 2 or more articles published on DLSC.

As can be seen in Figure 3, there are two journals that stand out for the number of articles published on DLSC. These journals are *Research in Learning Technology* and *International Journal of Early Childhood Special Education*, both with a total of 8 articles. After these, we found a case with 5 published articles (*Journal of Information Literacy*) and another with 4 (*Teaching in Higher Education*). The rest are divided into two groups, one of 6 journals with 3 publications, and the majority, which comprises 18 journals, have published 2 articles on the subject. The rest of the magazines, not reflected in the graph, adding up to a total of 141, have published a single article. Table 3 delves into the most relevant journals.

**Table 3.** Description of journals with more than three articles published on DLSC.

| Journal | N° Articles about DLSC | % Total Articles about DLSC (220) | Country | Impact Index SJR (2019) | Cuartil Education-SJR 2019 |
|---|---|---|---|---|---|
| Research in Learning Technology | 8 | 3.6% | United Kingdom | 0.406 | Q2 |
| International Journal of Early Childhood Special | 8 | 3.6% | Turkey | 0.112 | Q4 |
| Journal of Information Literacy | 5 | 2.3% | United Kingdom | 0.884 | Q1 |
| Teaching in Higher Education | 4 | 1.8% | United Kingdom | 1.284 | Q1 |

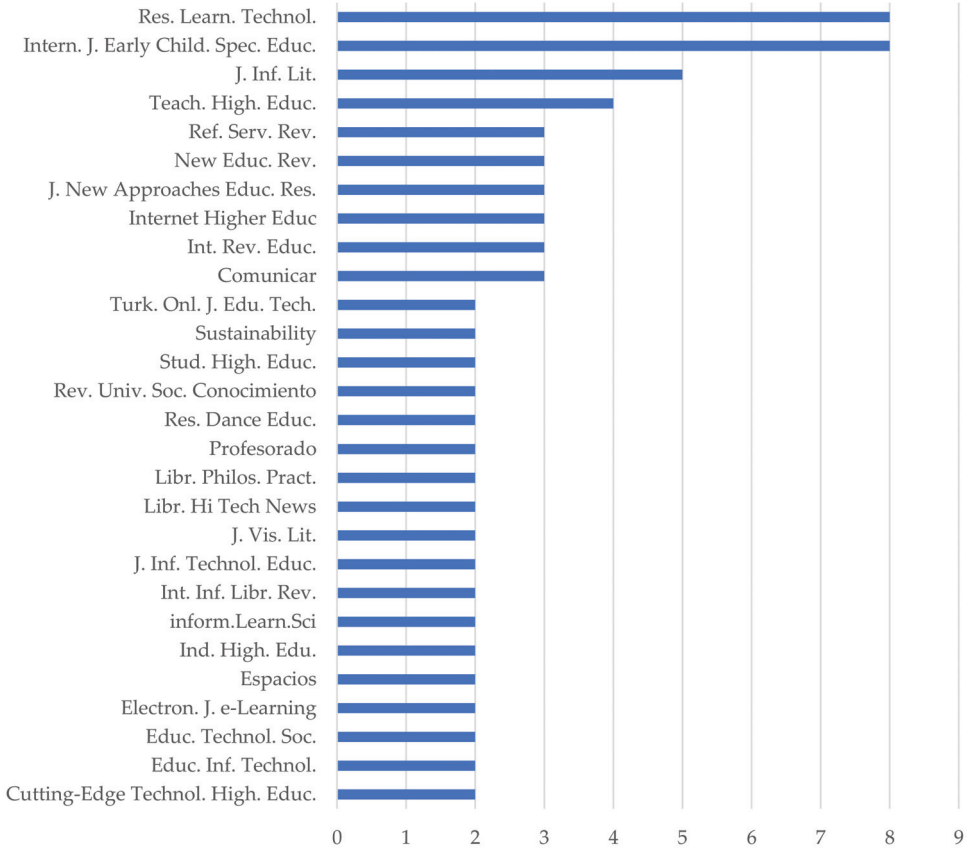



**Figure 3.** Productivity per journal.

Among the journals with the highest number of articles, those from the United Kingdom and those in the Q1 of education predominate, although the two that occupy this category are the ones that have published the least number of articles (5 and 4) within this group.

Regarding the productivity of the authors, no really remarkable cases have been observed. The 220 documents are signed by a total of 325 authors who are distributed between individual signatures and co-authorship of up to 18 authors, although the most frequent are between 2 and 4 authors. Of the total number of authors, 251 appear in a single document, 34 in two, and only 2 appear in three documents. Precisely these last two, due to their prominence, are the ones described in Table 4.

**Table 4.** Description of authors with three documents published on DLSC.

| Autor | N° Documents about DLSC | % about Total Documents DLSC (220) | Citations/Documens by Autor (SJR) | H—Index (SJR) | University |
|---|---|---|---|---|---|
| Browning, Francesca | 3 | 0.13% | 3/1 | 1 | Bishop Grosseteste University, Lincoln, United Kingdom |
| McLoughlin, Catherine E. | 3 | 0.13% | 1.617/80 | 14 | Australian Catholic University, North Sydney, NSW, Australia |

The results shown in Table 4 show two totally opposite cases, apart from the fact that both are women. Browning, F. is an author with little production cataloged in Scopus and, consequently, with an h-Index and number of citations received much lower than the other author, McLoughlin, CE, who has a total of 80 documents in Scopus, 1617 citations, and an h-index of 14.

### *3.2. Research on DLSC in Higher Education: Content Description*

Once the documents were formally described, content analysis was carried for a more in-depth analysis. In this regard, in the first place, O2.1 regarding the nature of the research or study carried out is proposed, and the results are shown in Figure 4.

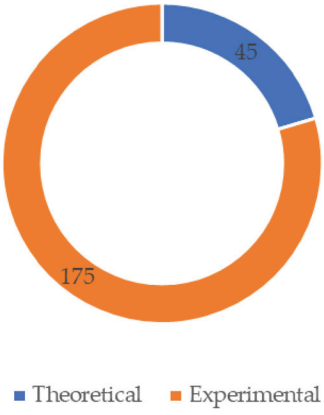



**Figure 4.** Productivity according to the nature of the research.

The results show a clear predominance of experimental research (empirical research, case studies, etc.). This type represents approximately 80% of the production, compared to theoretical research (review articles, meta-analysis, etc.). Likewise, it should be noted that the analysis of the abstracts and, when necessary, of the complete documents, has led to considering a greater number of documents as reviews compared to those cataloged by the database. This is considered in the section regarding the nature of the investigation, but not in the one concerning the type of document (Figure 2) where the data reflected have been strictly provided by Scopus.

Once the documents were classified according to the nature of the investigation, they were delimited geographically (O2.2). This variable also guides the scope of the studies. Based on the results obtained, four categories have been established: A, for studies that cover one or more continents and more than one country; B, for those that focus on independent countries, principalities, republics, etc.; C, for those developed in states, regions, autonomous communities, etc.; and, finally, D, for the provinces, cities, municipalities, etc.

Figure 5 shows a clear predominance of studies that cover a country (81) followed by those that are carried out in specific localities (64). In the field of reviews, however, those of category A predominate. In relation to the geographic field, the countries, principalities, republics, etc., of an independent nature (category B) where it has been investigated further in DLSC, a total of 56 independent countries, principalities, etc. were counted. Of these, 28 have been the object of study only once, the rest are shown in Figure 6.

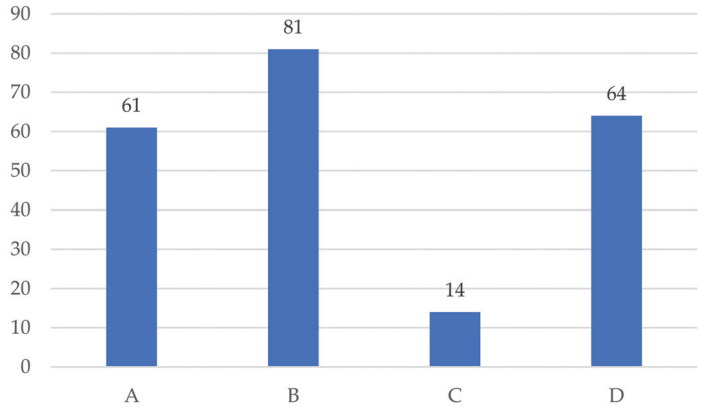



**Figure 5.** Productivity according to geographical area.

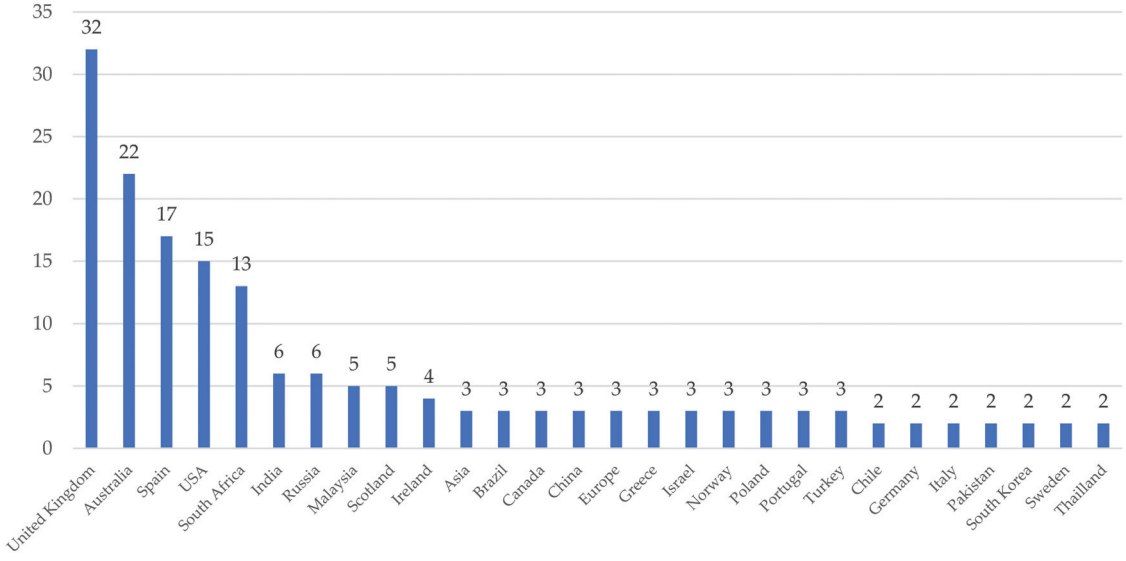



**Figure 6.** Productivity according to the geographic scope of the research (category B).

The United Kingdom is the country that has been investigated the most concerning DLSC as shown in Figure 6. Followed by Australia and Spain, present in 22 and 17 investigations, respectively. The USA and South Africa also exceed 10 studies, but the bulk is below this figure. Among these, the countries that have been the object of research in 2 and 3 studies stand out. This category includes a total of 18 countries, compared to the 10 that have a presence in more than 4 investigations. Finally, it should be noted that, for the most part, the investigations are focused on a single geographic area, and only 11 are carried out in more than one country.

The next characteristic of the studies that are addressed concerns the population analyzed with its DL (O2.3). This implies differentiating the population between which the research is carried out from that which is the object of study, since, for example, the DL of students can be analyzed by surveying their teachers. The present investigation focuses on the population being studied, and the results reveal that the interest is concentrated on the students (Figure 7).

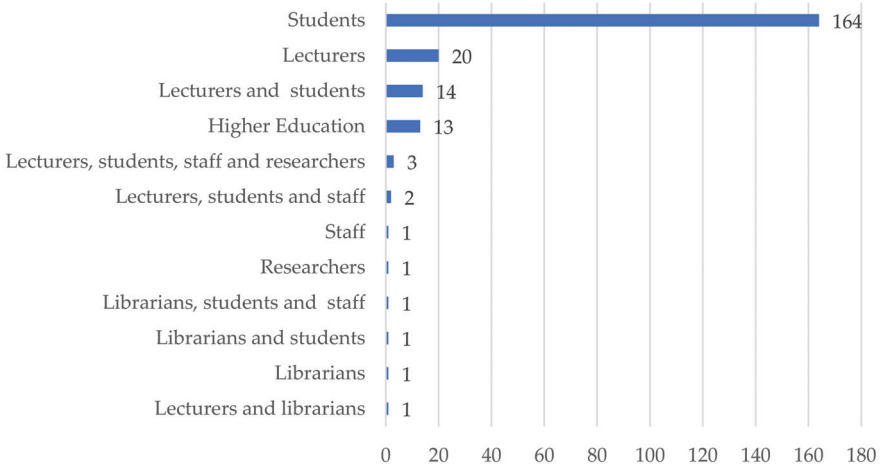



**Figure 7.** Productivity according to the population segment under investigation.

DL studies account for 84% of total production (220). As shown in Figure 7, compared to the 164 investigations that focus exclusively on this population segment, there are 7 more that also study other groups (lecturers, staff, librarians, and researchers). The lecturers are the next interest group (approximately 19%). In this case, as in the case of students, investigations that focus exclusively on them (20) predominate, although they also appear in others in which they are studied together with other groups. The 'Higher Education' category refers to those studies in which no population group is investigated. These are fundamentally reviews about the conceptualization of DL, the evolution of its study, etc.

Finally, the documents are classified according to the academic area or disciplinary area in which they are developed (O2.4). These results, in addition to serving as the description and study of the sample, can address O2.5 concerning the prominence of studies on tourism in research on DL (Figure 8).

As shown in Figure 8, 17 categories have been established after unifying, at the discipline level, the information provided in the revised documents that varies from one or several specific subjects to one or more disciplines, passing through one or more degrees, postgraduate studies, etc. Many studies do not focus on any specific area but are carried out within the scope of one or more universities. These are reflected in the category 'universities, university' and represent the majority of research on DLSC. Likewise, the 'Higher Education' category is recovered since, as was the case with the population segment variable (Figure 7), they are not associated with any specific discipline.

In relation to the rest of the categories, the 'Education' area stands out as the most researched regarding DL. These represent 37% of the total production, considering exclusively the documents that are located in a specific academic area. The following disciplines can be grouped into three subcategories. In the first place, we consider those that concern 10 or more documents, where we find areas as disparate as Business and Management, Engineering and Languages, and Philology. It is surprising to see the appearance of the Engineering discipline among the results of a limited search in the areas of Social Sciences, Business, Management and Accounting and Economics, Econometrics, and Finance, but examining the documents reveals that parts of these studies focus on subjects related to the described subject areas, and others appear because Engineering is investigated together with other disciplines of these subject areas. The described group (10–30 documents) adds a total of 38 documents while the last group, which brings together those disciplines that have been considered in less than 10 documents, includes a total of 52 publications. In the last group, a great dispersion is observed and tourism studies are contemplated in only

2 documents. It is, in both cases, multidisciplinary research that covers areas as diverse as Education, Business, Medicine, and Information Technology.

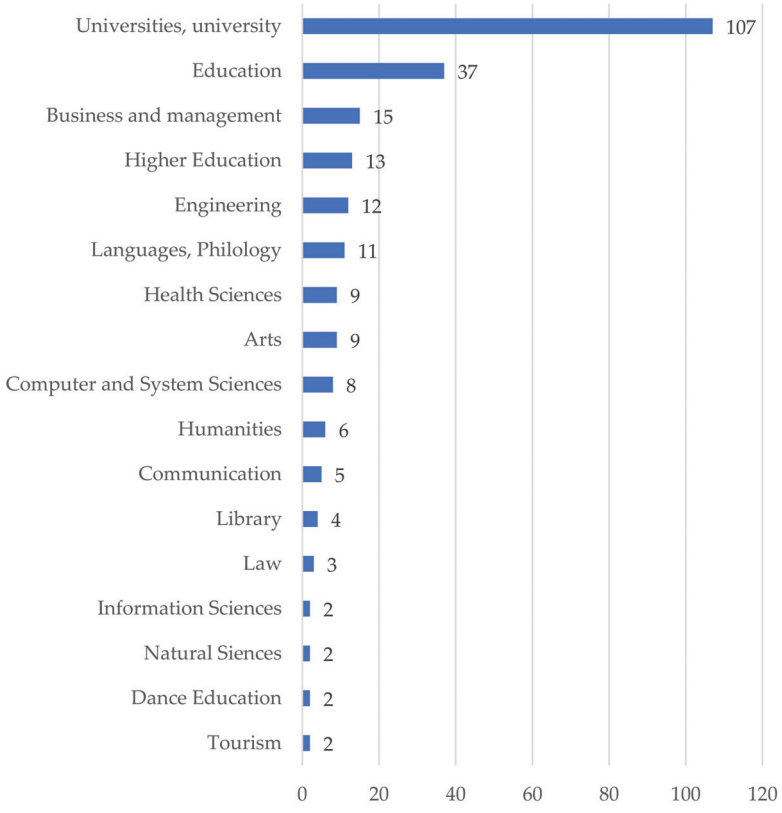



**Figure 8.** Productivity according to the academic area.

## 4. Discussion and Conclusions

The research carried out contributes to the integration of the DLSC among the objectives of higher education insofar as it analyzes and measures the scientific production in this regard, providing the necessary basis to undertake this type of process successfully [44,85,98,100]. Since 1997, the date of the first publication on DLSC in higher education, a total of 220 documents on the subject have been in publications of the Scopus database and considerable growth has been observed since 2017, with 2020 being the year with the highest production. The trend observed is fundamentally due to the growing presence of technology in all areas of society, including education [16,44,101]. Regarding the type of documents, as in other research on the incorporation of technologies and their requirements in the programs and objectives of higher education [44,83,84,97], articles predominate (143) representing 65% of the total of documents together with the conference papers (51) representing 23%. The results in this area corroborate that researchers focus their efforts on articles because of their impact and credibility within the scientific community [44] and for the accreditation and evaluation of teaching staff. Given the relevance of this type of document, the next objective focuses precisely on the productivity of magazines. In this area, there is a concentration on a few supports, specifically two, as well as a great diversity of magazines that have shown interest in the subject, publishing 1 or more articles. The reality described shows the relevance of the investigated topic and its interdisciplinary nature as it is not limited to specialized journals, even in the case of the two that have stood

out for the volume of articles since one of them is oriented to Learning Technology while the other focuses on Early Childhood Special Education. Closing the general description of scientific production on DLSC, in relation to the authors and authors, the dispersion observed at the level of the journals is maintained. There are many authors who have been interested in the subject, but few continue in this line of research. This is not an encouraging fact because the constant evolution of ICT requires a constant study and evaluation of their integration in the higher education sphere as teaching-learning tools and also as an educational objective [11–13]. Despite the dispersion observed, the large number of authors and research allows us to foresee that the growing trend that has been observed for several years will continue in the medium-short term. Regarding the most prolific authors, it should be noted that both are women and, with totally opposite profiles as regards the rate of publications and citations in Scopus.

Once this first analysis of the basic characteristics of scientific production on DLSC was carried out, a more in-depth study was carried out in relation to different aspects of its contents. In the first place, the nature of the investigations has been approached, verifying a wide presence of studies of an experimental nature compared to the theoretical ones that, however, predominated in the first years. This evolution reflects that of the integration of ICT in the classroom because more experimental investigations based on case studies have been developed as these tools have been implemented. The observed trend has also been verified in previous research on ICT in higher education [19,31,85,98]. Regarding the geographical scope, those that focus on a single area, country, city, etc., stand out. However, within this same category, a great variety and diversity are observed confirming the relevance and impact of the topic investigated worldwide, even though it is also possible to verify a clear predominance of European countries, with the United Kingdom as the maximum exponent.

In this line of research on DLSC, most studies focus on students, and to a lesser extent on teachers, even though their DL is key in order to achieve the ones of the students. Likewise, regarding the population under study, it is found that most studies focus on a single segment while a minority covers more than one group.

Lastly, the documents are classified according to the academic area or discipline being studied. The results indicate a limited specialization since most of the documents are categorized in 'universities, university' as they have not been carried out in any specific area, but in the field of one or several universities. Apart from these, in the group made up of research on a specific area, the one on 'Education' stands out, noting the interest of the academic community regarding the training of future teachers in ICT. As pointed out by Rodríguez-Jiménez et al. [44] higher education is a fundamental stage in the training of future professionals in any field, especially in the case of those who are going to become teachers, because the training of future generations of professionals depends on them. Although the results observed in relation to the studies in the field of 'Education' contrast with the lack of studies on the DL of teachers, previously verified, it also shows the concern and interest of researchers and teachers to guarantee the DL of future teachers.

Finally, regarding the presence of tourism studies, only two documents have been found and, in both cases, they are not exclusively limited to this discipline. This contradicts previous research that found specialization as a characteristic feature of research on literacy, and specifically on DL [9,30–32]. To the results obtained in the SCOPUS database, it is necessary to add other investigations located in other databases that have served to build the theoretical framework and that contrast with the results presented because they focus on tourism, on teachers and are largely signed by the same authors [37–39].

In general terms, it can be concluded that publications on DLSC are approached from different research perspectives, and range from concrete descriptions of teaching–learning methodologies and procedures and how future teachers should use ICT, to more normative approaches [9,16,43] but they are not characterized by specialization and personalization that is crucial at the present time given the degree of professionalization of the current labor market. Organizations, in general terms, must adapt to the new challenges imposed

by global economic, social, technological, etc. transformations while preserving their competitiveness [61,102]. For this, the development, access, and use of ICTs is not only a key factor but is necessary [103]. In the tourism sector, an industry that has become a source of economic and social development in many territories [61,89], ICTs have generated new opportunities [104] but also the need for more trained professionals in this field who can exploit their full potential to the maximum [63].

The digital information age presents opportunities, but also challenges when it comes to destination marketing and management [68,105,106]. These challenges require the involvement of training institutions in the sense of providing future professionals with the necessary tools to face them [40,41,69] because human resources are crucial to achieving a real advantage in the global tourism industry, characterized by its volatility and competitiveness [107]. The results obtained represent a contribution to the academic and professional fields since scientific activity is evaluated with respect to DLSC in higher education, providing crucial information to tackle the challenges described [44,85,98,100]. Higher education and ICT must form an indissoluble pairing that serves as a model for the previous educational stages, becoming a source of theoretical and practical knowledge about DL, about how to turn students into expert professionals in the creation, development, and use of ICT. This is the goal pursued by this study and which has been materialized in a photograph of the evolution and current state of the scientific literature on DLSC, with special attention to studies on tourism. The meager results obtained in this regard contrast with the relevance of ICT in the corresponding sector, conferring added value to the line of research initiated in terms of its projection, since for tourism students the integration of ICT in their face training is crucial upon their incorporation into the professional field [40] and this process will not be successful unless their DL is previously undertaken.

Despite the achievement of the goal and objectives, the research carried out is not exempt from limitations that are established as next phases or future lines. These are mainly related to the sample that should be expanded to other relevant databases such as Web of Science (WOS) as well as to other teaching areas and disciplines, giving it a global approach and a new perspective that addresses the universal and global nature of the DL.

**Author Contributions:** Conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, D.C.-D. and A.-M.M.-S.; writing—review and editing, visualization and supervision, D.C.-D., A.-M.M.-S. and A.B.-B. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Data sharing not applicable.

**Acknowledgments:** This work has been completed thanks to the collaboration of the research groups on Experiential Marketing, Events and Integrated Communication (MAE-CO) of the University of Alicante, and the research group on Strategic Communication Management (GCE) of the Private University of La Loja.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Hinojo-Lucena, F.J.; Aznar-Díaz, I.; Cáceres-Reche, M.P.; Romero-Rodríguez, J.M. Artificial intelligence in higher education: A bibliometric study on its impact in the scientific literature. *Educ. Sci.* **2019**, *9*, 51. [CrossRef]
2. Darwish, A.; Lakhtaria, K.I. The Impact of the New Web 2.0 Technologies in Communication, Development, and Revolutions of Societies. *J. Adv. Inf. Technol.* **2011**, *2*, 204–216. [CrossRef]
3. O'Reilly, T. What is the Web 2.0. Design Patterns and Business Models for the Next Generation of Software. Available online: https://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html (accessed on 9 March 2021).
4. Morimoto, S.A.; Friedland, L.A. The lifeworld of youth in the information society. *Youth Soc.* **2011**, *43*, 549–567. [CrossRef]
5. León, M.E.L.; Medina, H.S. Las TIC. Un nuevo escenario para el desarrollo local de las comunidades. *Opcion* **2016**, *32*, 71–94.

6. Dornaleteche, J.; Buitrago, A.; Moreno, L. Categorization, item selection and implementation of an online digital literacy test as media literacy indicator. *Comunicar* **2015**, *22*, 177–185. [CrossRef]
7. Tur, G.; Urbina, S. La colaboración en eportafolios con herramientas de la Web 2.0 en la formación docente inicial. *Cult. Educ.* **2016**, *28*, 601–632. [CrossRef]
8. Stopar, K.; Bartol, T. Digital competences, computer skills and information literacy in secondary education: Mapping and visualization of trends and concepts. *Scientometrics* **2019**, *118*, 479–498. [CrossRef]
9. Peña-Acuña, B.; Martínez-Sala, A.-M.; Felipe Morales, A. Flexibilidad en Apps de cuentos de realidad aumentada. *Utopía Prax. Latinoam.* **2020**, *25*, 225–243. [CrossRef]
10. Ocaña-Fernández, Y.; Fernández, L.A.V.; Chiparra, W.E.M.; Gallarday-Morales, S. Digital skills and digital literacy: New trends in vocational training. *Int. J. Early Child. Spec. Educ.* **2020**, *12*, 370–377. [CrossRef]
11. Martínez-Sala, A.-M.; Alemany-Martínez, D. Integración eficiente de redes sociales como herramientas complementarias de aprendizaje y para la alfabetización digital en los estudios superiores de Publicidad y RR. PP. In *El Compromiso Académico y Social a Través de la Investigación e Innovación Educativas en la Enseñanza Superior*; Roig-Vila, R., Ed.; Ediciones Octaedro: Barcelona, Spain, 2018; pp. 1126–1136, ISBN 978-84-17219-25-3.
12. McMahon, M. Ensuring the development of Digital Literacy in higher education curricula. In Proceedings of the Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education, Dunedin, New Zealand, 23–26 November 2014; pp. 524–528.
13. Domingo-Coscollola, M.; Bosco-Paniagua, A.; Carrasco-Segovia, S.; Sánchez-Valero, J.-A. Fomentando la competencia digital docente en la universidad: Percepción de estudiantes y docentes. *Rev. Investig. Educ.* **2019**, *38*, 167–182. [CrossRef]
14. Barrientos-Báez, A. GDS Amadeus. Propuesta de innovación didáctica. In *TIC Actualizadas para una nueva Docencia Universitaria*; Durán Medina, J.V., Durán Valero, I., Eds.; McGraw-Hill: New York, NY, USA, 2016; pp. 17–30, ISBN 9788448612658.
15. Odede, I.; Jiyane, G. Exploring dimensional constructs of digital literacy skills for higher education. *Libr. Philos. Pract.* **2019**, *2019*, 2806.
16. Spante, M.; Hashemi, S.S.; Lundin, M.; Algers, A. Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Educ.* **2018**, *5*, 1–21. [CrossRef]
17. Katzlinger, E.; Niederländer, U. Supporting virtual learning for digital literacy: First experiences with a mobile app and gamification elements. *Proc. Eur. Conf. e-Learn.* **2018**, *2018*, 235–244.
18. Peled, Y. Pre-service teacher's self-perception of digital literacy: The case of Israel. *Educ. Inf. Technol.* **2020**. [CrossRef] [PubMed]
19. Sánchez-Caballé, A.; Gisbert-Cervera, M.; Esteve-Mon, F. The digital competence of university students: A systematic literature review. *Aloma* **2020**, *38*, 63–74. [CrossRef]
20. Almansa-Martinez, A.; Van-Zummeren Moreno, G.; Haro, R. Functionalities of Moodle and Edmodo in the Middle and Higher Educations. *Rev. Comun. SEECI* **2019**, *50*, 87–105. [CrossRef]
21. Salas-Rueda, R.-A.; Salas-Rueda, R.-D. Análisis Sobre El Uso De La Red Social Facebook En El Proceso De Enseñanza-Aprendizaje Por Medio De La Ciencia De Datos Tt—Analysis on the Use of the Social Network Facebook in the Teaching-Learning Process Through Data Science Analises Sobre O Uso Da. *Rev. Comun. SEECI* **2020**, *1*, 1–26.
22. Law, N.; Woo, D.; de la Torre, J.; Wong, G. *A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2.*; UNESCO: Paris, France, 2018.
23. Julien, H. Digital literacy in theory and practice. In *Encyclopedia of Information Science and Technology*; Khosrow-Pour, M., Ed.; IGI Global: Hershey, PA, USA, 2018; pp. 22–32.
24. Neumann, M.M.; Finger, G.; Neumann, D.L. A conceptual framework for emergent digital literacy. *Early Child. Educ. J.* **2017**, *45*, 471–479. [CrossRef]
25. Holt, D.; Smissen, I.; Segrave, S. New students, new learning, new environments in higher education: Literacies in the digital age. In Proceedings of the 23rd Annual Ascilite Conference of the Australasian Society for Computers in Learning in Tertiary Education: Who's Learning? Whose Technology? Sydney, Australia, 3–6 December 2006; pp. 327–337.
26. Pugacheva, N.; Kirillova, T.; Kirillova, O.; Luchinina, A.; Korolyuk, I.; Lunev, A. Digital paradigm in educational management: The case of construction education based on emerging technologies. *Int. J. Emerg. Technol. Learn.* **2020**, *15*, 96–115. [CrossRef]
27. English, J.A. A Digital Literacy Initiative in Honors: Perceptions of Students and Instructors about its Impact on Learning and Pedagogy. *J. Natl. Coll. Honor. Counc.* **2016**, *17*, 125–155.
28. Starčič, A.I.; Cotic, M.; Solomonides, I.; Volk, M. Engaging preservice primary and preprimary school teachers in digital storytelling for the teaching and learning of mathematics. *Br. J. Educ. Technol.* **2016**, *47*, 29–50. [CrossRef]
29. Varga-Atkins, T. Beyond description: In search of disciplinary digital capabilities through signature pedagogies. *Res. Learn. Technol.* **2020**, *28*, 1–19. [CrossRef]
30. Murray, M.C.; Pérez, J. Unraveling the Digital Literacy Paradox: How Higher Education Fails at the Fourth Literacy. *Issues Informing Sci. Inf. Technol.* **2014**, *11*, 85–100. [CrossRef]
31. Recio Muñoz, F.; Silva Quiroz, J.; Abricot Marchant, N. Análisis de la Competencia Digital en la Formación Inicial de estudiantes universitarios: Un estudio de meta-análisis en la Web of Science. *Píxel-BIT Rev. Medios Educ.* **2020**, 125–146. [CrossRef]
32. Oliveira, C.; Lopes, J.; Spear-Swerling, L. Teachers' academic training for literacy instruction. *Eur. J. Teach. Educ.* **2019**, *42*, 315–334. [CrossRef]
33. You, Y. Online technologies in dance education (China and worldwide experience). *Res. Danc. Educ.* **2020**. [CrossRef]

34. Hunma, A. Students make history every day just by sitting on these steps: Performative spaces and re-genring in the south. *Educ. Chang.* **2018**, *22*, 1–25. [CrossRef]
35. Shopova, T. Digital literacy of students and its improvement at the university. *J. Effic. Responsib. Educ. Sci.* **2014**, *7*, 26–32. [CrossRef]
36. Phuapan, P.; Viriyavejakul, C.; Pimdee, P. An analysis of Digital Literacy Skills among Thai University Seniors. *Int. J. Emerg. Technol. Learn.* **2016**, *11*, 24–31. [CrossRef]
37. Avello, R.; López, R.; Gómez, M.; Espinosa, G.; Vázquez, S. Necesidades de formación en TIC de los docentes de las escuelas de Hotelería y Turismo cubanas. *IJERI Int. J. Educ. Res. Innov.* **2014**, *1*, 15–28.
38. Avello-Martínez, R.; López-Fernández, R.; Alpizar-Fernández, R. Sistema de formación continua para la alfabetización digital de los docentes de la escuela de hotelería y turismo de Cienfuegos. *Rev. Educ. Distancia* **2016**. [CrossRef]
39. Avello-Martínez, R.; López Fernández, R. Digital literacy for teachers in Cuban Tourism and Hotel Management Schools. Some experiences on its development. *RUSC. Univ. Knowl. Soc. J.* **2015**, *12*, 3. [CrossRef]
40. Cowie, B.; Khoo, E. Digital tools disrupting tertiary students' notions of disciplinary knowledge: Cases in history and tourism. *Educ. Sci.* **2014**, *4*, 87–107. [CrossRef]
41. Infante-Moro, A.; Infante-Moro, J.; Gallardo-Pérez, J. The acquisition of ICT skills at the university level: The case of the Faculty of Business Studies and Tourism of the University of Huelva. *Pixel-Bit Rev. Medios Educ.* **2021**, 29–58. [CrossRef]
42. Pérez-Mateo, M.; Romero, M.; Romeu-Fontanillas, T. Collaborative construction of a project as a methodology for acquiring digital competences. *Comunicar* **2014**, *21*, 15–23. [CrossRef]
43. Lea, M.R. Reclaiming literacies: Competing textual practices in a digital higher education. *Teach. High. Educ.* **2013**, *18*, 106–118. [CrossRef]
44. Rodríguez Jiménez, C.; Sanz Prieto, M.; Alonso García, S. Technology and higher education: A bibliometric analysis. *Educ. Sci.* **2019**, *9*, 169. [CrossRef]
45. Huertas, A.; Marine-Roig, E. Differential destination content communication strategies through multiple Social Media. In *Information and Communication Technologies in Tourism 2016*; Inversini, A., Schegg, R., Eds.; Springer: Cham, Switzerland, 2016; pp. 239–252.
46. Ivars-Baidal, J.A.; Celdrán-Bernabeu, M.A.; Mazón, J.-N.; Perles-Ivars, Á.F. Smart destinations and the evolution of ICTs: A new scenario for destination management? *Curr. Issues Tour.* **2019**, *22*, 1581–1600. [CrossRef]
47. Petrović, J.; Milićević, S.; Djeri, L. The information and communications technology as a factor of destination competitiveness in transition countries in European Union. *Tour. Econ.* **2016**, *23*, 1353–1361. [CrossRef]
48. Marine-Roig, E.; Huertas, A. How safety affects destination image projected through online travel reviews. *J. Destin. Mark. Manag.* **2020**, *18*, 100469. [CrossRef]
49. Martínez-Sala, A.-M. ¡Hay turismo después del COVID-19!: Una crisis para la reflexión y el cambio. *Desarro. Econ. Soc.* **2020**, *9*, 43–53. [CrossRef]
50. Williams, C.C. Impacts of the coronavirus pandemic on Europe's tourism industry: Addressing tourism enterprises and workers in the undeclared economy. *Int. J. Tour. Res.* **2020**, 1–10. [CrossRef]
51. Huertas, A.; Oliveira, A.; Girotto, M. Crisis communication management by the national tourist organizations of spain and italy in the face of COVID-19. *Prof. Inf.* **2020**, 1–19. [CrossRef]
52. Villa, F.G.; Litago, J.D.U.; Sánchez-Fdez, A. Perceptions and expectations in the university students from adaptation to the virtual teaching triggered by the covid-19 pandemic. *Rev. Lat. Comun. Soc.* **2020**, *2020*, 99–119. [CrossRef]
53. Tejedor, S.; Cervi, L.; Tusa, F.; Parola, A. Education in times of pandemic: Reflections of students and teachers on virtual university education in Spain, Italy and Ecuador. *Rev. Lat. Comun. Soc.* **2020**, *2020*, 1–21. [CrossRef]
54. Gössling, S. Tourism, technology and ICT: A critical review of affordances and concessions. *J. Sustain. Tour.* **2021**. [CrossRef]
55. Zaidan, E. Analysis of ICT usage patterns, benefits and barriers in tourism SMEs in the Middle Eastern countries: The case of Dubai in UAE. *J. Vacat. Mark.* **2016**, *23*, 248–263. [CrossRef]
56. Ukpabi, D.C.; Karjaluoto, H. Consumers' acceptance of information and communications technology in tourism: A review. *Telemat. Inform.* **2017**, *34*, 618–644. [CrossRef]
57. Gössling, S. Tourism, information technologies and sustainability: An exploratory review. *J. Sustain. Tour.* **2017**, *25*, 1024–1041. [CrossRef]
58. Fernández Paradas, R.; Sánchez Guzmán, R. La revolución Youtube y su influencia en la construcción de las identidades locales por medio de la Semana Santa. *Rev. Cienc. Comun. Inf.* **2018**, *23*, 53–66. [CrossRef]
59. Walls Ramírez, M. Aportes de la comunicación para la difusión del patrimonio cultural. *Rev. Cienc. Comun. Inf.* **2020**, *25*, 49–55. [CrossRef]
60. Gjika, I.; Pano, N. Effects of ICT in Albanian tourism business. *Acad. J. Interdiscip. Stud.* **2020**, *9*, 252–263. [CrossRef]
61. Milićević, S.; Petrović, J.; Dordević, N. ICT as a factor of destination competitiveness: The case of the republics of former Yugoslavia. *Manag. Mark.* **2020**, *15*, 381–392. [CrossRef]
62. Porter, M. Strategy and the Internet. *Harv. Bus. Rev.* **2001**, *3*, 2–19.
63. Bilotta, E.; Bertacchini, F.; Gabriele, L.; Giglio, S.; Pantano, P.S.; Romita, T. Industry 4.0 technologies in tourism education: Nurturing students to think with technology. *J. Hosp. Leis. Sport Tour. Educ.* **2020**. [CrossRef]

64. Cooper, C.; Shepherd, R. The Relationship Between Tourism Education and The Tourism Industry: Implications for Tourism Education. *Tour. Recreat. Res.* **1997**, *22*, 34–47. [CrossRef]
65. Baum, T. Human resources in tourism: Still waiting for change. *Tour. Manag.* **2007**, *28*, 1383–1399. [CrossRef]
66. Buhalis, D.; Amaranggana, A. *Smart Tourism Destinations Enhancing Tourism Experience Through Personalisation of Services BT—Information and Communication Technologies in Tourism 2015*; Tussyadiah, I., Inversini, A., Eds.; Springer: Cham, Switzerland, 2015; pp. 377–389.
67. Gretzel, U.; Sigala, M.; Xiang, Z.; Koo, C. Smart tourism: Foundations and developments. *Electron. Mark.* **2015**, *25*, 179–188. [CrossRef]
68. Gretzel, U.; Yuan, Y.-L.; Fesenmaier, D.R. Preparing for the New Economy: Advertising Strategies and Change in Destination Marketing Organizations. *J. Travel Res.* **2000**, *39*, 146–156. [CrossRef]
69. Balbuena, A.; Salinas, D.S.; Suasnavas, M.G. Explorando la posibilidad de implementar un posgrado de turismo en Loja (Ecuador). *Rev. Espac.* **2019**, *40*, 2017–2021.
70. Abdul-Ghani, M. Hospitality and Tourism Education in the Making. *J. Teach. Travel Tour.* **2006**, *6*, 71–87. [CrossRef]
71. Agüero Pérez, M.M.; López Fraile, L.A.; Pérez Expósito, J. Challenge Based Learning como modelo de aprendizaje profesionalizante. Caso del programa Universidad Europea con Comunica +A. *Vivat Acad.* **2019**, *149*, 1–24. [CrossRef]
72. Sabich, M. De los libros de texto a los portales educativos: Un análisis sociosemiótico sobre sus estrategias discursivas. El caso de Introducción a la Comunicación y Educar. *Perspect. Comun.* **2015**, *8*, 59–93.
73. Cuéllar Santiago, F.; López-Aparicio Pérez, I. Vieo Art as a methodological tool and creative catalyst. The acquisition of competences in Media Literacy with the help of emotions. *Vivat Acad.* **2020**, *151*, 127–156. [CrossRef]
74. Gordillo, A. Comunicación y Educación en contextos mediados: Nuevos desafíos para la construcción y difusión del conocimiento. *Perspect. Comun.* **2015**, *8*, 7–23.
75. García-Marín, D. Transpodcast universe. Narrative models and independent community. *Hist. Comun. Soc.* **2020**, *25*, 139–149. [CrossRef]
76. Assante, L.M.; Huffman, L.; Harp, S.S. A Taxonomy of Academic Quality Indicators for U.S.-Based 4-Year Undergraduate Hospitality Management Programs. *J. Hosp. Tour. Res.* **2009**, *34*, 164–184. [CrossRef]
77. Durán Medina, J.F.; Vega Baeza, M.R. Las tecnologías de la información y de la comunicación en las facultades de educación. *Ilu* **2013**, *18*, 313–326. [CrossRef]
78. Arroyo-Vázquez, N.; Gómez-Hernández, J.-A. La biblioteca integrada en la enseñanza universitaria online: Situación en España. *Prof. Inf.* **2020**, 1–11. [CrossRef]
79. Calvo-Rubio, L.-M.; Ufarte-Ruiz, M.-J. Percepción de docentes universitarios, estudiantes, responsables de innovación y periodistas sobre el uso de inteligencia artificial en periodismo. *Prof. Inf.* **2020**, *29*, 1–14. [CrossRef]
80. Gursoy, D.; Swanger, N. An Industry-Driven Model of Hospitality Curriculum for Programs Housed in Accredited Colleges of Business. *J. Hosp. Tour. Educ.* **2004**, *16*, 13–20. [CrossRef]
81. Gursoy, D.; Swanger, N. An Industry-Driven Model of Hospitality Curriculum for Programs Housed in Accredited Colleges of Business: Part II. *J. Hosp. Tour. Educ.* **2005**, *17*, 46–56. [CrossRef]
82. Akçayır, M.; Akçayır, G. Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educ. Res. Rev.* **2017**, *20*, 1–11. [CrossRef]
83. Repiso, R.; Fonseca-Mora, M.C. Aproximación Bibliométrica del Desarrollo e Impacto de la Investigación Internacional en Alfabetización Audiovisual (1960–2011). *Rev. Cient. Comun. Tecnol. Emerg.* **2012**, *10*, 43–61. [CrossRef]
84. Lorenzo Lledó, G.; Scagliarini Galiano, C. Revisión bibliométrica sobre la realidad aumentada en Educación. *Rev. Gen. Inf. y Doc.* **2018**, *28*, 45–60. [CrossRef]
85. Fernández Batanero, J.M.; Reyes Rebollo, M.M.; Montenegro Rueda, M. Impact of ICT on students with high abilities. Bibliographic review (2008–2018). *Comput. Educ.* **2019**, *137*, 48–58. [CrossRef]
86. Bond, M.; Zawacki-Richter, O.; Nichols, M. Revisiting five decades of educational technology research: A content and authorship analysis of the British Journal of Educational Technology. *Br. J. Educ. Technol.* **2019**, *50*, 12–63. [CrossRef]
87. Bhatt, I.; MacKenzie, A. Just Google it! Digital literacy and the epistemology of ignorance. *Teach. High. Educ.* **2019**, *24*, 302–317. [CrossRef]
88. Elphick, M. The impact of embedded ipad use on student perceptions of their digital capabilities. *Educ. Sci.* **2018**, *8*, 102. [CrossRef]
89. Martínez-Sala, A.-M.; Cifuentes Albeza, R.; Martínez-Cano, F.J. Las redes sociales de las organizaciones de marketing de destinos turísticos como posible fuente de eWOM. *Observatorio* **2018**, *12*, 246–271. [CrossRef]
90. López, E.P.; Barrientos, A.; Martínez, J.A. La transformación digital del turismo. *Rev. Occident.* **2020**, *464*, 52–66.
91. Lerario, A.; Varasano, A.; Di Turi, S.; Maiellaro, N. Smart Tirana. *Sustainability* **2017**, *9*, 2338. [CrossRef]
92. Li, Y.; Hu, C.; Huang, C.; Duan, L. The concept of smart tourism in the context of tourism information services. *Tour. Manag.* **2017**, *58*, 293–300. [CrossRef]
93. Vangrieken, K.; Dochy, F.; Raes, E.; Kyndt, E. Teacher collaboration: A systematic review. *Educ. Res. Rev.* **2015**, *15*, 17–40. [CrossRef]
94. Fernández-Cano, A.; Bueno, A. Synthesizing scientometric patterns in Spanish educational research. *Scientometrics* **1999**, *46*, 349–367. [CrossRef]

95. Villalba Trujillo, R.; Martínez Caro, L.; Martínez María-Dolores, S.-M. Regional analysis of tourism companies online in Spain. *Cuad. Tur.* **2014**, *34*, 335–349.
96. Diem, A.; Wolter, S.C. The Use of Bibliometrics to Measure Research Performance in Education Sciences. *Res. High. Educ.* **2013**, *54*, 86–114. [CrossRef]
97. Tibaná-Herrera, G.; Fernández-Bajón, M.T.; De Moya-Anegón, F. Categorization of an emerging discipline in the world publication system (SCOPUS): E-learning. *arXiv* **2017**, arXiv:1710.05723.
98. González-Zamar, M.D.; Abad-Segura, E. Implications of virtual reality in arts education: Research analysis in the context of higher education. *Educ. Sci.* **2020**, *10*, 225. [CrossRef]
99. O'Connor, S.; Daly, C.S.; MacArthur, J.; Borglin, G.; Booth, R.G. Podcasting in nursing and midwifery education: An integrative review. *Nurse Educ. Pract.* **2020**, *47*, 102827. [CrossRef]
100. Mayes, R.; Natividad, G.; Spector, J.M. Challenges for educational technologists in the 21st century. *Educ. Sci.* **2015**, *5*, 221–237. [CrossRef]
101. Almenara, J.C.; Vázquez-Cano, E.; Meneses, E.L.; Martínez, A.J. Formative possibilities of augmented technology. A diachronic study in University Scenarios. *Rev. Complut. Educ.* **2020**, *31*, 141–152. [CrossRef]
102. Drăgoi, M.C.; Andrei, J.V.; Mieilă, M.; Panait, M.; Dobrotă, C.E.; Lădaru, R.G. Food safety and security in Romania–an econometric analysis in the context of national agricultural paradigm transformation. *Amfiteatru Econ.* **2018**, *20*, 134–151. [CrossRef]
103. Bejtkovský, J.; Copca, N. The Employer Branding Creation and HR Marketing in Selected Healthcare Service Providers. *Manag. Mark.* **2020**, *15*, 95–108. [CrossRef]
104. Manente, M.; Minghetti, V. Destination management organizations and actors. In *Tourism Business Frontiers. Consumers, Products and Industry*; Buhalis, D., Costa, C., Eds.; Elsevier Butterworth-Heinemann: Oxford, UK, 2006; pp. 228–237.
105. Pike, S.; Page, S.J. Destination Marketing Organizations and destination marketing: Anarrative analysis of the literature. *Tour. Manag.* **2014**, *41*, 202–227. [CrossRef]
106. Minghetti, V.; Buhalis, D. Digital Divide in Tourism. *J. Travel Res.* **2009**, *49*, 267–281. [CrossRef]
107. Mayaka, M.; Akama, J.S. Systems approach to tourism training and education: The Kenyan case study. *Tour. Manag.* **2007**, *28*, 298–306. [CrossRef]

education sciences

MDPI

*Article*

# Portuguese Primary and Secondary Education in Times of COVID-19 Pandemic: An Exploratory Study on Teacher Training and Challenges

**Susana Henriques [1,*], Joana Duarte Correia [2] and Sara Dias-Trindade [3]**

[1] Centro de Investigação e Estudos de Sociologia (CIES-Iscte), Iscte—Instituto Universitário de Lisboa/ Universidade Aberta (UAb), 1649-026 Lisboa, Portugal
[2] Centro de Investigação e Estudos de Sociologia (CIES-Iscte), Iscte—Instituto Universitário de Lisboa, 1649-026 Lisboa, Portugal; Joana_Telma_Correia@iscte-iul.pt
[3] Centro de Estudos Interdisciplinares, Faculdade de Letras (DHEEAA), Universidade de Coimbra, 3000-186 Coimbra, Portugal; sara.trindade@uc.pt
* Correspondence: Susana_Alexandra_Henriques@iscte-iul.pt

**Abstract:** The discussion about the use of digital technologies in education is not new. However, the COVID-19 pandemic and the total closure of schools around the world, that forced millions of students to attend their classes from home, has demonstrated the importance of this discussion. It has highlighted the need to revisit debates about the interactions between technology and education, and the added value of digital resources to enhance the educational process. This article, based on an exploratory analysis, aims to understand how the transition from face-to-face to digital was accomplished in Portuguese primary and secondary education, namely regarding teacher training and the difficulties experienced during the emergency remote education period. The data analysed in this article were collected through an online questionnaire, disseminated through online social networks, and answered by 136 Portuguese primary and secondary education teachers. The questions focused on this article were open-ended, and the information collected was analysed using content analysis methodology. The results show how teachers have been forced to modify their pedagogical work, the importance of training, and the inherent challenges and critical reflections associated with the process, as well as the opportunities presented in a post-pandemic educational reality.

**Keywords:** teachers; training; technologies; COVID-19; pedagogy; challenges

**Citation:** Henriques, S.; Correia, J.D.; Dias-Trindade, S. Portuguese Primary and Secondary Education in Times of COVID-19 Pandemic: An Exploratory Study on Teacher Training and Challenges. *Educ. Sci.* **2021**, *11*, 542. https://doi.org/10.3390/educsci11090542

Academic Editors: Jose Ángel Martínez-López, Cristina Lázaro-Pérez, José Gómez Galán and Diego Vergara

Received: 30 July 2021
Accepted: 9 September 2021
Published: 15 September 2021



## 1. Introduction

On 16 March 2020, the structure of the physical classroom in Portuguese schools changed dramatically. Due to the pandemic caused by the COVID-19 virus, the integration of digital technologies in education rapidly became an obligation, when it had previously been a direction followed only by a few. The impossibility of students being physically in schools accelerated an emerging digital transition process in Portugal (Action Plan for the Digital Transition of Portugal), which involved training teachers and responding to the lack of technological resources and poor Internet connectivity. Quick measures led to the development of emergency remote teaching, which was both different and distant from concepts such as digital education or E@D [1].

Even before the pandemic resulting from the COVID-19 virus, several media were already reporting on school and educational systems that were trying to break with traditional views of learning, moving to collective learning environments using technologies. These experiences were already proving that technologies are essential to facilitate the management of autonomy in these contexts, using, for example, project-based learning, blended learning, flipped learning, or active participation of students in various online social spaces. However, in 2020, emergency remote teaching was implemented in a country

where most schools had not yet effectively integrated digital technologies into a pedagogical strand. Furthermore, the use of such technologies and the associated training necessary for creating an innovative, dynamic, meaningful, and qualitative pedagogical practice was not yet a priority. In this context, digital technology has truly positioned itself as the dominant aspect of literacy, although being digitally competent depends more on a set of knowledge, skills, and attitudes than on access to technologies and knowing how to use them [2]. This was evident in the way teachers dealt with the situation that was forced upon them by the emergency, which required a lot of effort. In some cases, there was a transposition of physical classes to digital environments; in other cases, teachers tried to learn more about digital education in order to put different strategies into practice in their classes.

The pandemic, therefore, demonstrated the need to integrate technology into teaching-learning processes, linking scientific, pedagogical, and technological knowledge, as well as highlighting the need for adequate tools and resources. This is essential in order to be able to adjust pedagogical models and practices to the needs of contemporary and future students, who may even have jobs that do not exist yet, as they live surrounded by digital technologies. Students tend to be unable to learn without technologies, but they have to learn how to pedagogically interact with them and need to not only acquire knowledge, but also develop learning skills, thus helping them to achieve professional and personal success. It is important to highlight these processes with further research centred on the actors involved: teachers and students.

In this scope, this paper presents an exploratory study aiming to understand how the transition from face-to-face environments to virtual ones was made in primary and secondary education in Portugal, namely regarding how teachers felt and how they reacted to the sudden change, as well as how post-pandemic education in Portugal will be affected by this experience.

## 2. Education and the Pandemic in Portugal: Embedding Digital Thinking in Schools

The beginning of 2020 saw the emergence of a pandemic that caused disturbances at different levels in schools all over the world. In Portugal, people in society, and schools in particular, do not have equitable access to digital technology. This issue developed new contours, as the pandemic exposed the need to focus on areas of digital literacy, digital skills, and digital fluency.

Facing the need of a transition to an emergency remote education [1], the weaknesses of an entire system based on digital technologies and resources became more evident, showing the importance of having digital skills in different areas of teaching practice [3]. In a country with different rates of technological connection, it was clearly seen that an education empowered by digital technology was still an idea under construction.

Given the centralised organisational characteristics of school administration and management [4], the Portuguese Ministry of Education, through the Directorate General of Education, took on the preparation of a set of guidelines and training actions aimed at teachers. Such initiatives were designed to support teachers in the transition from a face-to-face education model to a completely virtual one, seeking, in parallel, to support students who did not have access to technological devices or Internet connectivity [5].

In this context, the Portuguese Council of Ministers approved the Action Plan for Digital Transition, which is assumed to be "the country's transformation engine" [6] (p. 8), and which aims to put into practice a diverse set of measures to provide the country's digitalisation. These measures are organised into three main pillars, the first one being dedicated to training and digital inclusion that includes digital education and requalification.

Within the scope of digital education, one of the objectives of youth training is the "transversal integration of technologies in the different curricular areas of basic and secondary education" [6] (p. 15). This objective refers to a transversal training, suitable to the skills for the 21st century, where the role of technology, as already mentioned in 2015 by the World Economic Forum [7], will be fundamental to ensure social and professional

equity for everyone in the world. The sub-pillar on professional requalification and training specifies teacher training among the measures to be adopted which will be essential for effective integration of technologies in educational practices.

The goals for the Portuguese school are in line with the idea of a digital school, where the teaching and learning processes are increasingly enriched by digital technologies, and where humans and non-humans interact collaboratively, in order to teach, learn, and build knowledge in an active and participatory way, thus making use of digital technology to bring "students closer to the productivity and collaboration tools that they can find in a professional work environment" [6] (p. 15).

The Ministry of Education (under the collaboration between the General Directorate of Education and the National Agency for Qualification and Vocational Education) created a supportive website for schools, which made a set of documents, guidelines, and resources available to the whole educational community, especially to teachers and headmasters. Moreover, a direct communication channel between schools and the Directorate General for Education was created through electronic mail, with the aim of providing a rapid response to queries and further support in the face of difficulties.

One of the first documents to be made available was the Roadmap—8 guiding principles for the implementation of Distance Learning (E@D) in Schools [8] which embodies a support tool for the "design of the best strategy and Plan for Distance Learning (E@D)". This generic document included the recommendation of the E@D Plan to be adapted according to the specificities of the school and social context, as well as the available resources. Without detailing the eight points that make up the Roadmap for the development of the E@D Plan, it is worth mentioning that it contains support for a rapid response to crisis, ensuring that instructional activities can be delivered remotely. Schools had to make their decision-making processes faster, without time for "the completion of fundamental steps for distance education initiatives to be successful. Steps such as planning, training of all involved, preparation of the technological infrastructure (hardware and software) ( . . . ) inclusion" [9] (p. 8). The result was, in general, the development of a set of methodologies and essentially expository practices, technologically mediated, and closer to the characteristics of emergency remote education than to distance education.

In another axis of the intervention are the training actions, the number of which increased exponentially, with some actions being more formal than others. Teachers attended on their own initiative or via proposals from a range of agencies including the organisation of the school or grouping, training centres of school associations, publishers, software companies, or even from offers that resulted from the organisation of the Ministry of Education through the Directorate General of Education. In this last group is the training course for Digital Networked Education, from a partnership between the Directorate General of Education (DGE in the Portuguese acronym) and the Portuguese Open University. This course was designed with the aim of promoting skills in the area of distance education in a double dimension, in primary and secondary school teachers: helping them to overcome the limitations imposed by the pandemic, but also promoting the development of "a new paradigm of a more hybrid education" [9] (p. 8).

In fact, the OECD [10] also identified this moment as an opportunity to change the predominant trend of teaching based on exposure and learning based on the passive reception of knowledge—a trend present in Portugal, which neglects ways to interact, question, and experiment. Thus, it is an opportunity for experimentation and the development of new models of education and new ways to make the most of face-to-face learning time. Specifically, four priority axes were identified: the exploration of secure systems for home-based assessment tests; the exploration of different models of time and schooling; the empowerment of teachers to make the most of digital advancement; and the use and monetisation of variations within and across countries for learning [10] (p. 3).

Under the Digital Transition Action Plan, the Government has defined the provision of individual equipment and free connectivity for both students and teachers, access to quality educational resources, and a strong focus on the digital training of teachers. Thinking about

the current events, but also a post-pandemic education, a teacher training process is now underway, following a policy that DGE has been defending for some years: specialised training, with a strong practical component and a schedule that allows teacher trainees to understand the training contents and put them into practice. Furthermore, it helps them to understand existing doubts and acquire new and relevant knowledge through practice and collaboration. This is pertinent, considering the point that was raised early in this article about the importance of training that contributes to an effective development of new skills.

The training prepared by the DGE, which included the participation of experts from various Portuguese universities (the Portuguese Open University, University of Évora, University of Lisbon), initially involved the training of trainers throughout the country, who were subsequently responsible for disseminating this training to the training centres network (CFAE in the Portuguese acronym) throughout the country. In this stage of training, all teachers were asked to answer the DigCompEdu CheckIn questionnaire so that they could be placed in level 1 or level 2 classes, depending on the results obtained.

The strong investment in teaching digital training also included the publication of the Order No. 2053/2021, which established that every training action carried out since March 2020 in the scope of a Digital Education is "exceptionally, considered as carried out in the scientific-pedagogical dimension of all recruitment groups" [11] (pp. 109–110). At the same time, each school should, in collaboration with its training centre and through its digital ambassadors, define a set of actions aimed at preparing its Digital Development Action Plan (PADD acronym in Portuguese). This elaborate pedagogical network which articulates the DGE, the CFAE, the schools, and the entire educational community should achieve an in-depth preparation, implementation, monitoring, and evaluation between 2021 and July 2023.

Further research is therefore required to understand these processes and our study intends to be a contribution. The research question guiding our exploratory study regards how the transition from face-to-face environments to virtual ones was made in primary and secondary education in Portugal. Namely, it is our goal to focus on teachers' perspectives about their feelings and reactions to the sudden changes and how post-pandemic education in Portugal will be affected by this experience.

## 3. Methodology

### *3.1. Study, Data Collection, and Participants*

The data used in this article set up an exploratory study and are the results of an online questionnaire, comprising 15 questions. The questionnaire was disseminated through online social networks and answered between April and August 2020. Respondents were 136 Portuguese primary and secondary education teachers, from both public and private schools geographically dispersed across mainland Portugal and its islands. Neither age nor gender were asked of participants, as other studies related to education and digital competences indicate that there are several factors that affect the greater or lesser teaching digital competence and that motivation and training are more relevant than age, gender, or even basic scientific area [12–14].

This method of recruitment was chosen since schools were closed during the data collection period. In the middle of the pandemic, the use and importance of online social networks increased, to the extent that several new communities were formed and/or strengthened with the purpose of supporting teachers in the remote teaching responses they were forced to develop (e-Learning Facebook support, for example).

The use of online questionnaires has increased as a result of the constraints imposed by the COVID-19 pandemic. The use of social media has revealed its potential for recruiting samples in research [15].

In this context, the present data collection process fits with others that have sought answers to the urgent need for new data collection strategies, with important advances in methodological development and with evidence of low bias in the data [16].

The larger questionnaire designed for the research aimed to understand the use of digital resources and environments for education purposes. The questions presented reflect four dimensions that were deemed relevant to characterise Portuguese teachers' perceptions of the transition to emergency remote education in the time of pandemic COVID-19. The dimensions were: (a) type of digital platforms used; (b) school and teacher training strategies; (c) digital divide; and (d) analysis of specific cases. For this article, we focused only on part of the findings, namely, the questions related to: (1) the ability to work with digital learning environments after the emergency pandemic remote experience, and (2) to the major difficulties faced by our respondents. Those questions were open-ended and the information collected was analysed with content analysis methodology [17,18]. The content analysis had two dimensions: the first one was conceptual analysis, aiming to identify the occurrence of selected terms in the data; the second one was relational analysis, aiming to identify relationships between such concepts and their meanings.

### *3.2. Project Ethics*

The research project that this article is based on is in line with the Ethical Charter published by the Portuguese Society of Education Sciences [19] and follows the guidelines linked to it. As argued by [20], the investigative process was always associated with high levels of vigilance and self-reflection regarding ethical issues.

The respondents' participation was voluntary, with the option of withdrawing from completing the questionnaire at any time [21]. Responses were anonymous and data were worked up together, with the results used only to address the objectives of the current research [21,22].

As stated by [23], the publication of these results takes on the strategic nature of information dissemination, as this is the best way to share knowledge in research where there is effectively no administrative record of the sample or contact with respondents (we recall that data collection was done online, through social media). It is therefore an integrated approach to data collection using non-probability, convenience sampling, taking advantage of the powerful segmentation resources of social networks and their virtual communities [15].

The data collected and the results obtained do not represent any type of restraint for the participants [24], with the authors assuming that the study of the contexts and practices of Portuguese teachers' performance during the pandemic resulting from the COVID-19 virus may translate into an outstanding contribution to the field of educational research.

## 4. Results and Discussion

### *4.1. Teacher Training Regarding the Use of Digital Resources and Environments for Education*

The survey included questions on teacher training regarding the use of digital resources and environments for education. When asked about specific training in this area before the pandemic lockdown, 67.7% answered affirmatively. These figures indicate that still about one third of teachers had not participated in any training in the area of educational technologies. This corresponds with a working class that mostly did its initial training more than 20 years ago (the average age of a Portuguese teacher is 49 years [25], a period during which digital learning was still largely unused in Portuguese schools and almost non-existent in the initial training of teachers).

This reality meant that many teachers, faced with the technological evolution that in the last 20 years has brought new equipment, new resources, and, above all, new possibilities into the school in a hyperconnected and multimodal world, needed to seek training that would give them the confidence to innovate. This is in line with the indices of confidence in an operational use of digital technologies (considered fundamental skills for a generic use of digital resources) presented in the 2013 European Commission report, which placed Portuguese teachers with high levels of confidence and always above the European average itself. It also highlighted the importance of training in increasing confidence levels,

stating that there are positive correlations between confidence in operational skills for the use of digital technologies and participation in training for professional development [26].

However, by itself, teacher training in this area is not enough to enable professionals to make suitable use of digital technologies, even if it was part of their initial training or if they feel confident in its use. In the PISA 2021 report [27], it was indicated that there is evidence that younger teachers still have some inexperience regarding the pedagogical uses that can be given to different technologies, while older teachers sometimes lack the technical knowledge to use technology to enhance learning.

Ref. [28] points out that "spreading the Internet or putting more computers in schools does not necessarily constitute major social changes" (p. 19). In fact, with the social evolution and the new requirements for education, as well as the constant innovation of technology, it is essential to critically reflect on the new ways of working of the teacher [29,30]. It always requires a solid articulation between pedagogy and technology, because "technology can amplify good teaching, but good technology cannot replace bad teaching" [31]. Moreover, the higher the level of teacher confidence in digital areas, the greater the capacity for effective integration of technologies in educational environments [32].

In Portugal, even in recent years, it has not been mandatory to have curricular units related to educational technologies, although there is reference in Portuguese legislation to the need for general educational training to include all relevant knowledge for a good teaching performance in the classroom [33]. If the investment on initial teacher training is still not a reality—it being up to each university to define its curriculum project and how it includes educational technologies in the preparation of future teachers—in continuing education, digital technologies training has been considered a priority, especially since 2007 [34]. This is the result of an awareness that the lack of preparation leads to a basic, conservative, or instrumental use of technologies in the classroom.

In a period of emergency remote education, results show teachers' awareness on the need for more as the vast majority of primary and secondary school teachers had no specific preparation for digital educational environments. In this sense, it is unsurprising that 79.4% of the participants in this study mentioned that they felt the need to do more training, since the pandemic forced the physical closure of Portuguese schools. Although 10% of the respondents were still not feeling prepared for teaching in digital environments, 90% of them stated that they are more prepared now. However, many of those teachers discussed weaknesses, threats, and future fears. Challenges related to technology, pedagogical changes, governmental guidelines, and individual needs of students implied that teachers felt unprepared:

> "Distance Learning requires training";
>
> "Very exhausting. Constant failures in the net, in the sound, in the image, etc.";
>
> "The distance does not allow the consolidation of the contents nor the real perception of the students' acquisition of learning. In-presence is essential".

As mentioned by [5], this situation promoted a "learning by doing" opportunity for teachers. Therefore, this is a moment in which the past and the future are envisaged, and new and assertive steps are taken towards change and innovation. The Portuguese Government's plan for school digital training, which had already started before the pandemic crisis, develops training based on the *DigCompEdu* framework, aiming to give them time to learn and gradually start to incorporate digital resources in teaching practices.

In addition, the preference for training programmes with a longer duration is also frequent, because it allows a better understanding of the effects over the teaching practices. Several pieces of research show that trainees begin to modify their practices, promoting more active and dynamic classes and using technologies as a means for the development of innovative, dynamic, and active learning strategies [35–37]. However, these authors consider these changes to be slow processes that need "a certain maturation to generate transformation" [36] (p. 222).

It is worth noting some responses, which stressed that those who already used digital technologies frequently managed to make the transition to emergency remote education with greater security:

> "As I am an ICT teacher, I already had the skills and used the E@D platform";
>
> "Because I previously worked with digital educational environments";
>
> "I was ready and willing that one day this could happen in a public school. We evolved 10 years in just 2 months".

### *4.2. Difficulties Faced by the Education Community*

Furthermore, some difficulties emerged regarding the students' conditions in line with [38,39]. Inequalities, socio-economic differences, and family conditions of the students; lack of assistance, support, or supervision by an adult or guardian; lack of equipment and Internet connection; lack of knowledge of tools and software (by students, teachers, and parents); or lack of information emerged as the biggest problems identified by the respondents:

> "The detachment, because most students don't even turn on the webcam and don't have the same pace of work. Students said they missed school";
>
> "Not feeling the presence of the student";
>
> "To see if the students were really attentive and to detect doubts, because they never manifest themselves online"
>
> "Students don't have all the resources they need!"

Regarding these major difficulties experienced by teachers during the pandemic crisis and the lockdown, in Portugal, the situation was similar to that of most European countries. As one of the OECD reports states, "this crisis has exposed the many inadequacies and inequities in our education systems—from access to the broadband and computers needed for online education, and the supportive environments needed to focus on learning, up to the misalignment between resources and needs" [10] (p. 4).

### *4.3. Transitions to Virtual Learning Environments*

Relational analysis is a kind of content analysis that allows us to identify four main concepts, which have different related categories (see Figure 1). The main conceptual categories are: remote teaching, regarding the rapid move of teaching to digital environments [1]; engagement and motivation, related with the idea that a student's acquisition of knowledge is mainly dependent on teachers, their presence, their planning, and their activities [40]; technological issues, because technology supports systems and digital networks in these new teaching ecosystems [9]; and personal issues as the teaching presence is a basic element in guiding the acquisition of information and the construction of knowledge [41].

These responses show that teachers have been overwhelmed with the task of providing remote learning opportunities to their students. As stated by one of the respondents, "the management of the different tasks, especially regarding the management of the different situations of students' access to the digital and the feedback to be provided to all students" increased stress situations, just as remarked by [42].

Many had to learn how to use new digital tools in a couple of days as well as rethinking their teaching methodologies. The pandemic exacerbated pre-existing problems, mainly because it forced rapid, "drastic" changes as referred to by the Portuguese Minister of Education himself [43] (p. 4). Furthermore, one study [44] stated that their participants used expressions such as "chaos, panic, worry, apprehension, insecurity, and, above all, uncertainty" (p. 547) to refer to a situation that dictated that education must be continued in exclusively digital environments. Just as one of the participants in this study stated, "not feeling the presence of the student" was the biggest problem for content consolidation and learning development [45], indicating that "as teachers were concerned about enabling students to access a substantial part of the school year's curriculum content from home, the

introduction of (new) learning content to stimulate students' cognitive activation emerged as another challenge" (p. 613).

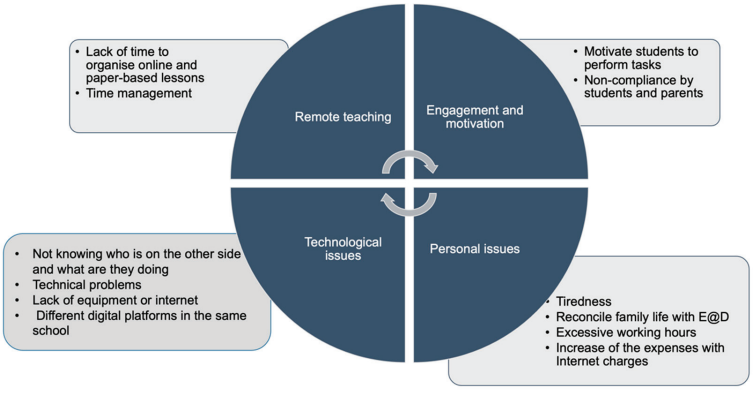



**Figure 1.** Relational analysis.

Ref. [43] stresses changes in the way students interact and a decrease in motivation for learning. Ref. [44] also reported the impersonal side of an education that does not allow physical contact among the whole school community, and that it is very difficult to manage the difficulties that students may have (either at school or even family level). This distancing is aggravated by the difficulty of interacting with students who keep their cameras turned off, as one of the participants mentions; this was also pointed out by [46] and by [47].

In fact, both the studies by [48,49], among others, state that school activities mediated only by digital mechanisms tend to be less fruitful than those that are interconnected with a physical experience, in schools. In recognizing this issue, it is important to realize that teachers acknowledged that this emergent teaching period can and should focus on the development of transferable skills, and on care for the students' socioemotional connection, whilst still trying to promote the development of knowledge.

All the responses related to the difficulties experienced depicted the same scenario: some schools were well equipped with the necessary infrastructure, devices, and staff, while others had been entirely unprepared to cope with the challenge of offering digital education. Equally, not all teachers and students had sufficient access to digital equipment or a reliable internet connection at home. At the same time, some teachers and students faced great difficulties to access and to deal with online educational resources. As new digital challenges emerged, teachers and students not only had to quickly acquire new knowledge and skills, but they also had to spend considerable time in front of screens. This reality potentiates issues such as those concerning the difficulty in combining family duties with professional duties, problems with time management, and excess work.

### *4.4. Limitations*

The study provided wide views on the transition process from face-to-face teaching to remote teaching due to the pandemic crisis. As the respondents are not a representative sample, the results cannot be generalizable.

Applying an online questionnaire using social media network can bring some similarity bias. Nevertheless, the use of online questionnaires has strengths and weaknesses that have been critically analysed in various studies, which highlighted their advantages [50]. Other studies have focused on comparisons with traditional 'pen and pencil' methodologies [51].

## 5. Conclusions

In this exploratory study, the results revealed that the context arising from the COVID-19 pandemic forced Portuguese teachers to modify their pedagogical work and the teaching-learning process, moving from face-to-face teaching to emergency remote teaching, mediated by digital technologies, and shows that what Portuguese teachers have felt, in dealing with this sudden transition, was like that of many other teachers in the world [3,43–45]. This process evoked several challenges: adaptation and flexibility in relation to a new way of teaching and learning, the use of digital technologies in education, how to motivate and involve students, and school institutional positions. The difficulties experienced in this rapid transition from face-to-face to digital environments, which are manifested in the answers given by several teachers surveyed in this study, reflect what [52] had already pointed out in his work before the pandemic began, namely the teachers' lack of digital knowledge and skills, the lack of technological equipment, and the students' own lack of digital skills.

The difficulties faced by teachers and the (lack of) ability to work with digital learning environments shows the importance of training in educational technologies, as also stated by [44]. However, it is not enough to attend teacher training in this area to enable these professionals to make suitable use of technologies. Teachers are an essential part of education and it is necessary to train them not only in face-to-face pedagogy, but also in digital learning pedagogy. Different skills should be trained towards student engagement, teacher performance, and ensuring academic integrity. Open models, hybrid models, and leverage personalization of curricula may well be the answer.

Furthermore, the relationship with students and how it was affected by physical distance, which several participants reported hindered motivation to continue learning, has also been seen in other work, such as in [45]. In fact, both the studies by [48,49], among others, state that school activities mediated only by digital mechanisms tend to be less fruitful than those interconnected with a physical experience in schools.

These difficulties demonstrate the need to think beyond the natural psychological issue, regarding the social isolation to which Portuguese young people, like so many other millions of students around the world, were subjected to during the period of almost total closure of the country, and how the transposition from face-to-face environments to digital environments that occurred in most schools [44] may have contributed to increasing this feeling of demotivation. In fact, this reiterates the importance of digital training for both teachers and students, so that in similar situations it is possible to move from emergency remote teaching to a true networked digital education [9].

The pandemic has emphasised the need to further invest in the development of digital skills for all citizens. Clearly, more professional development opportunities focused on digital technologies and digital literacy for teachers need to be created. While awareness of its importance has grown among teachers as well as policymakers, there remains work to be done to ensure that the problems brought to light are properly addressed—especially as issues preceding COVID-19 underpin the weaknesses of the education sector all over the world. If we have not managed to respond before, let this extreme pandemic situation and all the difficulties felt by the educational communities (represented in this article by teachers) allow us to give shape, through training and empowerment, to learning ecosystems powered by digital technology.

**Author Contributions:** All authors contributed to the design and implementation of the research, to the analysis of the results, and to the writing, review, and editing of the manuscript. All authors have read and agreed to the published version of the manuscript.

**Funding:** This paper was published with the support of the Portuguese Government, through the Strategic Funding of the RD Unit UIDB/03126/2020.

**Institutional Review Board Statement:** Ethical review and approval were waived for this study, due to the fact that the research project that this article is based on is in line with the Ethical Charter published by the Portuguese Society of Education Sciences and follows the guidelines linked to it.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References


1. Hodges, C.; Moore, S.; Lockee, B.; Torrey, T.; Bond, A. The Difference between Emergency Remote Teaching and Online Learning. 2020. Available online: https://bit.ly/3fX5bOp (accessed on 14 June 2021).
2. Ala-Mutka, K. Mapping Digital Competence: Towards a Conceptual Understanding. *JRC Tech. Notes* **2011**. [CrossRef]
3. Reimers, M.F.; Schleicher, A. *A Framework to Guide an Education Response to the COVID-19 Pandemic of 2020*; UNESCO: Paris, France, 2020.
4. Torres, L.M. A escola como entreposto cultural: O cultural e o simbólico no desenvolvimento democrático da escola. *Rev. Port. Educ.* **2018**, *21*, 59–81. [CrossRef]
5. Dias-Trindade, S.; Correia, J.D.; Henriques, S. O Ensino Remoto Emergencial na educação básica Brasileira e Portuguesa: A perspetiva dos docentes. *Rev. Tempos Espaços Educ.* **2020**, *13*, 1–23. [CrossRef]
6. Council of Ministres. Resolução do Conselho de Ministros n. 30/2020. Diário República, n. 123/2020, Série I, 2020, 6–32. Available online: https://dre.pt/home/-/dre/132133788/details/maximized (accessed on 14 June 2021).
7. WEF-World Economic Forum. *New Vision for Education: Unlocking the Potential of Technology*; World Economic Forum: Cologny, Geneva, Switzerland, 2015.
8. Ministry of Education. Roteiro: 8 Princípios Orientadores para a Implementação do Ensino a Distância (E@D) nas Escolas. 2020. Available online: https://bit.ly/3yNqhr2 (accessed on 14 June 2021).
9. Moreira, J.A.; Henriques, S.; Barros, D. Transitando de um ensino remoto emergencial para uma educação digital em rede, em tempos de pandemia. *Dialogia* **2020**, *34*, 351–364. [CrossRef]
10. OECD-Organization for Economic Cooperation and Development. Education Responses to COVID-19: Embracing Digital Learning and Online Collaboration. *OECD* **2020**. Available online: https://bit.ly/3vAqYSC (accessed on 14 June 2021).
11. Cabinet of the Deputy Secretary of State for Education and the Secretary of State for Education. Order n. 2053/2021, Diário República, n. 38/2021, Série II 2020, 109–110. Available online: https://www.gov.uk/government/ministers/secretary-of-state-for-education (accessed on 14 June 2021).
12. Briggs, C.; Makice, K. *Digital Fluency: Building Success in the Digital Age*; SociaLens: Bloomington, IN, USA, 2012.
13. Dias-Trindade, S.; Moreira, J.A. Assessment of high school teachers on their digital competences. *MAGIS Rev. Int. Investig. Em Educ.* **2020**, *13*, 1–21.
14. Gorozidis, G.; Papaioannou, A.G. Teachers' motivation to participate in training and to implement innovations. *Teach. Teach. Educ.* **2014**, *39*, 1–11. [CrossRef]
15. Schneider, D.; Harknett, K. What's to Like? Facebook as a tool for survey data collection. *Sociol. Methods Res.* **2019**, 1–33. [CrossRef]
16. Kohut, A.; Keeter, S.; Doherty, C.; Dimock, M.; Christian, L. Assessing the Representativeness of Public Opinion Surveys. The Pew Research Center for the People and the Press. 2012. Available online: https://www.pewresearch.org/politics/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/.
17. Selvi, A.F. *Qualitative Content Analysis*; Routledge: London, UK, 2019.
18. Bardin, L. *Análise de Conteúdo*; Edições 70: Coimbra, Portugal, 1995.
19. SPCE-Sociedade Portuguesa de Ciências da Educação. *Carta Ética*; SPCE: Lisboa, Portugal, 2020.
20. Mainardes, J.; Carvalho, I. Autodeclaração de princípios e de procedimentos éticos na pesquisa em Educação. In *ANPEd–Associação Nacional de Pós-Graduação e Pesquisa em Educação. Ética e Pesquisa em Educação*; Subsídios; ANPEd: Rio de Janeiro, Brasil, 2019; pp. 129–132.
21. Bassey, A.; Owan, V.J. Ethical issues in educational research, management and practice. In *Encyclopedia of Instructional Leadership, Policy, and Management*; Ololube, P.N., Nwivi, G.U., Eds.; Pearl Publishers International: Port Harcourt, Nigeria, 2019; pp. 1287–1301.
22. Creswell, J.W. *Projeto de Pesquisa: Métodos Qualitativo, Quantitativo e Misto*; Artmed: Porto Alegre, Brasil, 2007.
23. Beardsley, M.; Santos, P.; Hernández-Leo, D.; Michos, K. Ethics in educational technology research: Informing participants on data sharing risks. *Br. J. Educ. Technol.* **2019**, *50*, 1019–1034. [CrossRef]
24. Linder, C.; Farahbakhsh, S. Unfolding the Black Box of Questionable Research Practices: Where is the line between acceptable and unacceptable practices? *Bus. Ethics Q.* **2020**, *30*, 335–360. [CrossRef]
25. General Directorate of Education and Science Statistics. *Perfil Do Docente 2018/2019*; DGEEC: Lisboa, Portugal, 2019.
26. European Commission. *Survey of Schools: ICT in Education: Benchmarking Access, Use and Attitudes to Technology in Europe's Schools*; Publications Office of the European Union: Luxembourg, 2013.
27. *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*; OECD-Organization for Economic Cooperation and Development: Paris, France, 2019. [CrossRef]
28. Castells, M. A Sociedade em rede: Do conhecimento à política. In *A Sociedade em Rede. Do Conhecimento à Acção Política*; Castells, M., Cardoso, G., Eds.; Imprensa Nacional Casa da Moeda: Lisboa, Portugal, 2006; pp. 17–30.

29. Goeman, K.; Elen, J.; Pynoo, B.; van Braak, J. Time for action! ICT Integration in Formal Education: Key Findings from a Region-wide Follow-up Monitor. *TechTrends* **2015**, *59*, 40–50. [CrossRef]
30. Rodrigues, A.L. Digital technologies integration in teacher education: The active teacher training model. *J. e-Learn. Knowl. Soc.* **2020**, *16*, 24–33.
31. Students, Computers and Learning: Making the Connection. In *Students, Computers and Learning: Making the Connection*; OECD-Organization for Economic Cooperation and Development: Paris, France, 2015. [CrossRef]
32. Area-Moreira, M.; Hernández-Rivero, V.; Sosa-Alonso, J.-J. Models of educational integration of ICTs in the classroom. *Comunicar* **2016**, *XXIV*, 79–87. [CrossRef]
33. Ministry of Education and Science. Decreto-Lei n. 79/2014, Diário República, n. 92/2014, Série I 2014, 2819–2828. Available online: https://mon.gov.ua/eng (accessed on 14 June 2021).
34. Ricoy, M.C.; Couto, M.J.V.S. As TIC no ensino secundário na matemática em Portugal: A perspectiva dos professores. *Rev. Latinoam. Investig. Matemática Educ.* **2011**, *14*, 95–119.
35. Montez, R.; Aires, M.L.L. Colaboración online, formación del profesorado y TIC en el aula: Estudio de caso. *Teoría Edicación: Educ. Y Cult. Soc. Inf.* **2013**, *14*, 277–301.
36. Sampaio, P. Desenvolvimento profissional dos professores de Matemática: Uma experiência de formação em TIC. *Rev. Port. Educ.* **2016**, *29*, 209–232. [CrossRef]
37. Carlos, V.; Pombo, L.; Loureiro, M.J. Integração pedagógica das TIC no contexto de um Edulab reflexão e sistematização de princípios orientadores de boas práticas (projeto AGIRE). *Investig. Práticas* **2018**, *8*, 22–41.
38. Seabra, F.; Mouraz, A.; Abelha, M.; Henriques, S. Equidade e inclusão nas políticas de educação: Perspetivas a partir dos relatórios de Avaliação Externa de Escolas. *Indagatio Didact.* **2020**, *12*, 99–117. [CrossRef]
39. Ministry of Education. Orientações para o Trabalho das Equipas Multidisciplinares de Apoio à Educação Inclusiva na Modalidade E@D. 2020. Available online: https://bit.ly/2SA3gau (accessed on 26 July 2021).
40. Bates, A.W. Teaching in a Digital Era. 2019. Available online: https://bit.ly/3uxlDKr (accessed on 26 July 2021).
41. Garrison, D.; Anderson, T.; Archer, W. Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *Internet High. Educ.* **2020**, *2*, 87–105. [CrossRef]
42. Pascoal, R.M. Acceptance of Online Education in Portugal and in the World: Before and During Covid-19. *Kriativ-Tech* **2020**, *8*, 1–7. [CrossRef]
43. Di Pietro, G.; Biagi, F.; Costa, P.; Karpiński, Z.; Mazza, J. *The Likely Impact of COVID-19 on Education: Reflections Based on the Existing Literature and International Datasets*; EUR 30275 EN; Publications Office of the European Union: Luxembourg, 2020. [CrossRef]
44. Kidd, W.; Murray, J. The Covid-19 pandemic and its effects on teacher education in England: How teacher educators moved practicum learning online. *J. Teach. Educ.* **2020**, *43*, 542–558. [CrossRef]
45. König, J.; Jäger-Biela, D.; Glutsch, N. Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects among early career teachers in Germany. *Eur. J. Teach. Educ.* **2020**, *43*, 608–622. [CrossRef]
46. van der Spoel, I.; Noroozi, O.; Schuurink, E.; van Ginkel, S. Teachers' online teaching expectations and experiences during the Covid19-pandemic in the Netherlands. *Eur. J. Teach. Educ.* **2020**, *43*, 623–638. [CrossRef]
47. Flores, M.A.; Gago, M. Teacher education in times of COVID-19 pandemic in Portugal: National, institutional and pedagogical responses. *J. Educ. Teach.* **2020**, *46*, 507–516. [CrossRef]
48. Zhou, L.W.; Shanshan, Z.M.; Li, F. 'School's Out, But Class' On', The Largest Online Education in the World Today: Taking China's Practical Exploration During The COVID-19 Epidemic Prevention and Control As an Example. *Best Evid. Chin. Educ.* **2020**, *4*, 501–519. [CrossRef]
49. Almeida, B.O.; Alves, L. Letramento digital em tempos de COVID-19: Uma análise da educação no contexto atual. *Debates Educ.* **2020**, *12*, 1–18. [CrossRef]
50. Evans, J.R.; Mathur, A. The value of online surveys. *Internet Res.* **2005**, *15*, 195–219. [CrossRef]
51. Lonsdale, C.; Hodge, K.; Rose, E.A. Pixels vs. Paper: Comparing Online and Traditional Survey Methods in Sport Psychology. *J. Sport Exerc. Psychol.* **2006**, *28*, 100–108. [CrossRef]
52. Gonçalves, V. COVIDados a inovar e a reinventar o processo de ensino-aprendizagem com TIC. *Pedagog. Ação* **2020**, *13*, 43–53.

MDPI
St. Alban-Anlage 66
4052 Basel
Switzerland
Tel. +41 61 683 77 34
Fax +41 61 302 89 18
www.mdpi.com

*Education Sciences* Editorial Office
E-mail: education@mdpi.com
www.mdpi.com/journal/education

Academic Open
Access Publishing

www.mdpi.com

ISBN 978-3-0365-8007-4