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Review

Use of Digital Resources in Higher Education during COVID-19: A Literature Review

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Abstract: The sudden transition from face-to-face education to remote education under the international-level restrictions imposed as a result of the COVID-19 pandemic—a transition made in the spirit of achieving and developing accessible education—involved the application of methodologically diverse resources and strategies. The objective of this article is to investigate the digital resources that have been applied in higher education institutions, paying special attention to the type and frequency of use of resources. A literature review was carried out on a total of 44 articles. The main results show that the primary resources applied in higher education institutions were videoconferencing tools, educational videos, and virtual platforms. Most higher education institutions made use of free and open access resources. Our primary conclusions posit our observation that the use of digital resources for teaching in an emergency context has not enabled reflection on their use. Such reflection would equip institutions for the optimization of these resources toward their efficient pedagogical application in teaching–learning processes.

Keywords: higher education; COVID-19; pandemics; digital resources; literature review

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1. Introduction

On 11 March 2020, the World Health Organization (WHO) declared the COVID-19 virus to be a pandemic [1]. The measures for the containment of the coronavirus involved international-level application of confinement policies, which made it possible to control the levels of contagion in the short term [2]. Such confinement policies mandated the closure of nonessential institutions, shops, premises, and other centers in which face-to-face activities were carried out. In the case of education, at the international level, 90.2% of the world's students [3] and 63 million primary and secondary teachers saw their educational conditions altered, with their right to education compromised [4]. At the university level specifically, at the beginning of April 2020, 185 countries closed their higher education (HE) institutions, affecting around 90% of the enrolled students [5].

Faced with the closure of educational institutions throughout the world, international organizations struggled to respond or make recommendations for the development of policies that could give continuity to the right to education immediately; this situation can be considered as a learning crisis derived from a health crisis [6]. The general response of institutions such as UNESCO, the United Nations, the Organization for Economic Cooperation and Development (OECD), and the World Bank (WB), among others, was unanimous: the continuation of the right to education would occur with support from information and communication technologies (ICT) and a formula of virtual education [7–10]. However, the different technological, pedagogical, resource-related, infrastructural, and training conditions of the most diverse geographies were not considered in this planning. Studies such as [11–13] revealed how there were intra-country, inter-country, regional, and international differences in capacities to continue the right to education, especially highlighting the repercussions for those countries defined as developing countries.

In the case of HE, we note that a report carried out by IESALC (International Institute for HE in Latin America and the Caribbean) of UNESCO stated that, of all the educational

levels, HE is the most technologically developed; HE experienced a process of technological revolution two decades ago, which—although not sufficiently heterogeneous—was marked by different levels of development [14]. Two years later, the same IESALC published another report highlighting that there were great limitations in adapting face-to-face teaching to online teaching in HE, which were marked by the lack of infrastructure or previous teaching methodologies that were based on hybrid learning models [15].

In a rapid and pioneering literature review carried out in July 2021, accounting for the main studies carried out on the impact of COVID-19 on HE, five broad themes of developing research were determined, as follows: (1) digital learning, (2) e-learning challenges, (3) digital transition to emergency virtual assessment (EVA), (4) psychological impact of COVID-19, and (5) creating collaborative cultures [16]. Another analytical study—developed using a literature review methodology—on the impact of technology on HE in times of COVID-19 had the aim of exploring the transition from traditional education to online distanced education. The authors highlighted an absence of research discussing the direct effect of the digital transformation on HE caused by the pandemic; its pros, cons, and future implications; and the specificity of the resources and methodologies used in the teaching adaptations [17].

Overnight, HE was subjected to a radical change in the natural habitat in which teaching was carried out—the classroom. Urgent remote education and the alteration of assessment modes [16] have had a different degree and depth of impact on HE institutions, faculties, and departments that previously carried out teaching methodologies based on blended learning or flipped classroom approaches [17]. At the beginning of the 2000s, university educational institutions began to show an interest in methodologies that combined traditional education (synchronous) with distance education (asynchronous) [18]. Authors such as those of [19,20] emphasize that such methodologies combine technological and pedagogical dualities, in which the emphasis is placed on the second element. Therefore, the duality of both elements and the adaptation of HE institutions to the development of technological materials and resources that are at the service of hybrid pedagogies involve processes of reflection and joint working in the classroom.

At a time when improvisation defined the adaptation of pedagogies and available technology to the requirements of the emergency situation, a literature review approach is valuable for highlighting the resources that were used or developed during COVID-19 in university institutions and how these were mediated with pedagogies and educational modalities. Such an approach can determine whether HE institutions have transformed or taken steps towards blended methodologies and whether they have developed a simulation of face-to-face education with the projection of deferred classes. We start from the working hypotheses that the implementation of technology does not necessarily have to entail a methodological change. Of special interest is the mapping of investigations that show which resources have held a majority in their uses and purposes. Such an approach goes beyond other literature reviews, which have approached the object of study that is proposed in the present investigation, but which have not endowed it with the characterizations that are principal to our question [21,22].

With these objectives, a rapid literature review was developed, in response to the WHO's urgent call for researchers to offer responses to the needs which have arisen from the current health crisis [23].

A systematic search of the literature published from 1 March 2020, to 10 April 2022, was carried out using two electronic databases that yielded 243 results. After applying our exclusion criteria, and carrying out different phases of research selection strategies, a total of 44 articles were selected to make up the corpus shaping the present study.

The content is divided into five sections. After Section 1—with a theoretical and introductory nature—Section 2 defines the research methodology. Next, Section 3 is dedicated to the results. Section 4 contains our discussion of the results. Finally, Section 5 presents our conclusions and proposes future routes of research for development.

2. Materials and Methods

The methodology implemented in the present research work is that of a literature review, and it is based on the steps developed for systematic review and meta-analysis protocols [24,25], which are made up of four main stages: search, selection, compilation, and extraction of data.

This study addresses the issue of the use and implementation of digital resources during the COVID-19 pandemic at the HE level. The process developed in this review methodology comprised five stages. The first stage was the elaboration of the research questions that reflect the objective of the study. The second stage consisted of compiling relevant documents enabling our study of the subject in the selected databases. In the third stage, the exclusion and inclusion criteria were defined and applied to the articles. The fourth stage consisted of applying our research questions to the articles to refine their selection. The fifth and final stage was the synthesis of the results through the process of extracting information and creating categories which could highlight the significant conclusions of the selected literature.

2.1. Research Questions

The present literature review aims to examine and summarize the resources and technologies utilized by HE during the COVID-19 pandemic—such uses were motivated by urgent online learning that was applied in early 2020. The research questions raised in this study are outlined in Table 1.

Table 1. Research questions.

Question	Objective
Q1. What digital resources have been applied in SE during the pandemic?	Its central objective is the underlying theme or lens on the use of digital educational resources during the pandemic
Q2. What digital resources have been the most used in SE during the pandemic in specific institutions?	Its objective is to map research based on cases applied in university institutions in which digital educational resources used during the pandemic are registered

2.2. Search Strategy

The research questions guided us in establishing keywords to sequence the search. From them, we derived the search string, which was composed of key words and phrases that served to locate potentially relevant documents using the search functions available in the selected sources. The search string was built from expression prototypes and Boolean operators that were tested and integrated in the two databases selected for the literature review—SCOPUS (accessed 9 March 2022) and Web of Science (WOS) (accessed 9 March 2022)—for bringing together scientific articles in journals indexed in the SJR (Scimago Journal Research), which indicates an international consensus about the decisive academic importance of a given study [26]. Subsequently, the search expression was carried out by including synonyms or alternative spellings of the terms, and other key words or phrases identified in the bibliographic records were obtained by entering the search expressions. These actions were performed repeatedly, resulting in the basic search string, which comprised the following key terms: (“digital resources” OR “digital educational resources” OR “educational technology” OR “educational platforms” OR “digital technologies”) AND (“higher education” OR “university” OR “tertiary education”) AND (“COVID-19” OR “coronavirus” OR “pandemic”).

The number of results, bringing together the combination of keywords, was 243 articles, of which the SCOPUS database contributed 146 articles and the WOS database contributed 97 articles.

2.3. Selection of Studies: Flow Chart of the Literature Search

Of the 243 results obtained in the databases, we developed a three-phase selection process. The first selection phase was based on reading the title and abstract, as well as the full text if necessary. During this phase, the inclusion and exclusion criteria set out in Table 2 were applied. Here, each of the authors of the present study investigated the results of one of the databases. Subsequently, in the second phase, both researchers reviewed and analyzed the database they did not analyze in the first phase, using the same criteria. Then, the results of each author for each database were compared with those previously attained by the research colleague. The third phase, that of discrimination, would be determined by collegial decision making on the results of both researchers.

Table 2. Inclusion and exclusion criteria.

Inclusion Criteria	Exclusion Criteria
Include only open access journals	Papers not related to education during the COVID-19 pandemic
Articles published since 1 March 2020	Articles that focus on non-tertiary and/or university educational levels
They include educational resources implemented in teaching in HE during COVID-19	Studies in languages other than German, English or Spanish

During the search process, 243 articles were extracted from the databases, as mentioned above. Subsequently, 43 duplicate articles were discarded, leaving 200 articles. Of this total, another 136 articles were eliminated because they did not meet the inclusion and exclusion criteria established in Table 2, leaving a total of 64 articles. Finally, after collegiate decision making, 44 articles were discarded, leaving another 44 articles for the study. The flowchart, in Figure 1, represents the article selection process that was applied, following the Preferred Reporting Items for Systematic Reviews (PRISMA) model [27].

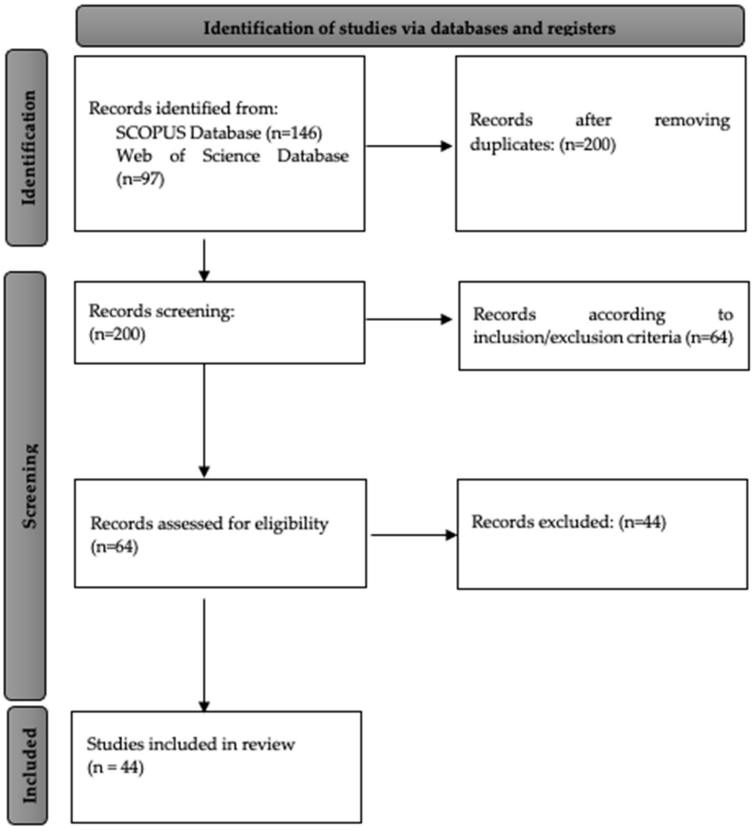

Figure 1. Flow chart of the article selection process. Adapted from [27].

3. Results

The 44 articles resulting from the methodological process presented in Section 2 were subjected to an exhaustive review using Microsoft Excel and the ATLAS.TI software. This allowed them to be classified according to six analytical categories, as follows:

- Theme;
- Knowledge area;
- Country of application of the study;
- Research focus;
- Digital resources used in HE;
- Methodologies implemented in HE.

3.1. Theme

Based on the analysis of the content of the articles, seven categories were established that identify the main trends in the object of study: the digital resources used in HE during the COVID-19 pandemic. These are represented in Figure 2.

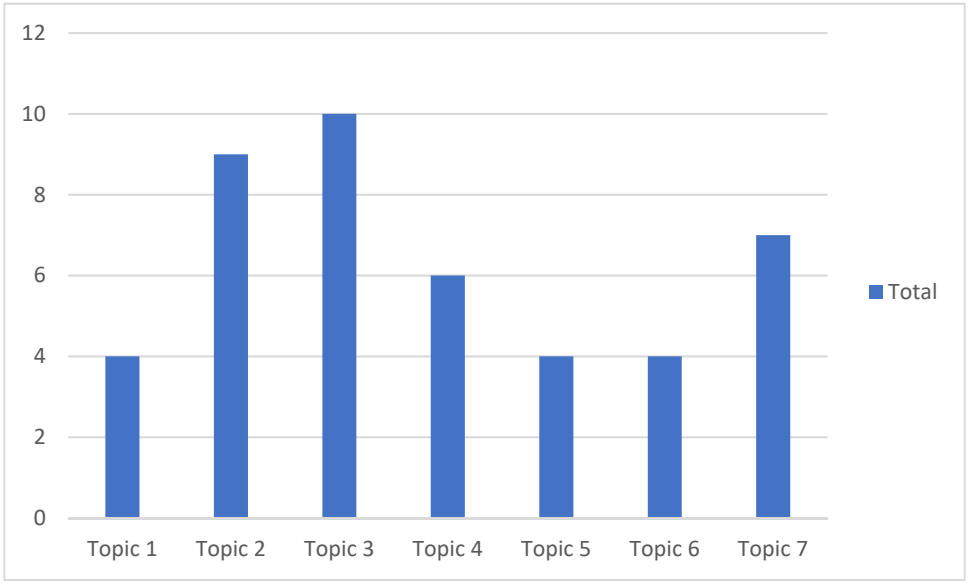

Figure 2. Themes (Ts).

Figure 2 shows that the most recurrent articles (T3), comprising 22.7% of the sample, are those that emphasize the implementation of digital technologies and resources, either from the perspective of adaptation of SE or for the management of a specific subject or module [28–37]. The second most frequent type of research (T2) is that which emphasizes the evaluation and comparison of digital supports and tools or learning formats with a digital component (synchronous vs. asynchronous; interactive vs. non-interactive asynchronous e-learning; and synchronous learning vs. combined e-learning or blended learning, etc.) [38–46]. In third place (T7), there are articles that identify digital resources used based on the perception and/or satisfaction of the educational community with the digital transformation of HE institutions and/or specific subjects for adaptation to the situation of the COVID-19 pandemic [47–53]. In fourth place (T4), a significant proportion of articles (13.6%) were concerned with evidencing the digital adaptation processes of the libraries of HE institutions to offering services to the educational community [54–59]. The fifth, sixth, and seventh place, with the same percentage representation (9.1%), is occupied by (T1) articles that identify or address digital resources through an evaluation of digital teaching competence or the application of digital training programs in the educational community in SE to face technological change in the COVID-19 pandemic [60–63]; (T5) articles that focus on the development of original software or digital learning resources to address

certain subjects or for the university itself during the COVID-19 period [64–67]; (T6) articles that address digital resources and emphasize the impact of certain specific methodologies or virtual learning environments, taking into account their technical–pedagogical component in the transition process to virtual learning during the COVID-19 pandemic [68–71].

3.2. Knowledge Area

We categorized the articles under study according to the area of knowledge in which the different investigations were carried out. For this, the fields of education and training proposed by the International Standard Classification of Education [72] were followed.

As can be seen from Figure 3, more than a quarter of the articles analyzed (26.1%) developed their research on the use of digital resources during the COVID-19 pandemic in careers in the education research sector [30,36,40,42,45,49,51,53,60,61,63,69]. This category was followed by those from the area of social sciences, journalism, and information (23.9%) [28,37,48,52,54,55,57–59,61,70], and 17.4% were within the research field of health and wellbeing [31,33,35,39,41,43,61,62]. A more discreet position is held by the studies carried out within the information and communication technologies [50,56,64,65] or services research fields [34,44,46,67], followed by those from engineering, industry, and construction [38,47,71], and natural sciences, mathematics, and statistics [29,32]. Finally, the areas of knowledge with residual representation (2.2%) were arts and humanities [66] and business administration and law [68].

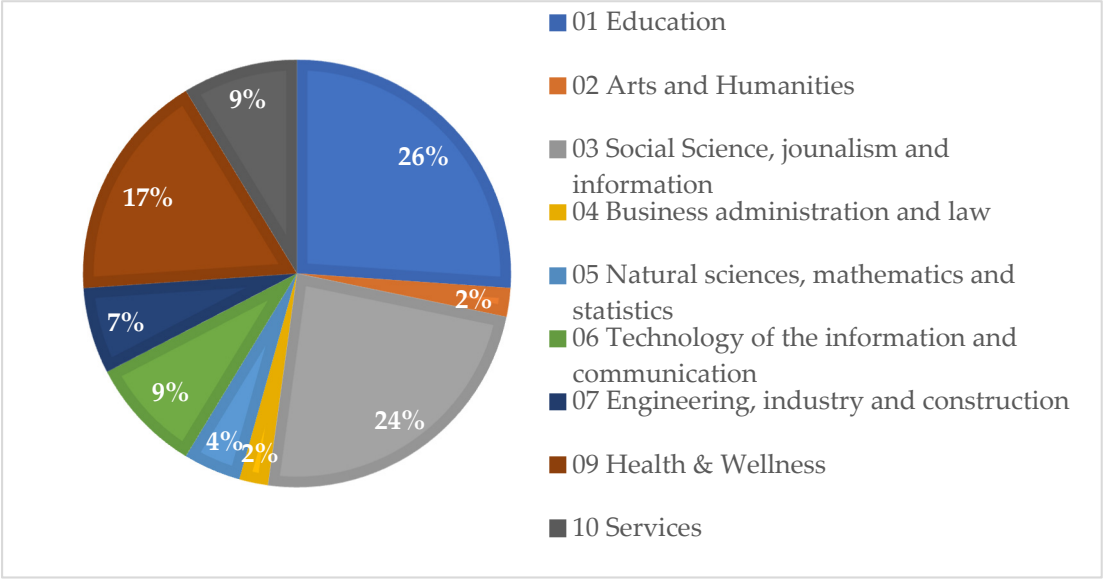

Figure 3. Classification of articles according to the area of knowledge.

3.3. Country of Application of the Study

The geographical locations the articles reviewed in this study can be seen in Figure 4.

As can be seen in Figure 4, the countries that are the most representative in the literature discussed here are Spain [34,41,48,51,56,61,63,64,69,71], the United Kingdom [29,52,57,68,70], and Germany [31,35,37,39], with percentages of 22.2%, 11.1%, and 8.9%, respectively. With smaller representation, countries such as South Africa [30,36,66], India [32,55], Turkey [50,54], and Peru [62,71] stand out, with percentages of 6.7% for the first and 4.4% for the rest. Studies originating in Spain comprise a fifth of the included studies. The results in this section show a significant dispersion, with numerous countries in which the object of study has been investigated in some of their HE institutions, as follows: Brazil [42], China [46], Costa Rica [49], Egypt [44], Lesotho [58], Mexico [65], Norway [38], Pakistan [45], Philippines [60], Poland [67], Sweden [39], United States [28], Uruguay [53], Zambia [43], and Zimbabwe [59]. This dispersion indicates the relevance of this issue and interest that it has aroused in the academic field. Finally, it should be noted that only two articles address

the object of study from an international perspective [40,71]. The first was performed in Spain and the second in Peru—categorized in Figure 4 as "global"—and these propose investigations that examine the impact of the object of study across the five continents.

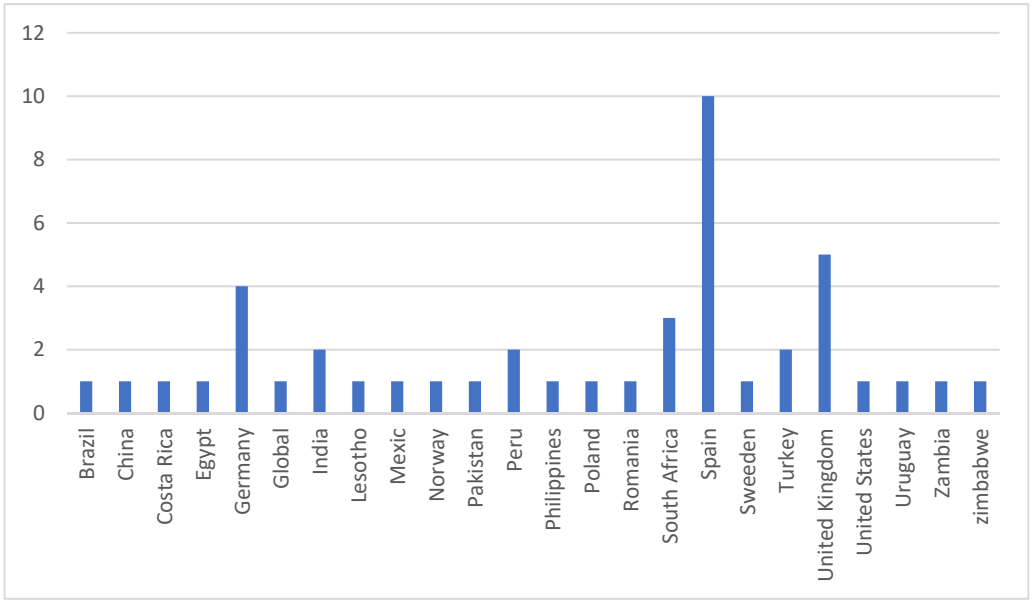

Figure 4. Classification of the articles according to the country in which the studies were performed.

3.4. Research Focus

The articles of the analyzed sample have been classified according to the research approach that, following [73], can be quantitative, qualitative, or mixed.

As can be seen in Figure 5, there is a significant proportion of articles that address the object of study from a quantitative approach, representing 50% of the studies [28,29,31,32,34,35,37,39,44,45,48–51,53,56,59,61,63,64,69,71]. Research taking a qualitative approach holds a more modest position, with a percentage of 31.8% [30,36,38,52,54,55,57,58,60,63,66–68,70]. Finally, mixed articles [39–43,46,47,65] represent a small percentage of the research carried out in this field (18.2%).

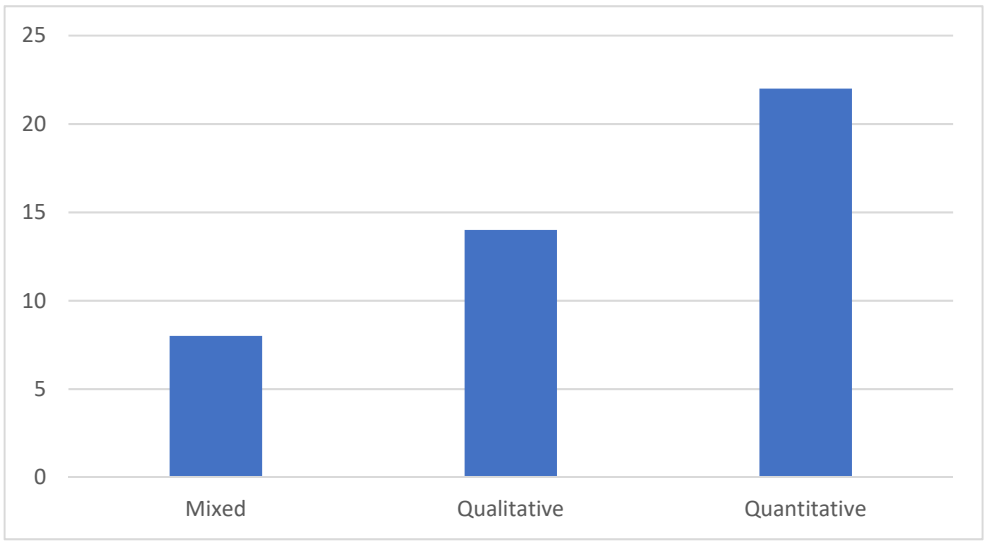

Figure 5. Research focus.

3.5. Digital Resources Used in HE

From a detailed reading of the articles, the digital resources used in HE institutions during the COVID-19 pandemic were identified. These have been ordered based on the classification of digital resources established by the authors, along with their main functionalities, and can be seen in Table 3.

Table 3. Digital resources used in HE and main functions applied.

DIMENSION	TYPE		SPECIFIC RESOURCE	MAIN FUNCTIONS APPLIED
SUPPORTS	Platforms	LMS	Moodle, Blackboard Collaborate, Microsoft teams, G-Suite (Google Classroom), Canvas, UBICUA, OLAT, ILIAS, Thuto,	Course/subject (virtual classroom) for monitoring activities, resources, and evaluation
			Articulate 360	Creation of materials in an intuitive and attractive way to integrate them into the virtual classroom
		Attractive integration of digital content	Thinglink	Interactive software to create engaging materials and content
			Libguides (libraries)	Selection of information resources organized by disciplines or themes that are published on the library's website and serve as an intermediary between librarians and users
		Of lessons and courses	Udemy, Khan Academy, MOOCS y SPOCs	Open online courses to improve the skills of students in specific areas, subjects, or specialties
	Digital language/format		html5, Css, javascript (Microcontenido y Longform)	Graphic design for the creation of web content
TOOLS	Video conference	Emission/ Interaction	Zoom Big Blue Button Adobe Connect MS Teams Cisco Webex Skype Google meet	Theoretical classes in synchronous mode that in most cases allow interaction between teachers and students
		Complementary tools	Tweedback	Incorporation in face-to-face or online conferences of feedback functions (polls, comment wall, chat, etc.)
	Presentation		Microsoft Power Point, iSpring Suite	Slides, quizzes, dialogue simulations, screencasts, video lectures, and other interactive learning materials
	Messenger service	Snapshot	Wechat, WhatsApp, Facebook Messenger, Pingo	Communication between students and students/teachers
		No Snapshot	emails	

Table 3. *Cont.*

DIMENSION	TYPE		SPECIFIC RESOURCE	MAIN FUNCTIONS APPLIED
	Interactive request response		Kahoot! Socrative y Mentimeter, Edpuzzle Poll Everywhere, Kahoot, FlipGrid, AnswerGarden, Jamboard, Slido y Socrative	Platforms that allow interaction for the execution of evaluable tasks, quizzes, among other activities
			Google forms, Slido	Forms for conducting surveys and questions about content, etc.
	Storage		Google Drive, Dropbox, Microsoft OneDrive	Platforms for the distribution of materials in a shared way, as well as the delivery of activities in all kinds of formats
	Collaboration		Padlet, Mural, Wiki	Creation of collaborative murals
	Support and/or adaptation	**Auditory**	Transcriptor hetah, AMPDA, Spreadthesign	Online applications that facilitate communication with people with hearing loss.
		Visual	Hetah Transcriptor, lector Knfb	Online transcribers of texts to braille
		Motor	Accessibility Scan	Allows the use of tablets and mobile phones for people with motor limitations
		Cognitive	ABLE, TecnoCom	Applications with activities to enhance the creativity of students with autism, among other special educational needs
	Social network		Twitter, Facebook, Instagram, Google+, Pinterest, LinkedIn	Fast, interactive communication and content sharing
SERVICES (PROVIDERS)	**Access to digital documents**		Sage Journals, Proquest Central, Jstor Books, e-Book Academic Collection	Repositories or publishers with access to scientific publications
	Access and identity		OpenAthens	Remote access via identification to scientific content
	Search		Google Scholar	Scientific research metasearch engine
	Data migration		RemoteX	Data migration to the public cloud from a physical or virtual environment
DIGITAL UNITS	**Image (video)**	**Ad hoc**	Kaltura Snagit, Playposit, Camtasia, Windows Moviemaker, Microsoft PowerPoint, Gopro, Quik, Filmora, Powtoon, Movavi, Snagit, MySimpleshow, Shotcut, Screencast-O-Matic, HSP, Quick Time Player, VLC Player	Creation and editing of videos or content in mp4 or other formats
		No ad hoc	Youtube, Tedtalk, Panopto	Asynchronous communication software that allows you to share videos and/or broadcast videoconferences and webinars in real time

Table 3. *Cont.*

DIMENSION	TYPE	SPECIFIC RESOURCE	MAIN FUNCTIONS APPLIED
Text	**Reading, creating and/or editing**	Notepad, Microsoft Office, Latex Adobe acrobat	Text composition systems
	Anti-plagiarism	Turnitin	Online system embedded in the virtual classroom/LMS platform for plagiarism detection
	Audio	Podcast [1]	Streaming content via voiceover

[1] In this case, no specific reference has been made to technology for the generation of an audio format, but we included it in this section due to the specific mention of its use in the analyzed sample.

As can be seen in Table 3, the digital resources that have been used in HE during the COVID-19 pandemic are numerous. In addition to basic digital units, which teachers resorted to offline more or less regularly prior to the pandemic, and in their transition to an online format for hybrid working during isolation policies, numerous media stood out to us. Among these, LMS platforms of HE institutions prevail; specific tools or software for different purposes (videoconferencing, presentation, messaging, response, storage, collaboration, social networks) and external services have been used for the provision and mass access to digital resources.

However, we believe that it is not enough to simply recognize and classify the digital resources used; it is important to identify which have been the most frequently used in support of teaching in HE institutions during the COVID-19 pandemic. This deeper exploration is important in establishing methodological patterns that help in developing a more profound and contextualized understanding of the use of said resources. The main identified tools used in HE were represented in Table 4:

Table 4. Relative frequencies of the use of digital resources.

FORMAT	TYPE OF RESOURCES	%
SUPPORT	LMS	40.9
	Integration Content	6.8
	Lessons and courses	9.1
	Format/Language	4.5
TOOLS	Video conference	40.9
	Presentation	13.6
	Messenger service	29.5
	Response	6.8
	Storage	9.1
	Collaboration	9.1
	Support/Adaptation	2.3
	Social Networks	20.5
DIGITAL UNITS	Video	40.9
	Audio	4.5
	Text	9.1
SERVICES	Access to documents	13.6
	Identity	2.3
	Search	2.3
	Migration	2.3

Thus, based on the review of the scientific literature, it can be established that—in the context of HE during the COVID-19 pandemic—the digital resources which have been used the most in support of teaching have been the following: videoconferencing tools [28,30,32,35,37–39,47,48,50,52,53,57,65,66,71], educational videos [25,35,39,40,46,50,55,

57,59,63,65–67,69,71]—whether created by the teaching staff themselves (ad hoc) or already existing (not ad hoc)—and LMS platforms of the HE institutions themselves [28,30,32,38,41, 43–45,47,52,55,57–59,61,65–67]. Regarding videoconferences, Zoom had a 66.7% majority for use within the sample. Regarding the creation of ad hoc videos, Screencast (11.1%) stands out among the applications. For non-ad hoc videos, YouTube has been one of the most-used websites (33.3%). Regarding LMS platforms, the use of Moodle (50%) stands out. Second, the tools [30,32,35,36,40,46,52,54,55,59,65,67,71] used for the exchange of emails (non-instant messaging) were present in 71.4% of the studies that alluded to the use of messaging. Regarding instant messaging, the use of WhatsApp Messenger stands out (42.9%). In third place, with a still-relevant representation (20.5%), the use of social networks is prominent [30,31,35,44,45,55,58,59,66], among which Facebook stands out (55.6 %).

3.6. Methodologies Implemented in HE

Although the methodological component was not the main objective of the present literature review, it is considered relevant to highlight the results that have integrated—in addition to the resources—a methodological component or the intention of the application of the localized resources. In this way, the concepts encoded as "live" were determined by the ATLAS.TI software, as shown in Figure 6.

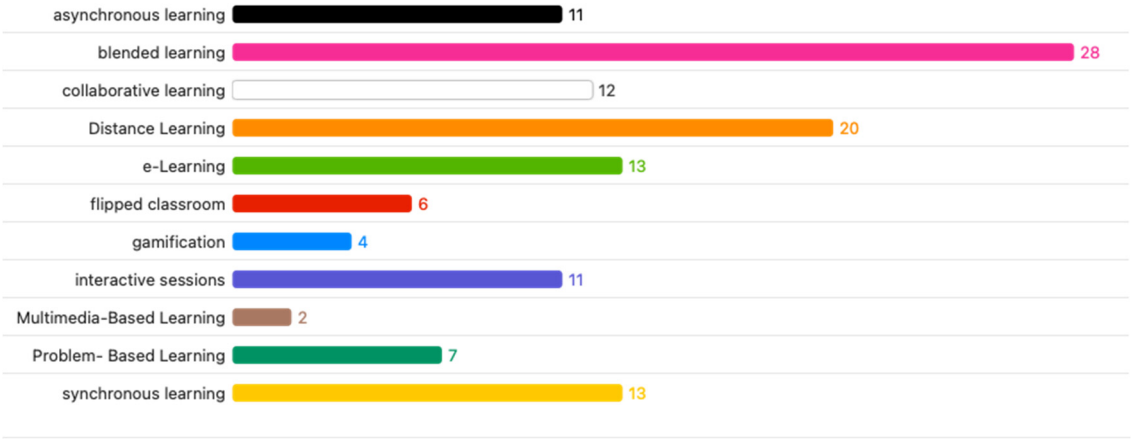

Figure 6. Representation of the localized methodologies implemented.

As can be seen from the word cloud derived from the content analysis of the texts in relation to the "live"-codified methodologies, the category "blended learning" appears in 63.6% of the articles included in this study. However, only a fifth of the articles [38–46] have truly described and worked on the "blended learning" methodology as a part of the teaching–learning process. Teaching–learning was developed in the HE institutions which were referenced in the analyzed studies. The second category that appears the most, comprising 45.5% of the studies, was "distance learning" [23,24,29, 38–43,47,49,52,59–61,66,67,69–71]. In 29.5% of the articles, the concepts "synchronous learning" [38–46,50,51,66,71], "asynchronous learning" [26,38,39,42,43,46,49,52,54,59,60, 66,70], and "e-learning" [22,27,29,39,42,43,46,49,52,54,59,60,66] were mentioned. As for more specific methodologies referred to in the articles, we found methodologies such as "collaborative learning" (27.3%) [28,34,40,42,47,49,51,61,62,64,69,71], "interactive sessions" (22.7%) [28,31,34,43,51,57,64,66,69,71], "problem-based learning" (15.9%) [31,43,45,57,64,67,71], "flipped classroom" (15.9%) [39,41,49,63,66,68,71], "gamification" (9.1%) [41,64,69,71], and "multimedia-based learning" (6.8%) [28,43,46].

4. Discussion

This section discusses the results obtained through our review of the included literature, the analysis of the articles, and the identification of gaps for future research. The

analysis of 44 articles identified a variety of themes addressed in relation to the use of digital resources in HE during the COVID-19 pandemic.

The growing interest in the digitization processes that HE institutions have experienced during the COVID-19 pandemic is evidenced in the large sample under analysis, as well as in the different thematic categorizations that have centrally (themes 3 and 6) or secondarily (themes 1, 2, 4, 5, and 7) addressed the object of study in this research. In them, the concern within the scientific community for studying the necessary digital transformation is evident, in the quantitative—in terms of the provision and use of technological resources—and qualitative—in terms of adequate provision of technological—pedagogical attention of the processes' transitions in HE being necessitated by the COVID-19 pandemic. This scholarly concern, to a certain extent, is corroborated by the considerable geographical dispersion of the sample, highlighting the international interest in the object of study. At the same time, studies carried out on primary and secondary education at an international level highlighted the differences and difficulties between developing and developed countries in continuing the right to education amidst the COVID-19 pandemic [13]. In HE institutions, there are fewer difficulties in the digitization, use, and access to ICT for pedagogical purposes, as cited in the reports developed by the UNESCO agency for HE [14,15]. This fact also contributed to the dispersion of the sample analyzed in this article. It should be noted that the fact that a fifth of the reviewed studies are located in Spain may be an indicator of a growing concern among the Spanish teaching and research community surrounding the integration of ICT for pedagogical purposes. This may be because Spain was classified at a medium level of digital competence for integrating ICT in its teaching, with a medium availability of resources and online platforms facilitating the development of quality education during COVID-19, according to an international comparative study [12].

In our study, there are only four articles [60–63] that address digital resources through an evaluation of the digital competence among teachers or through the application of COVID-19-mandated digital training programs for the HE educational community; however, because researchers may not have alluded to this investigation in their studies, a considerable number of articles may have been missed. The inclusion of such implicit findings in this review would reflect the reality of the concern raised and the ongoing development of a whole line of research in relation to the teachers and their training, pedagogical, administrative, and wellbeing needs during the pandemic [74–77].

Regarding the categorization by area of knowledge, studies in the education research field are the most represented in the reviewed literature. It seems that the education research field is the preponderant par excellence in this type of study, given that the latent issue in most of the articles was the concern surrounding digital resources in the E-A processes in HE during COVID-19. However, precisely because of this latent issue, the interest of the scientific community has also been strongly represented by eminently practical research fields, such as those in the health area, and to a lesser extent those in engineering or natural sciences (laboratories, etc.), in which the continuity of the E-L process in certain subjects or learning modules has represented a real challenge. It is these branches of knowledge that have a highly practical component and require laboratory access, which could explain the high interest in both fields for the didactic–pedagogical component and the resources implemented during the pandemic. It is important to highlight the impact of the research field of "social sciences, journalism, and information"—which has been strongly represented from the field of librarianship—because studies on the digital transformation of the libraries of HE institutions have constituted a whole specific thematic field (theme 4). The academic–scientific interest of this field is well-justified in that the guarantee of these services constitutes a solid and massive support base in facilitating access to knowledge for the educational community. This shows again the great scholarly concern for guaranteeing the continuity of E-A processes during the COVID-19 pandemic and, ultimately, for guaranteeing the right to education.

In relation to the categorization based on the research approach, most of the studies have been quantitative. This has been the approach par excellence in the articles of the

analyzed sample. Numerous variables can determine the choice of research approach, many of them impossible to encompass and/or assess. However, two structural elements can be provided that, perhaps, help to understand this decision-making process. The first is marked by the very object of study of a considerable number of investigations, which, among others, involves a comparison between learning modalities (theme 2) that makes quantitative approaches more suitable—for pretest–posttest and experimental group vs. control models, etc. Moreover, many articles based on the perceptions and/or satisfaction of the educational community (theme 7) tended to generalize the phenomenon studied, which is why they opted for quantitative or mixed approaches.

Secondly, the very reality of research during the COVID-19 pandemic, especially in the period of emergency and confinement, determined that researchers should opt for quantitative methodologies such as questionnaires and surveys, in which the possibilities of mass distribution and obtaining response by digital means is more feasible compared with the deep monitoring required by most qualitative methods. This imposed reality has limited the potentialities of qualitative approaches compared with quantitative ones.

Regarding the resources category, it can be pointed out—based on the results—that the digital technologies applied to deal with EE processes in HE during the COVID-19 pandemic have been numerous and varied. The situation of emergency conditioned, in most cases, the choice of certain digital resources, such as those already offered prior to the pandemic by the HE institutions themselves, making it difficult to innovate or integrate other resources with high pedagogical potential.

The main digital resources and formats implemented in educational teaching in HE institutions during the COVID-19 pandemic have been LMS platforms of the institutions themselves: the videoconference—primarily Zoom or Microsoft Teams; the creation and use of educational videos; the exchange of messages by the usual means (email) or through instant messaging applications—notably WhatsApp Messenger—combined with the use of social networks, mainly used for communication or, alternatively, as an LMS platform. In this sense, it can be noted that most of the applications or technological solutions used for the continuity of teaching are open educational resources (OER), that are available free of charge, or reusable educational resources (RER) that have been integrated into LMS platforms. It is these types of resources that have the most intuitive and simplified processes when they are implemented, since most university users are socialized in their use (social networks, Google applications, video calls, etc.), allowing increased accessibility [78,79].

At the same time, there is differential evidence provided by a specific line of study (theme 4) that suggests an investment effort by HE institutions in contracting services, mainly the access to digital collections in libraries, to offer a technological continuity solution to the educational community during the COVID-19 pandemic, and especially during the confinement period. OERs are advocated for and, at the time of the pandemic, various publishers, SE institutions, and digital platforms, etc., have formulated free licenses, making their resources available to the whole educational community [80]; however, there are various studies that show the need to invest in digital educational resources in SE [81,82].

Finally, the issues analyzed in relation to the methodologies applied or identified in the research studies are of special interest. For these, a certain level of critical analysis was applied. It is evident from the analysis of the resources and their relationships with the potential they have for developing hybrid methodological processes or blended learning approaches that—among the relevant studies included here—very few managed to truly develop it. The blended learning methodology involves the integration of resources within a methodological structure that is defined by educational moments marked by asynchrony and synchrony; such a methodology seeks to enhance performance, the integration of digital technologies, collaborative learning, and the optimization of E-A processes [83]. This approach involves the application of a blended methodology, a process of developing pedagogical reflection, skills, and resources that—in times marked by the emergence of a transition from face-to-face teaching to distance learning—was not possible. In this way, most of the studies cited blended learning methodologies, but few studies had a

balanced approach to the transition to virtual or remote education and the application of the aforementioned methodologies. According to various investigations, those HE institutions or their educational agents that had already developed blended learning methodologies prior to the COVID-19 pandemic are the institutions that applied the aforementioned methodology qualitatively [84,85].

In cases where a variety of specific methodologies—related to certain digital resources—have been applied without the involvement of a whole structural process or blended learning philosophy, such as collaborative learning, flipped teaching, gamification, or problem solving, less qualitative methodologies are practiced. The integrity between resource and methodology has been shown especially in those cases in which problem solving has been applied to disciplines with a high practical component and laboratory work. In cases of collaborative learning, a combination of resources, applications, and social networks have made it possible to work under the aforementioned methodology. In cases of flipped teaching, resources such as videos, digital documents, and other materials shared via storage applications and LMS platforms have served as a support for the application of a pedagogical model that provides students with access to the content to prepare in an appropriate way prior to a synchronous session. Curiously, gamification is a methodology that has not been applied with significant frequency. This was surprising since there is a multiplicity of internationally recognized platforms—such as Kahoot—which have been the subject of teaching and pedagogical innovation in the educational field for a decade [86]. An interesting point to note in the analysis of the educational methodologies developed in HE during COVID-19 is that, in general, most of the research has shown that educational institutions applied digital resources in the aim of simulating deferred or remote face-to-face education during confinement—this reduced their capacity for innovation. However, the impact is certain; as some research [14–17] points out, HE institutions are undergoing transformation after COVID-19, in which blended learning approaches—and the selection of resources that make them possible—are the most desirable methodologies for optimizing pedagogical processes [81].

5. Conclusions and Directions for Future Research

For more than two decades, the discourse on the digitization of education and the use of ICTs in EE processes have been a main theme for policy makers, institutions, educators, and students, etc., [87] as an adaptation to the societal and educational demands of the 21st century. In the case of HE institutions, this shift alludes to a capacity for adaptability and porosity in the face of convulsive events such as economic or political crises, as well as disruptions such as digitization or globalization. However, it was not until two years ago, with the advent of the COVID-19 pandemic, that a whole line of discourse was developed that states that the health crisis has had repercussions that have brought about a "before and after" in these institutions, which have faced a process of accelerated change [88]. In the 2022 Horizon Report for Teaching and Learning [89], it was pointed out that the transformations that have taken place in HE have come to stay, irreversibly transforming the identities of these institutions.

The state of shock to which the institutions and their agents were suddenly subjected, transitioning from face-to-face to remote or distanced education, has highlighted the different levels of digitization in educational institutions and the digital gaps between countries, within countries, between the different educational levels, and between educational centers [13]. In the field of pedagogical and educational research, researchers began to focus on the effects, needs, resources, methodologies, and implications of our emergency situation for the agents that make up educational institutions [90]. Having passed the first stage of publications and research categorized as "rapid scientific publication", after more than two years of the pandemic [91], research that is focused on themes of COVID-19 and education continue to be pertinent and relevant.

In this context, a first conclusive line is pointed out in relation to the methodology articulated in the present investigation, as a way of bringing together and highlighting the

volume of investigations that have been developed, where we have categorized them for informative purposes. The pandemic has been a crisis with globalized effects, and "good practices" can serve as a basis for policymakers and agents involved in the education sector.

The two following main research questions structured the present investigation: (Q1) What digital resources have been applied in the education sector during the pandemic? (Q2) What digital resources have been the most frequently used in the education sector during the pandemic in specific institutions? The application and use of platforms and social networks in the field of education and in the private lives (social networks) of educators and students have been highlighted. Our research indicates that the fact that these resources have been the most frequently used approaches can be explained by their compliance with the characteristics of OER and RER.

In general, educational innovation and the application of blended learning pedagogies have not been applied to a high degree, but the progress that has been made may have been motivated by the speed of the COVID-19-enforced transition from face-to-face education to distance education—as related to the use of resources such as videoconferencing, videos, and social networks, which have been implemented as a simulation of attendance.

Broadly speaking, studying the resources implemented during a health emergency or crisis that requires a transformation of the modalities in which classes are carried out has emphasized that the digitalization processes of HE, the training of its educational agents, and the availability of resources must be a priority in the policies developed by both national and international governments.

For future research, it would be insightful to develop works that bring together "good practices" in the HE space in relation to the teaching–learning models that were developed during the pandemic and post-pandemic. A literature review based on teaching skills and the use of digital resources, as well as qualitative studies based on interviews from grounded theory, could help us to delve into the use of digital resources and their relationships with hybrid methodologies, providing an understanding of their impacts on different spheres and agents in educational institutions. Other types of studies, such as the one developed by other authors on the perception of families about the teaching–learning processes of students during the pandemic [92], would be interesting to complement or triangulate the information.

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