publications

MDPI

Article

Open Educational Resources (OERs) at European Higher Education Institutions in the Field of Library and Information Science during COVID-19 Pandemic

Milijana Mićunović [1,*], Sabina Rako [2] and Kristina Feldvari [1]

[1] Faculty of Humanities and Social Sciences, J. J. Strossmayer University of Osijek, 31000 Osijek, Croatia
[2] University Computing Centre, University of Zagreb, Josipa Marohnića 5, 10000 Zagreb, Croatia
* Correspondence: mmicunov@ffos.hr

Abstract: The purpose of this study is to map the practices regarding open educational resources' (OERs) development and implementation at European higher education institutions (HEIs) in the field of library and information science (LIS) during the COVID-19 pandemic and to identify the challenges and obstacles to their full and optimal utilization, both during crisis situations and beyond. A systematic literature review and questionnaire-based survey yielded results from 56 European LIS schools/departments (n = 56). Statistical analysis was performed using the R programming language, and descriptive statistics were used to quantify the data sets. The results have shown that the COVID-19 pandemic served as an impetus for the adoption of OERs, particularly in the context of digital education (DE) and remote learning. However, there is still a lack of awareness of the many benefits and opportunities they provide to higher education, as evidenced by the fact than less than half LIS schools/departments used OERs. Certain issues were identified, such as the lack of institutional policies regarding OERs, inadequate peer-review of OERs, and, in most cases, the absence of monitoring and evaluation practices for OERs. The results and insights from this study can be used to improve all aspects of OERs' implementation and thus accelerate their adoption, both with regard to LIS schools/departments and other fields. Further research into the topic through interviews and focus groups should provide a deeper understanding of opportunities, challenges and practices surrounding the adoption of OERs in the field of LIS education.

Keywords: open educational resources; library and information sciences; higher education institutions; COVID-19; digital education

check for updates

Citation: Mićunović, M.; Rako, S.; Feldvari, K. Open Educational Resources (OERs) at European Higher Education Institutions in the Field of Library and Information Science during COVID-19 Pandemic. *Publications* **2023**, *11*, 38. https://doi.org/10.3390/publications11030038

Academic Editor: Lluís Anglada i de Ferrer

Received: 27 March 2023
Revised: 26 June 2023
Accepted: 12 July 2023
Published: 14 July 2023

Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction and Theoretical Background

This paper presents findings from a study that explored the adoption of open educational resources (OERs) in European Higher Education Institutions (HEIs) during the COVID-19 pandemic. The study provides insights into the practices and reasons for OER adoption, and aspects of OERs that need modification or improvement. Moreover, this paper focuses on the field of library and information science (LIS), providing a domain-specific perspective on the continuous growth of open education. This study is part of the research completed within the first intellectual output (IO1) of the Erasmus+ project, titled *Digital Education for Crisis Situations: Times when there is no alternative (DECriS)*.

The Erasmus+-funded project DECriS (2020-1-HR01-KA226-HE-094685) was undertaken by the Faculty of Humanities and Social Sciences, University of Osijek (Croatia), in collaboration with Stiftung Universität Hildesheim (Germany), Universitat de Barcelona (Spain), Universitet po bibliotekoznanie i informacionni tehnologii (Bulgaria), University Computing Centre, University of Zagreb (Croatia), University of Sarajevo (Bosnia and Herzegovina), University of Mostar (Bosnia and Herzegovina), Victoria University of Wellington (New Zealand), and St. Petersburg State University of Culture (Russia).

The project, which commenced in March 2021 and concluded in June 2023, was part of Key Action 2—cooperation for innovation and the exchange of good practices.

The context was the COVID-19 crisis, and the aim was to understand the challenges that this crisis posed for HEI infrastructure, program curricula, the teaching and learning process, and administration.

The primary objective of the project was to investigate how innovative digital practices regarding digital education (DE), new innovative curricula and educational methods, and OERs were implemented in HEIs in the field of LIS during the COVID-19 pandemic. Attention was also directed towards international cooperation and collaboration with the business sector.

The main goal was to examine how DE is organized, particularly in relation to OERs, and to investigate their novelty as it pertains to content, pedagogical issues, and use of advanced Information and Communication Technology (ICT). This could provide an opportunity to create a framework for proper adoption of OERs in general and during crisis situations in particular.

Other goals included:

- Raising awareness of the role and importance of OERs in higher education,
- Encouraging the development of higher education policies and strategies that support the use and development of OERs during crisis situations and in general,
- Identifying critical success factors regarding OER implementation, testing these factors via case studies, and implementing them in practice,
- Emphasizing the necessity for DE and OERs ongoing optimization according to the dynamics and changing nature of education in crisis situations,
- Encouraging the adoption of OERs in LIS subject areas in which they are largely overlooked,
- Gaining insight into different methods for enhancing opportunities to create high-quality OERs and increase their availability,
- Building the appropriate framework for apprenticeship during crisis situations, and
- Contributing to the future of higher education in crisis situations in general.

The project included six intellectual outputs (IOs):

1. IO1—Survey of the use and policy-making documents on OERs at European HEIs during the COVID-19 crisis. The aim was to investigate the strategies that HEIs adopted in relation to innovation objectives in making OERs better used during the crisis and otherwise.
2. IO2—Appraisal of digital education and quality perception by students, teachers, and trainers at the partner HEIs during the COVID-19 crisis. The aim was to gain insights about the attitudes of students and teachers/trainers towards DE and OERs, mainly during the COVID-19 crisis, compared to their pre-pandemic experiences.
3. IO3—A list of critical success factors and their typological classification for the evaluation of OERs. The aim was to prepare a list of critical success factors to assess the quality of existing OERs and to present a typological classification for the evaluation of OERs' quality.
4. IO4—Case study on how the critical success factors work in practice. The aim was to map the success factors to the practices at partner HEIs through case studies at each partner HEI.
5. IO5—Optimization of OERs. The aim was for the DECriS consortium to apply the success factors to the existing OERs from the EINFOSE project (http://einfose.ffos.hr, accessed on 27 May 2023) to improve them and test how the success factors could be applied in practice.
6. IO6—Apprenticeship framework for crisis situations. The aim was to explore how the HEIs organized apprenticeship and fieldwork during the crisis and how these could be improved in an online setting.

Further information on each IO and the project in general can be found on the project's webpage: https://decris.ffos.hr/, accessed on 27 May 2023 [1].

This research is centered around OERs as the second part of IO1′s focus (the first part being the assessment of organizational practices in DE) and, indirectly, around issues of open education and open educational practices (OEP).

The concept of openness in education has evolved over time, continuously adjusting to the educational context [2,3]. Currently, the term "open" in education is predominantly associated with technological advancements that have facilitated its current form of growth. Nevertheless, it is deeply connected to a social, cultural, and economic phenomenon that goes beyond institutional and national borders. The concept of openness in education is closely linked with open pedagogy, i.e., OEP. Open pedagogy, often known as OEP, is a concept closely tied to OERs and open education, open access, open science, open standards, open licensing, and open formats. In theory, it is connected to other pedagogical schools, such as constructivist pedagogy, various learning and teaching theories, as well as educational practices and structures. Constructed on values of autonomy and interdependence, democracy and participation, and freedom and responsibility, open pedagogy regards access as a central issue, and considers agency as a means to expand this access. For this reason, it is often described as an access-oriented and learner-driven pedagogy. Sometimes it is also referred to as "OER-Enabled Pedagogy" due to its explicit relationship with open textbooks and OERs [4]. According to the Cape Town Open Education Declaration [5], OERs contribute to making education more accessible, especially in regions with limited financial resources for educational materials. They also nurture a culture of learning, creation, sharing, and cooperation, which are essential elements in a knowledge-based society. OERs also encompass open technology that facilitates collaborative learning, flexible learning, and the introduction of innovative assessment methods and accreditation procedures. To expedite the adoption of OERs, the Paris OER Declaration [6] urged governments worldwide to publish publicly funded educational resources under open licenses.

The term "Open Educational Resources" (OER) was first introduced at UNESCO's Forum on Open Courseware in 2002, which also highlighted the Massachusetts Institute of Technology's (MIT) initiative to share educational resources publicly, i.e., MIT Open CourseWare. In its latest revision, UNESCO defines OER as:

> [. . .] learning, teaching, and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, permitting no-cost access, re-use, re-purposing, adaptation, and redistribution by others [7].

Wiley's framework, known as Rights of Openness (4Rs and 5Rs) [8,9], is a practical way to determine whether a learning and teaching resource qualifies as an OER. This framework describes a user's rights over the content; in other words, what a user should be able to achieve with the content for it to be deemed an OER. The 5Rs are: retain, reuse, revise, remix, and redistribute rights [10]. Creative Commons and other open licenses can assist copyright holders in applying the 5Rs.

To implement suitable open policies in higher education, various factors should be considered [11]. The Publications Office of the European Union developed a framework to aid higher education institutions (HEIs) in strategic decision-making concerning open education. This framework suggests a holistic approach with ten core dimensions: strategy, technology, leadership, quality, access, content, pedagogy, recognition, collaboration, and research, extending beyond OERs, MOOCs (Massive Open Online Courses), and Open Access (OA) [12]. Furthermore, the intergovernmental organization Commonwealth of Learning and UNESCO developed guidelines to encourage institutions to adopt OERs by outlining critical issues and suggestions for integrating OERs into higher education [13].

The creation, use, and re-use of OERs are intrinsically linked to open pedagogy and open teaching practices. Open educational practices are:

> [. . .] the practice and culture that draws upon open technologies and high-quality OERs to facilitate collaborative and flexible learning. This may involve student participation in online peer production communities within activities intended to support learning, or more broadly, any context where access to educational opportunities through freely available online content and services is the norm [14].

Previous research has indicated that only a small fraction of teachers at HEIs employ these practices. Common characteristics of teachers who utilize OEP include: balancing privacy and openness, developing digital literacies, valuing social learning, and challenging traditional teaching roles [14].

The demand for OERs significantly increased during the pandemic. Numerous organizations, educational institutions, and national ministries initiated programs to assist faculty and students in transitioning to online learning using OERs. A recent Commonwealth of Learning report, based on responses from 38 countries, indicates that OERs assisted students studying during the COVID-19 lockdowns (52%), and that OER usage increased by over 50% during the pandemic [15]. Following the global lockdown and the shift to emergency distance education, further research on the use of OER in higher education during pandemics is needed, particularly within the context of library and information science (LIS) systems.

Between 2018 and 2023, several significant bibliometric analyses of scientific literature on OERs have been conducted, aiming to reveal trends, research patterns, and topics in this research area [16–18]. Ref. [16] carried out a bibliometric analysis of literature on open educational resources from 2002 to 2019 and proposed the following recommendations based on their research: (1) to expand international cooperation; (2) to consider the impact of OER on developing countries; (3) to develop sustainable mechanisms of OER projects; (4) to improve the quality of OER; and (5) to promote teacher training on OERs. Ref. [17] mapped scientific publications on OEP in the Web of Science and Scopus databases that have been explored from 2007 to 2020. The findings from these studies indicate a need to focus on more inclusive open educational practices tailored for students with disabilities. A recent study, ref. [18], reinforces the results of a bibliometric analysis of scientific literature. This research summarizes the growth structure of OER from 2002 to 2020 and provides a concise background overview of the works related to OER, its challenges, and obstacles.

The following literature review will focus on studies pertaining to ten critical aspects of OERs identified in the literature. These aspects have been used to develop the theoretical framework and the questionnaire for this study. They are institutional and national incentives for developing and implementing OERs, institutional policy regarding OERs, OER repositories, searching and finding OERs, OER evaluation and peer-review, adopting, implementing, and using OERs, curation and management of OERs, software and OERs, promoting and sharing OERs, publishing and licensing OERs, and libraries and the adoption of OERs. The aspects mentioned are derived from a systematic review of the overall significance of OERs, both during the pandemic and more generally. The final paragraph of this chapter will focus on the issue of OERs in the context of the library and information science (LIS) field during the pandemic.

1.1. Institutional and National Incentives for Developing and Implementing OERs

Prior research has shown that cost savings for students, pedagogical benefits, and institutional support for the use of OERs are the primary drivers of OER adoption in higher education. Universities may offer faculty reductions in course load, assistance with curricular research, monetary incentives, or library support to locate and adopt OERs [19,20]. Another study conducted at North American universities has identified institutional incentives, specifically monetary incentives and recognition, as significant motivators [21].

In response to the significant disruption to education caused by COVID-19, affecting 1.57 billion learners in 191 countries, UNESCO issued a call to support learning and knowl-

edge sharing globally through OERs [22]. HEIs also reacted to the COVID-19 outbreak by providing examples of OER adoption during the pandemic [23–25].

Implementing OERs on an institutional or national scale presents challenges in economic sustainability. Based on literature reviews and expert judgments, ten sustainability models were identified and analyzed: public funding, internal funding, endowments, donations, OER networks, offering services to learners, relying on OER authors, community-based models, production of OERs on demand, sponsorship, and offering learning-related data to companies [26]. However, the recent pandemic necessitates research and evaluation of new models of sustainability in emergency scenarios.

1.2. Institutional Policy Regarding OERs

Numerous initiatives emphasize the importance of developing institutional OER policies. To facilitate their creation, UNESCO and the Commonwealth of Learning have established guidelines for the development of OER policies [27]. The benefits of institutional OER policies have been highlighted in several case studies, revealing a range of positive changes, mainly associated with increased OER awareness [28,29]. One conclusion drawn was that policy development is not simply a top-down decision-making process, but also a discussion that can be influenced and steered by all members of an institution [29].

Although various reports and studies detailing the outcomes of OER implementation during the COVID-19 pandemic have been published [23–25], the impact of OER policies during and after the pandemic has yet to be evaluated and reported.

1.3. OER Repositories

In 2015, a concise analysis of the global OER movement revealed that, while there are numerous repositories, most lack shared search terms and metadata. Furthermore, content is distributed in various formats, and the tools supporting reuse, curation, and remixing are insufficient, unfamiliar, and/or not necessarily open [30]. To define the scope of OER repositories and propose indicators for their assessment and reuse, an additional study was conducted. This study laid the groundwork for improving OER repositories and demonstrated that repositories dedicated solely to OERs led to better reuse and educational outcomes compared to hybrid ones [31]. Moreover, another study shed light on quality concepts and approaches related to OER repositories, provided an overview of definitions of quality for OERs, and offered examples of existing practices and initiatives to illustrate quality concepts and their application to academic practices [32]. During the COVID-19 pandemic, the significant role of OER repositories in aiding teachers with emergency remote digital teaching was emphasized. A recent study illustrated how open digital repositories facilitated teaching and research processes during the pandemic, outlining the role of the national library [33].

1.4. Searching and Finding OERs

The vast amount of resources available in OER repositories can make it difficult for users to find relevant, high-quality resources. Studies concerning the use, adoption, and implementation of OERs indicate that the most significant obstacle to a better user experience is the difficulty in finding needed and relevant resources, as well as the time spent on the search process [34–36]. Various issues contribute to this, such as a lack of appropriate metadata, interoperability and standards, problems with the usability of search tools and services, and insufficient user search skills [35,37–39].

The first problem was partially addressed with the creation of the Schema.org metadata framework, which is used by major search engines like Google [9]. For an OER to be found and widely (re)used, it must include three elements: the content itself, appropriate metadata, and documentation that illustrates the structure of the resource from both didactic and technical perspectives. Resources must be published on servers that adhere to open access standards and include Web 2.0 functionalities [34].

In order to find an OER that meets specific needs, the user also needs to possess good search skills and use various necessary search techniques. The solution to this second problem is the implementation of traditional (e.g., referatories, search engines specifically designed to search for OERs, etc.) and advanced (tagging, rating, commenting, recommendation systems, etc.) discovery solutions [9,34,40,41]. Additionally, numerous user manuals and guidelines explain search techniques and the most important general steps a user needs to consider when searching for any type of OERs [37–39].

1.5. OER Evaluation and Peer-Review

The evaluation of OER quality has been a topic of interest over the past two decades [42,43], as it relates to the adoption and usage of these resources and contributes to better retrieval and sharing of OERs [44]. Studies have argued that skepticism about OER quality was a significant barrier to use [45], and that the dynamic nature of OER results in a stronger requirement of trust between producers and users of OERs [46]. Many OER repositories lack an effective quality control mechanism [41], and there is evidence that the lack of quality control when using OERs has been problematic for both teachers and learners [40]. One suggestion is that teachers' training should include the creation of OERs and the evaluation of their accessibility and quality [47].

Computer approaches to automatic OER quality assessment are mostly related to a specific aspect of quality, such as calculating a "relevance indicator" [48]. Other approaches to OER's quality management process have been discussed in the literature. One is a four-field matrix developed by [49] that differentiates between decentralized versus centralized, and open versus closed procedures. The first approach in this matrix, peer-review, is a model in which specialists validate the quality of a resource [49,50]. The second approach is a collaborative one, in which a community validates the sustained quality of OERs [43]. Another approach involves using the brand or reputation of the institution to persuade the user that the materials on the website are of good quality [51]. The final approach allows individual users to decide about OER quality by using rankings, comments, social tags, quality scores, system recommendations, or learning analytics tools [40,41]. Various criteria and quality indicators for evaluating OERs and their repositories have been used, identified, and proposed in several studies [43,45,52]. Additionally, numerous evaluation models and frameworks (e.g., Learning Object Review Instrument—LORI, TIPS framework), sets of standards, guidelines (e.g., OER in higher education), and rubrics (e.g., Common Core—OER rubrics) have been developed to address the clear need for OER (repositories) quality assessment [13,53–55].

When considering the efficacy of OERs with regard to the quality of these resources and student achievements, research shows a positive correlation between student grades and the use of interactive educational resources. Students achieve the same or better learning outcomes using OERs, with significant financial savings [56–58]. Also, a study conducted by [59] concluded that traditional textbooks are expensive, often have outdated content, and that student efficiency is not lower in the absence of traditional textbooks. Most HEIs, according to [60], have recognized the need to share OERs among faculties with the aim of reducing the high costs of studying.

1.6. Adopting, Implementing and Using OERs

The implementation plan for OERs is a high-level administrative and operational strategy. It can adopt a top-down, bottom-up, or a mixed approach. For this reason, the implementation plan should always be executed with institutional support and cooperation [27].

During the COVID-19 pandemic, OERs continued to be widely used in higher education, affecting the quality of teaching and learning. For instance, OERs facilitate the customization, individualization, and personalization of content to suit a specific classroom and students' learning needs. Teachers can contextualize the content more conveniently, thereby making it more relatable and relevant to students and creating a more engaging online learning experience. They have increased freedom in course design and in tailor-

ing content to their teaching style. Ultimately, OERs have enhanced online teaching by serving as effective substitutes for in-person instruction, while also allowing teachers to extend their use beyond online teaching, adapting them to a variety of other teaching and learning contexts and environments [23,61,62]. However, numerous studies reveal that faculty members do not always comprehend what OERs are and what they include, indicating that awareness and understanding of the term are major issues related to their adoption, implementation, and use [19,36,63–66]. A cross-comparative analysis conducted in 2022 [42] provided new insights into the factors that influence OER adoption by faculty in nine countries, suggesting modifications to the original OER adoption pyramid.

The sustainability of adopting OER through institutional support [67,68], as well as the lack of discoverability and accessibility of OERs [14,69], are also among the most frequently mentioned barriers in the literature. According to [67], the problem lies in the fact that most OERs are not national and/or institutional curriculum redesigns, but individual project initiatives. Two other frequent obstacles are issues with copyright and licensing [63,70], and the time and effort needed to find and evaluate each OER [64,71].

During the COVID-19 outbreak, HEIs responded by providing examples of OER adoption, implementation, and various initiatives [21,23–25]. A number of studies focused on the implementation of OERs in courses of certain disciplines, such as in the field of medical and health sciences [72,73], education [74], and economics [75], among others.

1.7. Curation and Management of OERs

Curation and management are two other crucial aspects of OER utilization and sustainability. Tied to issues of infrastructure, digital devices, and software, these tasks are typically accomplished through OER repositories or online platforms and social networks [7,38]. The choice of storage and management model depends on specific contexts and factors such as requirements, copyright licenses, institutional and national policies, and existing OER initiatives [76]. Web 2.0 has had a significant impact on OER curation and management, providing many free, open, and flexible platforms as alternatives to OER repositories. There are various examples of platforms used for the curation of open educational content. One such example is AREA, a content curation platform, or a referatory, designed to empower teachers as authors and reviewers of educational material. Another alternative approach to OER management is a blended approach that includes the use of repositories, different online platforms (referatories), and management software [76,77].

1.8. Software and OERs

In terms of designing, developing, managing, and publishing OERs, it is generally free and libre open source software (F(L)OSS) that aligns most seamlessly with the idea of free and open access to educational resources and sharing knowledge. As pointed out by [78], OERs and F(L)OSS are complementary on two levels—F(L)OSS tools support OERs, and OER content is based on F(L)OSS principles such as collaboration, transparency, innovation, and creativity. Another important aspect of using F(L)OSS is its ability to help bridge the digital divide and reduce the costs of hardware and software used for OERs, particularly in developing countries [7]. There are numerous reasons for the OER movement to utilize F(L)OSS—from supporting the core idea of openness (open access, open data, open standards, open licensing) and contributing to the public good, through enabling cost-effectiveness and customization, to increasing transparency, security, and technological self-reliance [7,38,51].

1.9. Promoting and Sharing OERs

Ref. [79] distinguishes two primary categories of OER promotion—the "push" and "pull" categories. The "push" category of promotion typically involves using social media and social networks to advertise and publicize OERs. Within this category, communities of practice, particularly teachers and educators, should be engaged in promoting OERs and sharing their experiences with others in their community [39,80]. Specific actions of

promoting and sharing OERs include: identifying communities of practice (both formal and informal), understanding the motivations for using OERs, surveying the "audience", building teams (teachers, librarians, OER users, other faculty members, and other institutions), engaging with the community through public discussions about OERs, providing individual consultations, offering OER workshops, translating and localizing the content of OERs, sharing OERs through repositories, platforms, and networks, creating policy guidance on the promotion of OERs that serves both as a benchmark framework and a matrix for planning and implementing OERs, publishing about OERs, and encouraging faculty members, including students, to publish their work as OERs [13,39,81–84].

Publishing, as a significant action step in promoting and sharing OERs, is closely associated with licensing issues and is primarily carried out through repositories, referatories, or different web platforms. Although various open licenses are available, there is still a lack of awareness among academics regarding copyright issues, as well as a deficiency of copyright preparation in LIS programs [85]. Open licensing provides a more flexible, yet still structured legal framework that considers different copyright laws in different countries [13,38]. The most popular open license widely applied to publishing OERs is the Creative Commons (CC) license. It supports the concept of both OERs and open education in general [7,38,85–87]. A CC license has three layers of code: a standard legal code that ensures license recognition by lawyers and courts, a human-readable code that allows the average person to understand the license, and a machine-readable code written in a format that enables software, search engines, and other technologies to identify the work by its terms of use [38,86]. Before selecting a CC license, authors should consider the rights they want to grant their users. CC licenses support six different combinations, but not all are applicable to true OERs. Commonly, CC0, CC-BY, CC-BY-SA, CC-BY-NC, and CC-BY-NC-SA can be used to license OERs, while the combinations CC-BY-ND and CC-BY-NC-ND usually do not apply to true OERs [7,39].

1.10. (Academic) Libraries and Adoption of OERs

Librarians are typically the ones assisting teachers, educators, and other faculty members in licensing their work [85,88–90]. However, their role is not limited to this area, as they significantly contribute to the OER movement in many other ways. For instance, academic libraries can initiate OER projects and partner with other OER advocacy efforts to promote OERs [88,91,92]. Despite this, there are certain challenges that affect academic libraries in supporting the OER movement, such as a lack of consistent financial support, insufficient staff time (navigating schedules and deadlines), an absence of institutional drivers for the adoption of OERs, and a lack of knowledge and skills concerning licensing and copyright [90,93].

Being long-term advocates of the OER movement affects libraries not only in relation to the work librarians do, but also with regard to the collections libraries assemble [89]. Librarians work more closely with other faculty members, assisting them with course design, providing expertise in pedagogy and information literacy, helping educators find resources and utilize OERs, and assisting them in creating OERs [89,90,92–94]. As for library collections, they contain a larger number of OERs and open textbooks, which have a substantial economic impact by reducing costs for students and enhancing college affordability [89,93–95].

One prominent example of the impact libraries have on the OER movement is that of the Consortium of Academic and Research Libraries in Illinois (CARLI), which initiated OER projects, established an OER Task Force, created a certificate program in OER Librarianship, provided infrastructure, formulated OER policies, and led OER workshops [95].

1.11. OERs and LIS

The realm of OERs and open pedagogical practices in LIS education remains largely uncharted. Only a few studies have examined the role of LIS professionals in open education [96,97] and the impact of OERs and open pedagogy on LIS students [58,98].

Upon analyzing curricula and syllabi from undergraduate and postgraduate programs in the field of LIS, researchers discovered that despite the heightened awareness of open policies, most LIS schools, with the exception of Universitat de Barcelona, do not offer formal training in open education nor take specific actions to ensure capacity building concerning open access to knowledge [96]. This study emphasized the importance of creating curricula and OERs in openness to knowledge for LIS students, which includes addressing the issue of integrating openness into the curriculum and ensuring continuous professional development in formal and informal LIS education programs. Ref. [97] discusses the opportunities OERs present to LIS professionals, particularly academic librarians, who are viewed as major contributors to the open educational commons and vital partners to educators and students in their efforts to build an open and social learning community. As for LIS students, they have a high level of awareness of the concept of OERs, but still lack adequate information literacy skills needed for the effective use of OERs [98]. However, in terms of creating OERs and open textbooks, LIS students have shown considerable enthusiasm to contribute to the LIS discipline's OER record by creating an open textbook [58].

Regarding the LIS area and research related to OERs during the COVID-19 pandemic in particular, besides the obvious role of libraries in open education [99], only a few studies have been conducted in the last three years. Ref. [100] studied libraries and their adaptation, sharing, and modification of OERs to meet their local instructional goals and students' information literacy needs. Refs. [101,102] examined the use of OER in LIS courses and the perceptions of LIS faculty, along with the potential implications for both LIS programs and the open education community. The research indicated that teaching with OERs provides economic benefits for students and potentially to librarianship as a profession. The consistent increase in open education initiatives and the development of OER training for librarians highlight the need for future librarians to learn about OERs. This has the potential to contribute to the sustainability of the open education movement by preparing future generations to actively participate in the movement and its initiatives and projects [101,102].

With regard to the implementation of OERs in the LIS curriculum, several studies [98,101,102] offer tangible examples of OER adoption in LIS education. As for students, they exhibit interest in open education and open education movement, generally responding positively to open education courses. They typically utilize various types of OERs, ranging from YouTube videos, e-journals, and e-textbooks, to lecture notes, conference papers, project reports, and courseware from other universities. However, they acknowledge their insufficient information retrieval skills and often express a lack of time for finding relevant resources. In the LIS field, teachers and instructors are aware of OERs and reference them in their teaching, with about half incorporating some form of OERs into their classroom instruction. There are various methods to implement OERs into the curriculum. For example, students can practice cataloging OERs or they can create, remix, and adapt existing educational materials to enhance library instruction courses. Ref. [103] proposes a model for teaching and learning in the LIS field within an OER environment, highlighting benefits such as utility, cost-effectiveness, and convenience. Additional advantages include improved textbook quality, the use of multimedia, increased interactivity, easier access to core course materials for students, and engaging teachers and instructors in curriculum design via the development of customized OERs [104].

2. Materials and Methods

To fulfill the goal of this study and the objective of the Digital Education for Crisis Situations (DECriS) project, we initially carried out a systematic literature review between February and March 2021. The review focused on a critical approach to, and synthesis of, the body of knowledge on Digital Education (DE) and Open Educational Resources (OERs) presented in books, reports, and case studies on DE, OERs, and open education, along with reports on DE and OERs policies. This literature review helped establish a theoretical framework for the issues of DE and OERs and laid a solid theoretical foundation

for expanding knowledge on DE and OERs in the context of crisis situations, such as the COVID-19 pandemic. A solid theoretical foundation was necessary to create a comprehensive questionnaire encompassing all relevant questions concerning DE, OERs, and institutional support. This research was part of the Erasmus+ project DECriS (intellectual output 1, IO1), which aimed to create a framework for the appropriate adoption of OERs in general, and in crisis situations in particular.

2.1. Participants

Since our focus was on the field of Library and Information Science (LIS), and further research was conducted through interviews with teachers/educators and focus groups with students (as part of intellectual output 2 (IO2) of the DECriS project), the questionnaire was designed to be answered by heads/directors of LIS schools/departments in the European Union and project partner countries.

In total, 56 LIS schools/departments (n = 56) participated in the research, which together accounted for 305 study programs (undergraduate, graduate, and postgraduate combined), 1839 teachers/educators, and 25,978 students. Overall, 23 countries participated in the research, namely: Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Turkey, Ukraine, and the United Kingdom.

2.2. Material

To investigate the implementation and use of OERs in Higher Education Institutions (HEIs) in the field of LIS during the COVID-19 pandemic, we used an online survey. Following the literature and documentation review, we designed a questionnaire. The entire questionnaire consisted of three sets of questions (38 in total), addressing issues of:

- The implementation of DE during the COVID-19 pandemic,
- The implementation and modes of use of OERs during the COVID-19 pandemic,
- Institutional support provided to LIS schools/departments regarding both DE and OERs during the COVID-19 pandemic.

This study presents the results of the second part, which concerns the implementation and modes of use of OERs during the COVID-19 pandemic.

2.3. Research Questions

The research questions guiding the OER section of the study are as follows:

- What is the current situation regarding the implementation of OERs in the context of the COVID-19 pandemic, specifically in the field of LIS? This includes the issue of institutional and national incentives and policies regarding OERs.
- What are the primary reasons for not using OERs, and what factors would contribute to their future use?
- What are the main reasons for developing, adapting, or using OERs, and which factors contribute to their implementation in the curriculum?
- Which aspects of OERs have been successfully implemented, and which aspects need further development and improvement? The aspects examined include searching for and finding OERs, monitoring, evaluating and peer-reviewing OERs, curating and managing OERs, promoting and sharing OERs, publishing and licensing OERs, and software issues.
- What role do libraries play in developing, adapting, or using OERs in higher education in the field of LIS?
- What impact do OERs have on higher education in the field of LIS?

2.4. Procedure

The survey was designed to be completed by heads and directors of LIS schools or departments. An invitation to complete the survey was sent via email to 102 representatives of European LIS schools or departments. Participants were informed about the survey's

purpose, the data collection process, and were asked to provide their consent to participate in the study before filling out the questionnaire. Pretesting was conducted from 25 May to 31 May 2021. The questionnaire was active on LimeSurvey from 1 June to 1 September 2021 (The questionnaire can be found in Supplementary Materials). During this period, 67 representatives from LIS schools or departments began to complete it. The responses from 56 representatives who fully completed the questionnaire were included in further analysis, giving a response rate of 54.9%.

Convenience (or accidental) sampling was utilized. The statistical analysis was performed with R, and descriptive statistics were used to quantitatively describe the data sets.

2.5. Results

As this paper's focus is on the current state of implementation and usage of OERs, we've excluded results pertaining to issues of DE and institutional support. Instead, we are presenting findings relevant to the second research issue of the project, which pertains to the implementation and modes of use of OERs in HEIs in the field of LIS during the COVID-19 pandemic (specific issues addressed in the questions are presented in Table 1). Also, we are only presenting the survey results, not the initial literature and documentation review for creating the theoretical framework for the first intellectual output (IO1) of the DECriS project. For the majority of questions, participants could select answers from predefined options, but they also had the option to provide more detailed responses in open-ended questions. Responses to open-ended questions were analyzed using text analysis based on the frequency of term occurrence.

Table 1. Survey elements related to implementation and models of use of OERs during COVID-19 pandemic.

Division	Survey Content	Method
General information	Name of LIS school/department	Open-ended question
	Position	Open-ended question
	Country	Open-ended question
	Number of teachers	Numeric value
	Number of students	Numeric value
	Number of study programmes	Numeric value
	Types of study programmes	Selection
	Other study programmes	Open-ended question
	Availability of national, institutional or LIS OERs repositories during COVID-19	Yes/No question and Open-ended question
	Incentives at the institutional and national level for developing and implementing OERs	Multiple selection
OERs during COVID 19 pandemic	Usage of OERs during COVID-19 (The following are conditional questions:)	Yes/No question
	Number of courses implemented OERs during COVID-19	Numeric value
	Reasons for not using OERs during COVID-19	Open-ended question
	Institutional motivation and incentives to start using OERs	Open-ended question
	Teaching staff motivation and incentives to start using OERs	Yes/No question and Open-ended question
	Availability of alternatives to OERs	Multiple selection
	Ways of finding OERs during COVID-19 by teaching staff	Multiple selection
	Ways of developing/creating and/or adapting OERs by teaching staff	Yes/No question
	Availability of institutional OER policy	Multiple selection
	Reasons to develop, create, adapt and/or implement OERs during COVID-19	Multiple selection
	Ways of ensuring peer-review of OERs	Multiple selection
	Responsibility for the curation and management of OERs	Multiple selection and Open-ended question
	Software for creation, adoption and management of OERs	Single selection
	Ways of publishing OERs	Multiple selection
	Collaboration with academic library regarding OERs	Yes/No question
	Promoting and sharing OERs	Yes/No question
	Monitoring and evaluating the use of OERs	Multiple selection and Open-ended

3. Results

The following responses are related to the division "OERs during COVID 19 pandemic" (Table 1).

Figure 1 displays the responses to a series of questions addressing the availability of OER repositories. As can be seen, OERs are available in the institutional repositories of

45% of library and information science (LIS) schools/departments. Representatives from 29% of LIS schools/departments stated that the national repository contains OERs, but only 13% identified repository-specific OERs connected to LIS. Notably, 41% of institution representatives are unaware of the existence of LIS OER repositories, while 46% indicate there is no such repository.

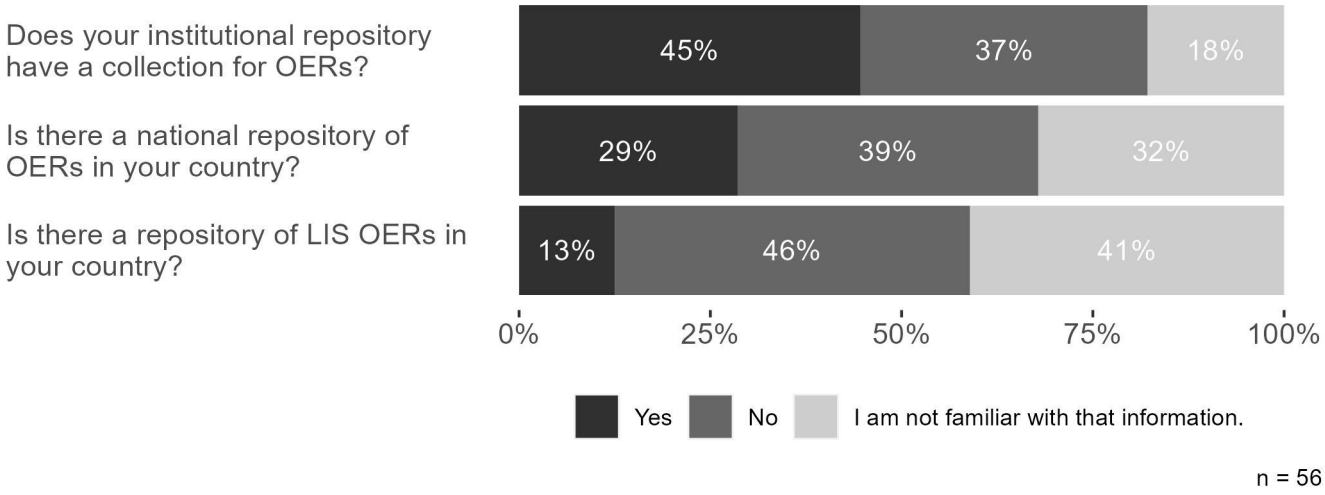

Figure 1. Declared availability of OERs repositories.

At 52% of institutions, the production and use of OERs are the result of the efforts of an engaged individual (Figure 2). Moreover, 32% of LIS school/department representatives are unaware of incentives on an institutional or national level that encourage OER production and publication. Only 14% of representatives are aware of specific projects or programs with public funding or governmental initiatives, but none are familiar with specific privately funded projects or programs.

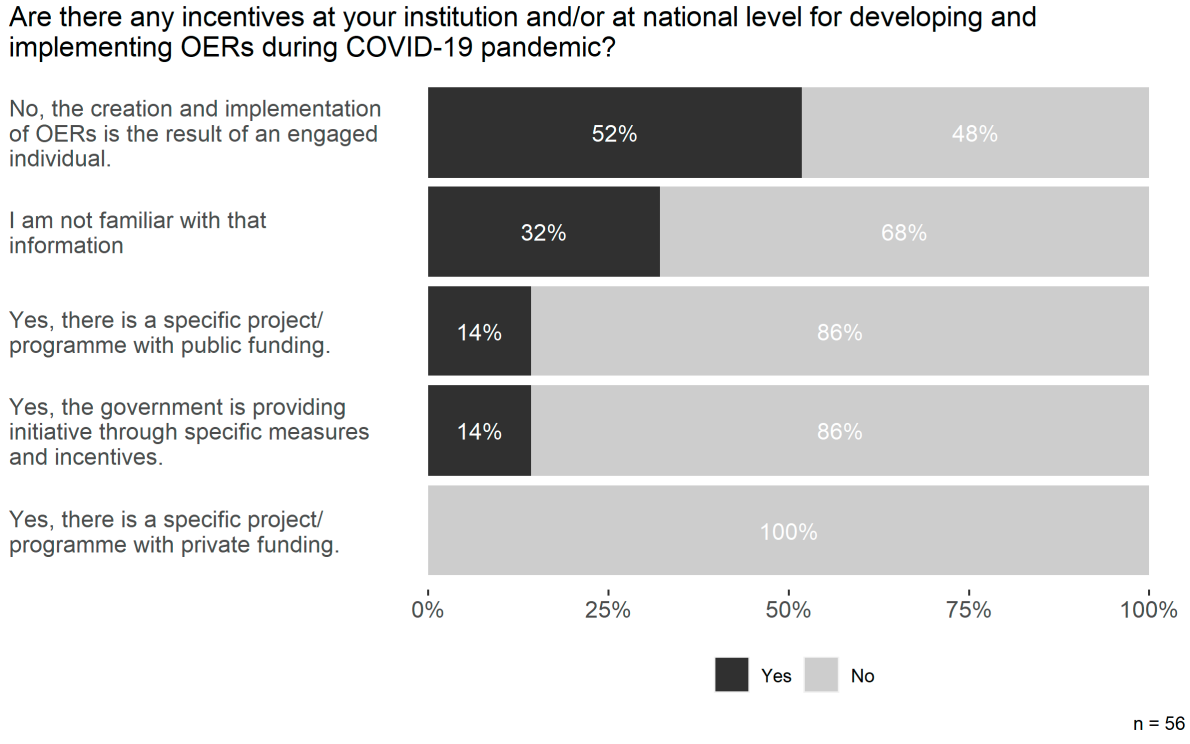

Figure 2. Incentives at institutional and national level for developing and implementing OERs.

During the COVID-19 pandemic, 26 institutions (out of 56) used OERs. Overall, 46% (n = 26) of LIS school/department representatives responded to the question, "In how many courses are OERs implemented?" The result showed that 6511 courses used OERs.

Representatives indicated unawareness of OERs' existence and unavailability of OER repositories as the top reasons for not using OERs. Additionally, a few representatives stated that there is no institutional pressure to use OERs and that there is a lack of technical resources, integration, coordination, and motivation.

Regarding institutional motivation and incentive to start using OERs, representatives recognized policies as the leading motivator, alongside other factors such as an easy-to-access platform, institutional recognition, students' requests, flexibility in course plans, LIS-specific platform, awareness, projects and funding possibilities, proofs of effectiveness, and OERs quality.

As for teachers' motivation and incentive to start using OERs, representatives identified several factors such as institutional decision, easy-to-access platform, availability of quality and domain-specific OERs, recognition, providing additional time and resources for OER production, and additional funding possibilities.

Overall, 20% of institutions employed alternatives to OERs (Figure 3). Typically, these educational materials are created specifically for the institution's use and are mostly not publicly accessible.

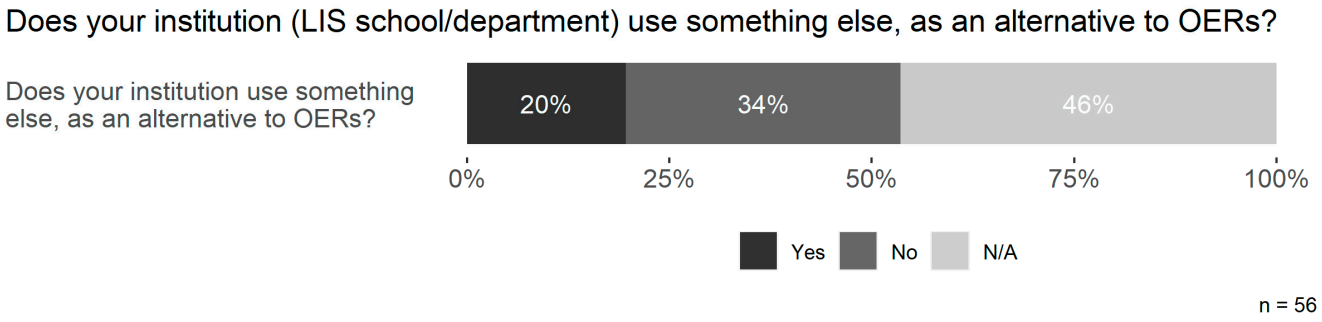

Figure 3. Alternatives to OERs.

Only 26 (out of 56) institutions used OERs during the COVID-19 pandemic (Figure 4). Among those institutions that used OERs, 54% (n = 14) of them modified and published existing teaching materials as OERs, and 50% (n = 13) of them used OERs developed at the national level. Full contextualization of OERs was performed by 35% (n = 9) of institutions.

Teachers and trainers at LIS schools/departments that used OERs during the COVID-19 pandemic located them mostly in OER repositories (62%) or directory sites (50%). A number of them (35%) find OERs through specialized OER search engines (Figure 5).

Representatives also mentioned other sources of Open Educational Resources (OERs) during the COVID-19 pandemic, such as contacts with colleagues or directly searching at other institutions.

The predominant method of developing or adopting OERs at LIS schools/departments that used OERs during the COVID-19 pandemic (n = 26) was independently (as a department, school, or faculty) (Figure 6). It is also noticeable that at 35% of institutions (n = 9) OERs were produced with the support of library staff.

Only seven institutions (out of the twenty-six using OERs during the pandemic) have an institutional policy regarding OERs. Among those institutions that have an institutional policy about OERs, the top reason for such a document is that OERs support adaptive and flexible teaching and learning (Figure 7).

The pre-publication review of OERs was implemented at 38% (n = 10) of institutions that adopted OERs during the COVID-19 epidemic. Meanwhile, an open or post-publication review was established at 35% (n = 9) of institutions (Figure 8).

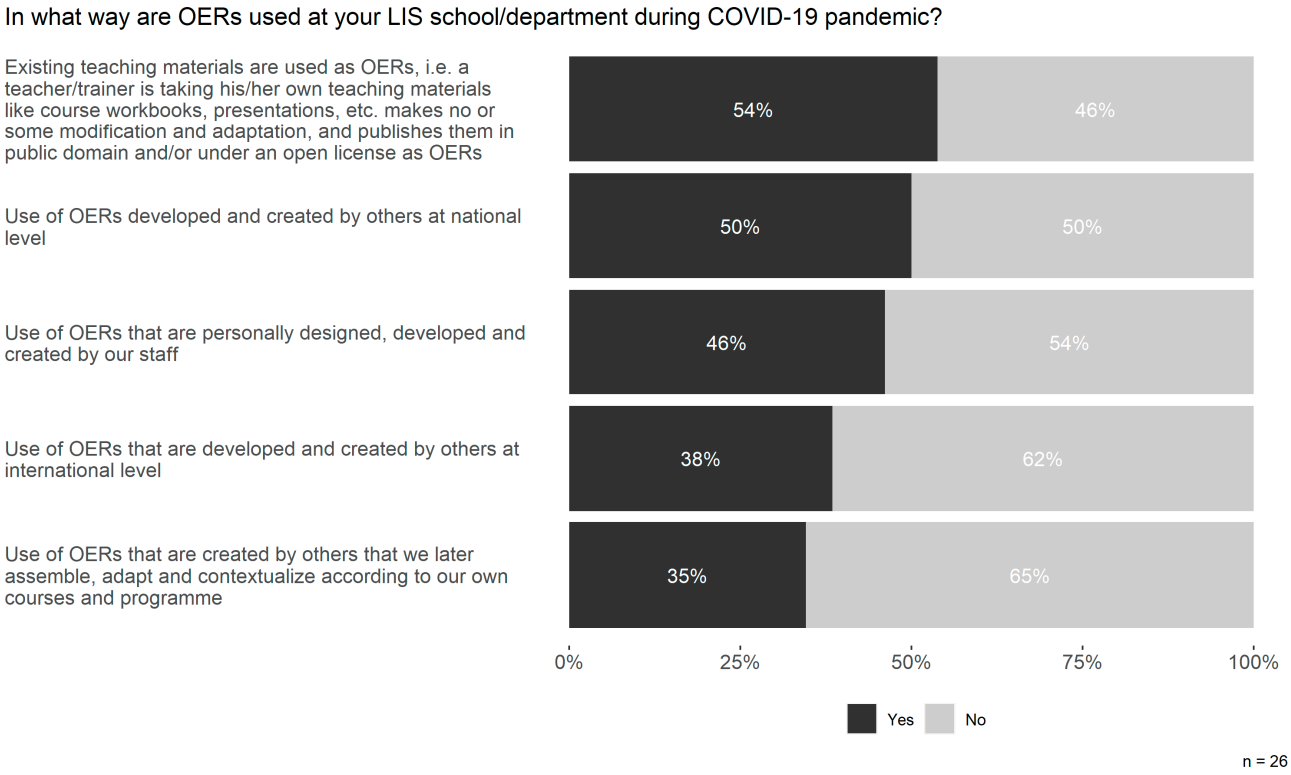

Figure 4. Usage of OERs at LIS schools/departments during COVID-19 pandemics.

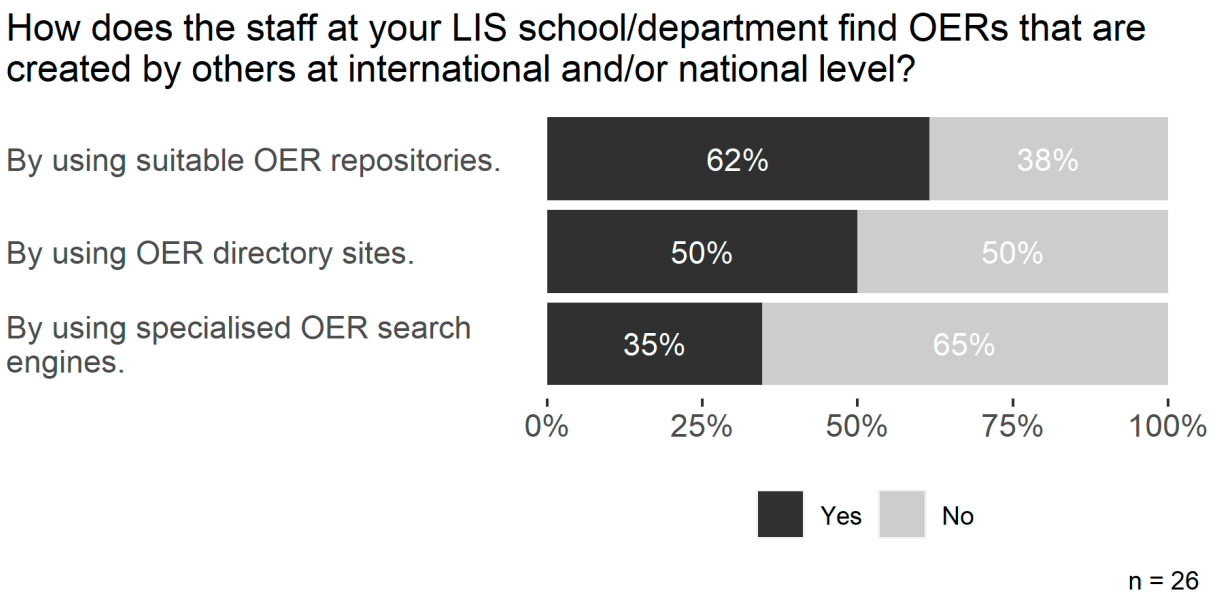

Figure 5. Sources of OERs during COVID-19 pandemic.

Teachers are primarily responsible for curating and managing the OERs they have generated (Figure 9). At 54% (n = 14) of institutions that adopted OERs during the COVID-19 pandemic, teachers are responsible for the OERs they created, while at 38% (n = 10) of institutions, curation of OERs is also provided by the academic library.

Free and open-source software was used at 65% (n = 17) of institutions that adopted OERs during the COVID-19 pandemic, followed by proprietary software used at 46% (n = 12) of institutions (Figure 10).

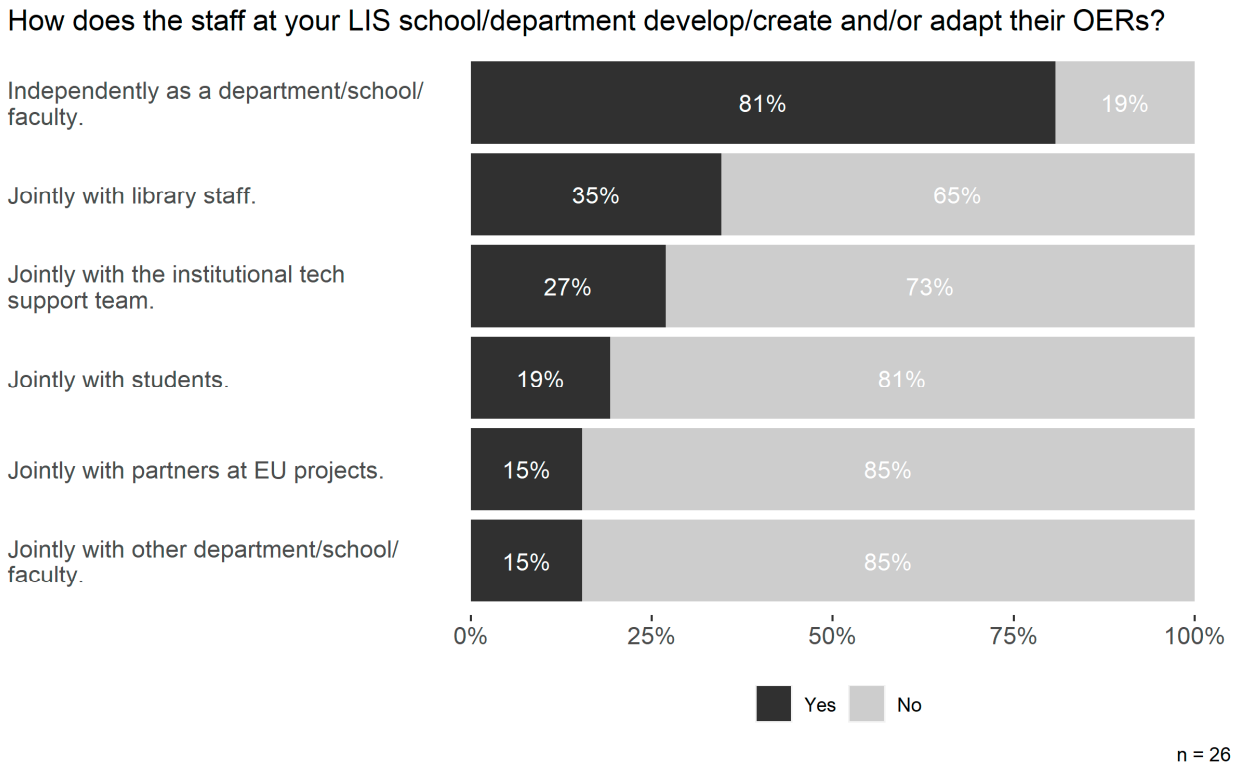

Figure 6. Development and adoption of OERs.

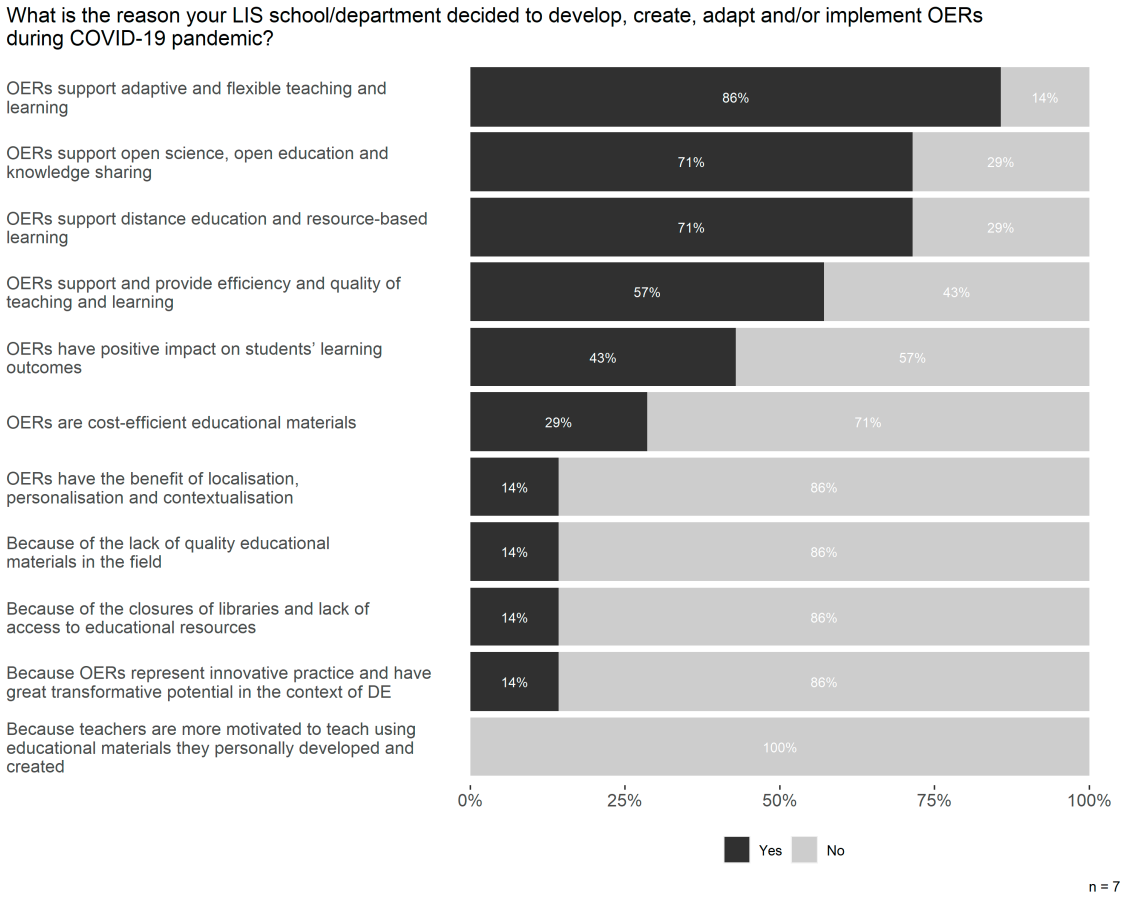

Figure 7. Reasons for OER production during COVID-19 pandemic.

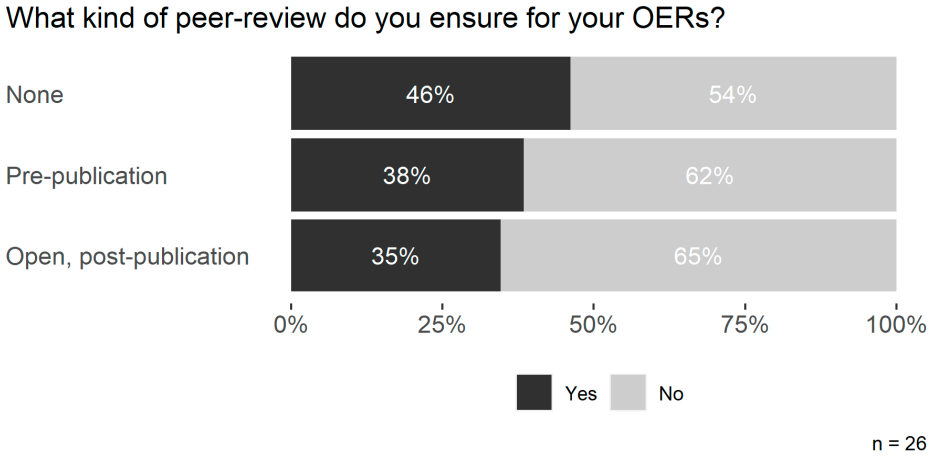

Figure 8. Peer-review process of OERs during COVID-19 pandemic.

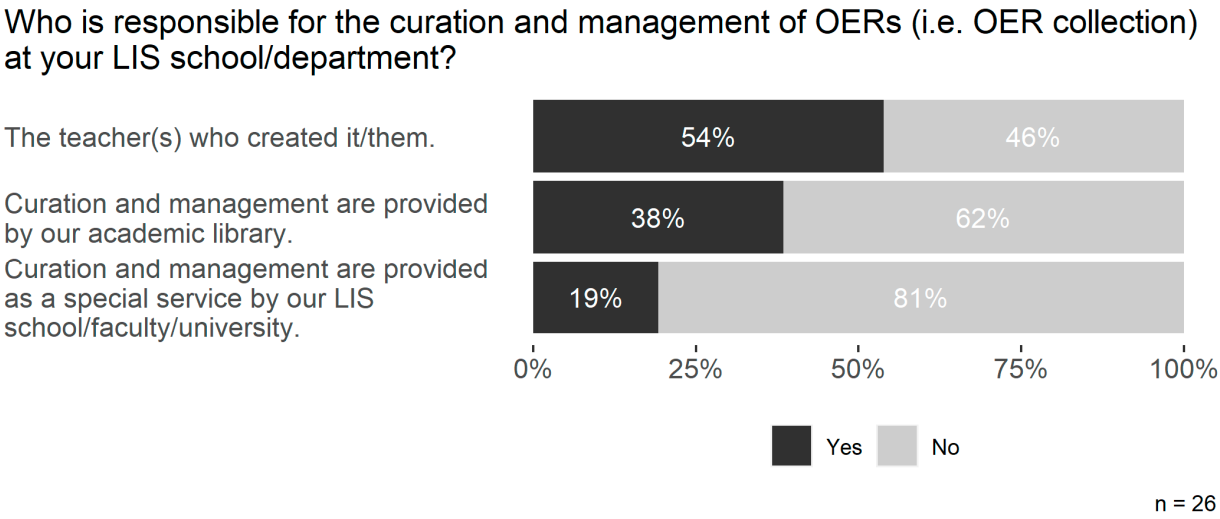

Figure 9. Responsibility for the curation and management of OERs.

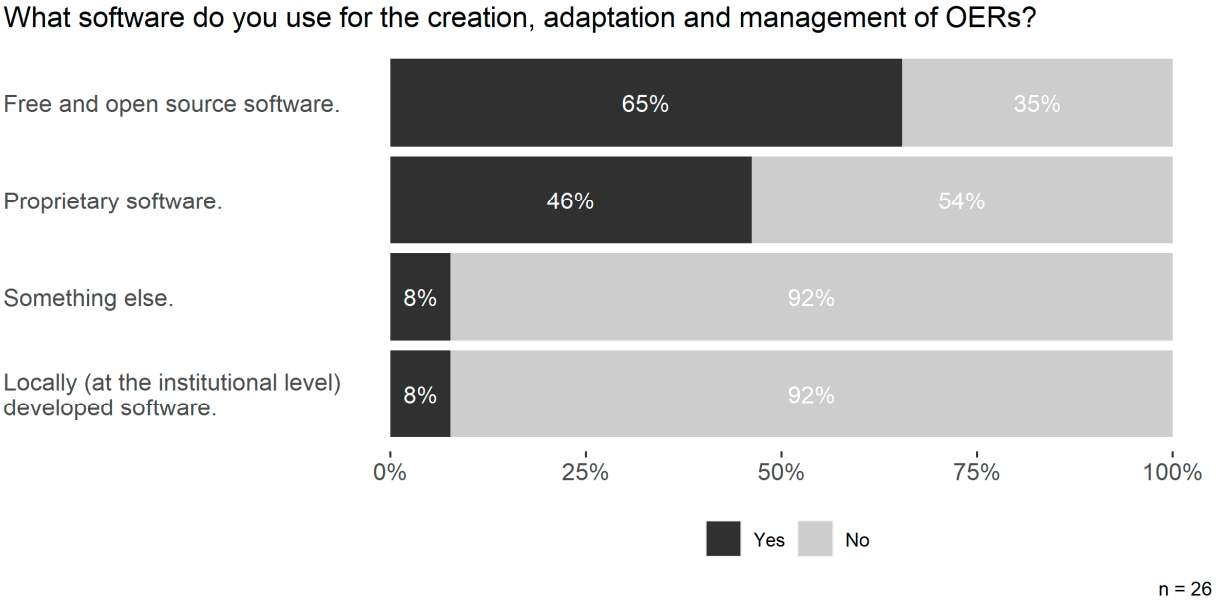

Figure 10. Types of software used during OER production.

Among the institutions that adopted OERs during the COVID-19 pandemic (n = 26), 46% (n = 12) of institutions published their OERs under open licenses, 39% (n = 10) used some other available licenses, and 15% (n = 4) published their OERs as a part of the public domain (Figure 11).

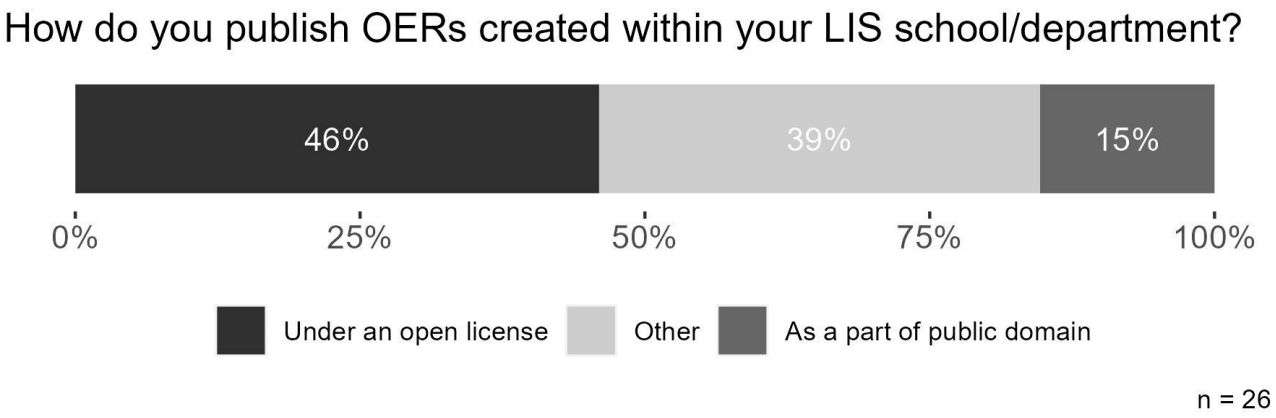

Figure 11. License used for OERs publication during COVID-19 pandemic.

In most institutions that used OERs during the COVID-19 pandemic (n = 26), 73% (n = 19) collaborated with an academic library to use library assets in the creation of OERs (Figure 12).

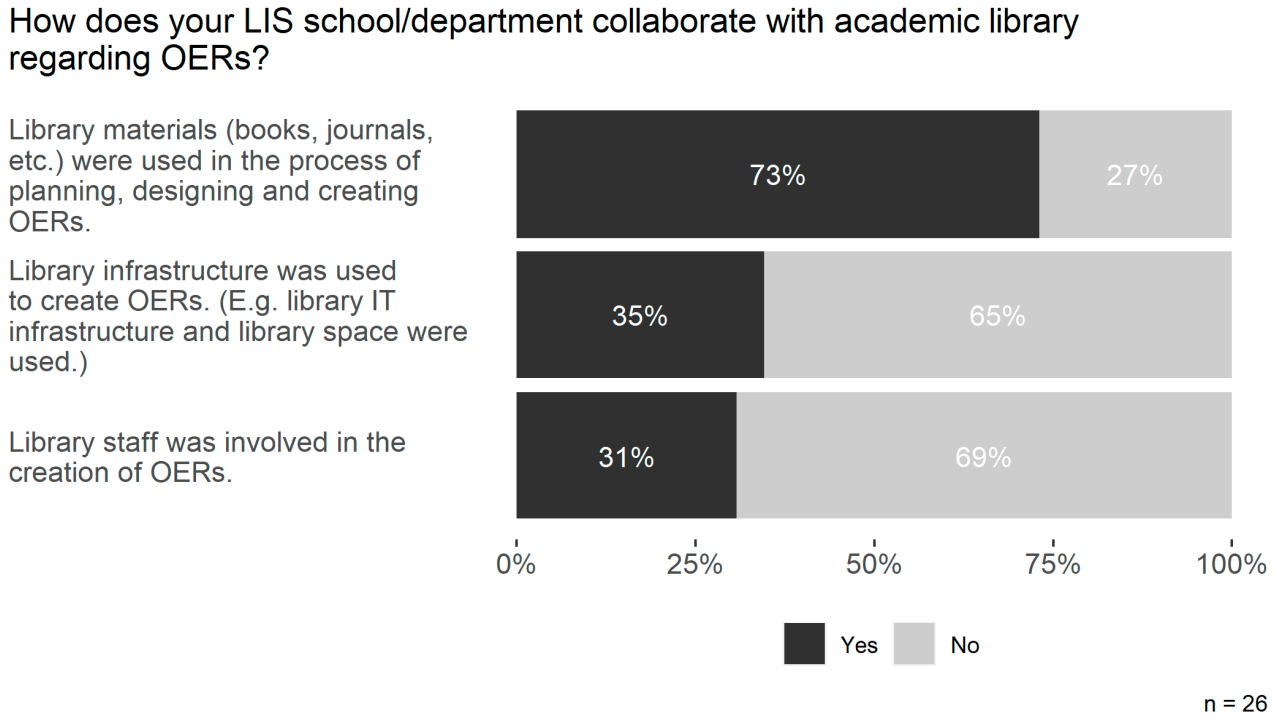

Figure 12. Collaboration with academic library regarding OERs during COVID-19 pandemic.

Half of the institutions that used OERs during the COVID-19 pandemic (n = 26) promoted and disseminated OERs, but only 15% (n = 4) monitored and assessed OER use (Figure 13).

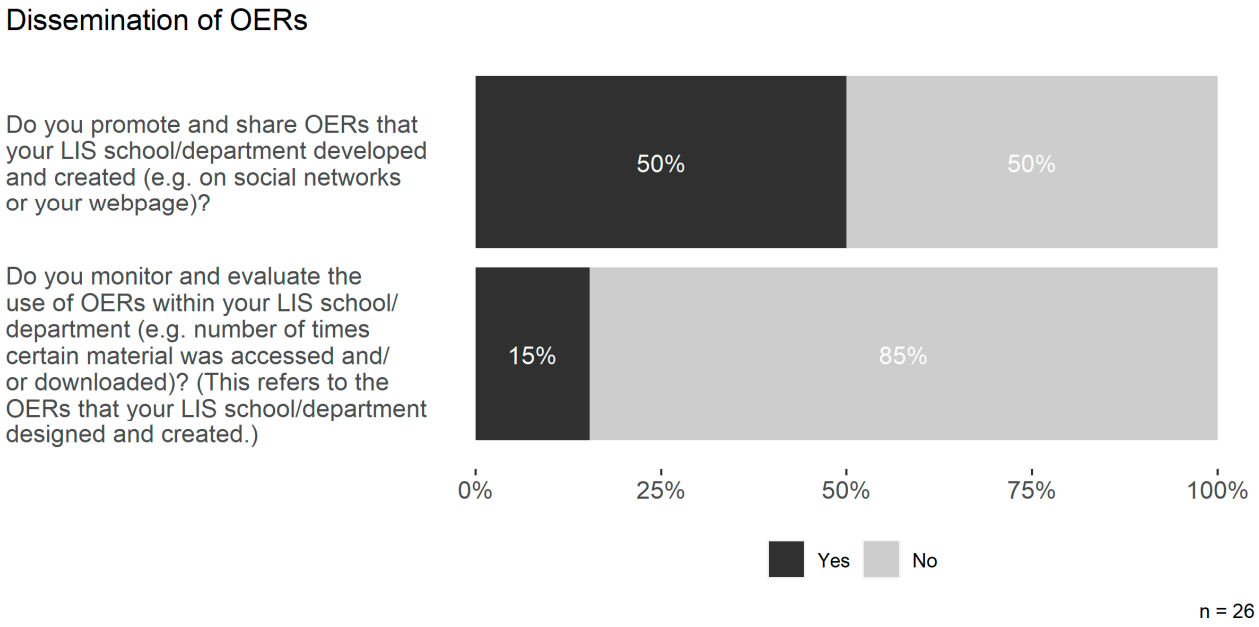

Figure 13. Dissemination of OERs.

4. Discussion

The COVID-19 pandemic has drastically altered the landscape of higher education, compelling many institutions to swiftly transition to online learning. In this context, open educational resources (OERs) have gained prominence as an accessible and affordable way to provide educational materials to students. Although OERs have not been widely adopted in the field of library and information science (LIS), certain institutional and national incentives and policies have fostered a positive shift in the perception and understanding of their significance and their impact on higher education in the LIS field. Key reasons for not using OERs have been identified, but several factors still contribute to their use and implementation. Finally, the role of libraries in developing, adapting, and using OERs in higher education in the LIS field has been recognized, which serves as an additional incentive for LIS higher education institutions (HEIs) to actively engage themselves in OER projects and initiatives. By addressing the current state of OERs in the field of LIS, we can provide a comprehensive overview of OERs and the role they play in higher education, in the context of crisis situations such as the pandemic, and beyond.

More specifically, the results of this study indicate various tendencies, trends, and shifts in LIS higher education regarding OERs during the pandemic. These will be discussed in terms of both the previous theoretical background and the stated research question.

According to the works of the authors [23,35] and others [30,34,36,40,41], OER repositories play a crucial role in discovering and using OERs. This study found that while most LIS HEIs believe that OER repositories are vital for discovering and using OERs, many LIS schools/departments lack national and LIS OER repositories. However, nearly half of the schools/departments do possess institutional repositories with OERs. Therefore, LIS HEIs and the LIS community should make more effort to create OER repositories, both at the national level and within the LIS community. Besides their practical use, repositories can increase awareness among stakeholders and policymakers about the value of OERs and their effect on higher education, potentially leading to more models and funding sources being utilized to support their development and use.

Previous research [27,68,69] has emphasized the importance of institutional OER policies, support, and a strategic implementation plan. However, this study revealed that creating and using OERs is often an individual endeavor, as suggested by [67]. More than two-thirds of LIS schools/departments do not have an institutional policy on OERs, which can diminish awareness of the importance of OERs and reduce motivation and

incentives to use them. Nevertheless, some LIS schools/departments have government measures or projects that provide public funding for OERs' development and adoption. These policies can aid in creating frameworks for designing and implementing OERs, as well as establishing professional networks that offer organizational and practical support while providing opportunities for peer production of OERs.

Several studies [19,36,64,69,71] have identified lack of awareness, accessibility, copyright and licensing issues, and time constraints as common barriers to OER adoption. This study confirmed these findings, as 54% of LIS schools/departments did not use OERs during the pandemic. The two most common reasons given by the LIS HEIs are that adopting OERs is mostly an individual teacher's decision or that they already use different teaching materials, for instance, those already a part of Moodle courses. Other reasons included lack of resources, integration, coordination, motivation, support, incentives, and even lack of institutional pressure. Time was also an issue, as the pandemic posed organizational challenges for many HEIs. Most of the reasons given stem from unawareness of the OER concept itself and the impact it can have on higher education.

There are various strategies to encourage LIS schools/departments and their teachers/educators to adopt OERs, such as offering institutional support and financial incentives, allowing teachers/educators more time, and recognizing their work with OERs [21]. The results of this study suggest that both institutional and personal motivations contain similar components. Most participants expressed that raising awareness of OERs, open education, and open science could stimulate OER adoption. Also, providing teachers/educators with more time, resources, and flexibility, acknowledging and rewarding their work, providing funding and bonuses, creating policies, and even making it a requirement could be motivational. There is not a one-size-fits-all approach that works for all institutions and meets their program needs, so informed planning and strategic development are necessary for OER adoption. The LIS community and LIS HEIs should be encouraged to incorporate OERs into their curricula and to publish existing educational materials as OERs.

Although there are existing educational materials in Moodle and other learning management systems (LMS) readily available for use, and the adoption of OERs is generally low, certain LIS schools/departments have valid reasons for using OERs. These reasons include the opportunity to use OERs developed by others at the national or international level, or those designed, developed, and created by their own teachers/educators. The main reasons for using OERs during the pandemic include their capacity to promote flexible, effective, and quality teaching and learning, open education and knowledge sharing, distance education, and resource-based learning.

In terms of implementing different aspects of OERs, the trends differ.

Previous research [40,41,43,45,48,49] has underscored the importance of high-quality OERs. This study, however, revealed that many LIS schools/departments did not ensure peer review for OERs. This is a significant issue, as peer review enhances the quality and efficacy of OERs and promotes their use. The number of peer-reviewed OERs is gradually increasing, but it is usually up to the teachers/educators to evaluate them.

The study's results indicate that the curation and management of OERs are typically performed by the teacher/educator who created them, or the academic library. This could mean that individual responsibility might be a factor deterring many teachers/educators and institutions from creating new OERs. Furthermore, they are usually the only ones responsible for all aspects of OER production, from planning and designing to evaluating, curating, and promoting. In some cases, the academic library provides support.

In terms of software used, previous studies [7,38,51,78] have highlighted the importance of Free/Libre and Open Source Software (F(L)OSS) and Web 2.0 tools and services for OER development and implementation. This study found that more than half of the OERs created within LIS schools/departments were made with F(L)OSS. Tools and systems that enable open collaboration and free use and reuse of educational materials, resources, and infrastructure are especially relevant to OERs and open education.

Copyright and open licensing are significant concerns regarding OER adoption [7,13,38,51,85–87]. This study showed that most OERs created within LIS schools/departments were published with an open license. This should be a requirement, especially for publicly funded educational materials and resources. Understanding the licensing framework is crucial, as it determines how the OERs will be used. However, most respondents did not recognize Creative Commons as an open licensing framework, even those who stated they use open licensing.

The promotion and sharing of OERs, as well as their monitoring and evaluation, need enhancement. Despite various "push" and "pull" strategies [79] and specific actions [13,39,81–84] for promotion and sharing, only half of the LIS schools/departments using OERs also promoted and shared them, while most of them did not monitor and evaluate OER use. This indicates a need for more focus on promoting and sharing existing OERs. However, this also implies additional responsibilities for teachers/educators, especially if they are in charge of the OERs. The lack of monitoring and evaluation might hinder OER adoption, as data gathered through these activities provide a baseline for raising awareness about OERs and help improve them at the policy and programmatic level.

The final aspect of the OERs examined refers to the role of libraries in the development, adaptation, and advancement of OERs in LIS higher education. Unquestionably, academic libraries, already recognized as learning resource centers, can harness the transformative potential of OERs. The importance of libraries and librarians, as long-term advocates of the OER movement, has been widely acknowledged in numerous studies [85,88–95]. During the pandemic, the role of academic libraries has been instrumental in the development, adoption, and use of OERs. Apart from extending some of their existing services and creating new ones, such as online reservations, curbside book delivery, etc., their role encompassed providing resources (library materials) for planning, designing, and creating OERs, offering infrastructure, and involving library staff directly in the development of OERs, either as a project/activity leader or partner. Thus, it is clear that investing resources into the upskilling and reskilling of library staff, as well as defining their role and responsibilities in the institution regarding OERs, is necessary. It's important to note that the term "collaboration with the academic library" in this research implies both narrow and broad meanings of the term "collaboration". Narrow meaning refers to "collaboration with academic library", i.e., active participation of the library staff in the adoption of OERs, and broad meaning refers to "with the support of the academic library", i.e., using library materials and infrastructure for the implementation of OERs.

Finally, we need to discuss the appropriateness of OERs in the context of LIS studies and the LIS professional community. Our results align with previous studies [96–98,100–102] and they suggest the need to develop LIS curricula that are more rooted in the principle of openness, introduce information literacy for open education and OERs, and establish OER training programs for LIS professionals, especially academic librarians who are expected to actively participate in open educational practices (OEP). The analysis of advantages and benefits that OERs offer to the teaching process [23,61,62], especially in the field of LIS studies [103,104], will be carried out within IO2 of the DECriS project.

Overall, research on the relationship and interaction between the culture of OERs and the discipline of LIS is limited. However, certain studies, like this one, reveal emerging perspectives and significant leadership opportunities for LIS professionals, especially academic librarians, in adopting open education, open pedagogies, and OERs. To advance these perspectives, the LIS discipline needs to affirm its place and role in the OER community. This can be accomplished in various ways, ranging from opening the curriculum in LIS departments and schools, and adopting openness as one of the primary concepts of information literacy, to actively involving LIS professionals in all phases of OER projects (from design to promotion and evaluation). This active involvement is influenced by LIS professionals' understanding of the concept of OERs and its impact on higher education, by their self-perception and expectations regarding their role in the open education movement and OER initiatives, and by their ability to define their responsibilities within OER

projects. Diversifying LIS studies and professions in terms of openness and establishing true OER librarianship is rooted in redefining knowledge as a common good, especially considering the trend of commodification of knowledge, but also in the greater adoption of open practices within LIS departments, schools, and institutions; not just open access (OA) and OERs, but also open licensing, open formats, open standards, open data, and F(L)OSS. The strength of such professional shifting lies in the fact that its benefits extend beyond the LIS discipline and community.

This study has several limitations that should be considered. The first is the method used to gather data, as it can be challenging for heads/directors of LIS schools/departments to track all the decisions and activities of individual teachers and educators. This will be further examined in the DECriS project through subsequent intellectual outputs. The second is the small sample size, with only 26 of the 56 participants using OERs, which affects the ability to draw broader conclusions and fully generalize statistical results. Finally, there is a lack of clarity in the understanding of the term OERs among a smaller number of participants, which influenced the responses and results of the study. Similarly, some participants struggled to distinguish clearly between different concepts, such as between published digital learning materials and published OERs, between authoring tools and software and OER repository management software. Also, concepts such as open-source software, locally developed software, and proprietary software were sometimes vaguely used.

5. Concluding Remarks

The COVID-19 pandemic has initiated numerous studies on OERs and encouraged the establishment of new OER initiatives. Many HEIs have recognized the potential of OERs to revolutionize higher education and expand access to it, particularly in terms of cost-effectiveness and resilience. When combined with open licensing, open technologies, open standards, and open formats, OERs have the potential to have a long-term impact on LIS higher education, particularly during times of crisis.

This study has highlighted some challenging trends concerning OERs. These challenges include a lack of awareness, policy, resources, and funding, suggesting a need for a more solid and strategic approach towards designing and utilizing OERs. There should be a focus on more sustainable and widespread adoption of OERs within LIS HEIs, as well as a stronger commitment to open education and OERs in the LIS community. Moreover, there is a necessity to develop institutional strategies that prioritize capacity-building and provide high-quality infrastructure and services that support exemplary OER practices. Further studies should be conducted in relation to monitoring and evaluating OERs, given their pivotal role in ensuring OERs optimization, consistent funding and sociopolitical, cultural and economic support for designing quality OERs. Lastly, the LIS community should explore ways for current and future library professionals and information scientists to participate in activities that advance OERs and the OER movement.

As previously mentioned, one significant limitation of this study is the ambiguous understanding of the concept of OERs within the academic community, and the lack of awareness about benefits and opportunities OERs provide for higher education. This study is, therefore, beneficial in raising awareness and improving understanding of OERs' potential, particularly in emphasizing the importance of developing OER policies, especially in terms of democratizing education. The findings from this study can be employed to aid teachers, students, institutions and stakeholders in the development of OER policies and the design of initiatives to ensure their optimal use, both in general and in crisis situations such as the COVID-19 pandemic. Furthermore, research and discussion on democratizing educational content and activities, as well as studies on OERs, can foster a free, open, inclusive and democratic society.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/publications11030038/s1.

Author Contributions: Conceptualization: M.M. and K.F. Methodology: S.R. and M.M. Software: S.R. Validation: M.M., S.R. and K.F. Formal Analysis: S.R. Investigation: M.M., S.R. and K.F. Resources: M.M., S.R. and K.F. Data curation: S.R. Writing—Original Draft Preparation: M.M., S.R. and K.F. Writing—Review & Editing: M.M., S.R. and K.F. Visualization: M.M., S.R. and K.F. Supervision: M.M. All authors have read and agreed to the published version of the manuscript.

Funding: This paper is a product of work that has been supported by Erasmus+ Programme of European Union (project Digital Education for Crisis Situations: Times when there is no alternative (DECriS), Erazmus+ funded project, no. 2020-1-HR01-KA226-HE-094685). The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to Erasmus+ project agreement.

Acknowledgments: We would like to thank all who participated in the original research State-of-the-play of the use of OERs at European higher education institutions in the field of Library and Information Science during the COVID-19 pandemic which was done as part of the Erasmus+ project Digital Education for Crisis Situations: Times when there is no alternative (DECriS) https://decris.ffos.hr/. First and foremost, we would like to thank our colleagues Tatjana Aparac-Jelušić, Boris Badurina, Boris Bosančić, Sanjica Faletar Tanacković, Sandra Kučina Softić, Irena Jandrić, Cristóbal Urbano, Gemma Santos-Hermosa, Juan José Boté Vericad, Sílvia Argudo Plans, Tania Todorova, Eugenia Kovatcheva, Thomas Mandl and Lea Wöbbekind. We would also like to thank our project partners Stiftung Universität Hildesheim, Germany, Universitat de Barcelona, Spain, University of Library Studies and Information Technologies, Bulgaria, and University of Zagreb, University computer centre (SRCE), Croatia, as well as our project associate partners Univerzitet u Sarajevu, Bosnia and Herzegovina, University of Mostar, Bosnia and Herzegovina, Victoria University of Wellington, New Zealand, and St. Petersburg State University of Culture, Russia.

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

References

1. Digital Education for Crisis Situations: Times When There Is No Alternative. Available online: https://decris.ffos.hr/ (accessed on 27 May 2023).
2. Wiley, D.; Gurrell, S. A decade of development. *Open Learn. J. Open Distance E-Learn.* **2009**, *24*, 11–21. [CrossRef]
3. Peter, S.; Deimann, M. On the role of openness in education: A historical reconstruction. *Open Prax.* **2013**, *5*, 7–14. [CrossRef]
4. DeRosa, R.; Jhangiani, R. Open Pedagogy. In *A Guide to Making Open Textbooks with Students*; Mays, E., Ed.; The Rebus Community for Open Textbook Creation: Montreal, QC, Canada, 2017; pp. 7–20.
5. Open Society Institute; Shuttleworth Foundation. The Cape Town Open Education Declaration. Available online: https://www.capetowndeclaration.org/read/ (accessed on 27 May 2022).
6. UNESCO. The Paris OER Declaration 2012. Available online: https://en.unesco.org/oer/paris-declaration (accessed on 27 May 2022).
7. UNESCO. Recommendation on Open Educational Resources (OER). Available online: https://www.unesco.org/en/legal-affairs/recommendation-open-educational-resources-oer (accessed on 24 May 2022).
8. Hilton, J.L.; Wiley, D.; Stein, J.; Johnson, A. The four 'R's of openness and ALMS analysis: Frameworks for open educational resources. *Open Learn. J. Open Distance e-Learn.* **2010**, *25*, 37–44. [CrossRef]
9. Wiley, D.; Bliss, T.J.; McEwen, M. Open Educational Resources: A Review of the Literature. In *Handbook of Research on Educational Communications and Technology*; Spector, J.M., Merrill, M.D., Elen, J., Bishop, M.J., Eds.; Springer: New York, NY, USA, 2014; pp. 781–789.
10. Wiley, D. The Access Compromise and the 5th R. Available online: https://opencontent.org/blog/archives/3221 (accessed on 24 May 2022).
11. Sabadie, J.M.A.; Muñoz, J.C.; Punie, Y.; Redecker, C.; Vuorikari, R. OER: A European policy perspective. *J. Interact. Media Educ.* **2014**, *2014*, 5. [CrossRef]
12. Inamorato Dos Santos, A.; Punie, Y.; Castaño Muñoz, J. *Opening Up Education: A Support Framework for Higher Education Institutions*; Publications Office of the European Union: Luxembourg, 2016.
13. UNESCO & Commonwealth of Learning. *Guidelines for Open Educational Resources (OER) in Higher Education*; UNESCO COL: Paris, France, 2015; p. 2.

14. Cronin, C. Openness and Praxis: Exploring the Use of Open Educational Practices in Higher Education. *Int. Rev. Res. Open Distrib. Learn.* **2017**, *18*, 1–21. [CrossRef]
15. Commonwealth of Learning. *Open Educational Resources in the Commonwealth 2021*; Commonwealth of Learning (COL): Burnaby, BC, Canada, 2022.
16. Meng, X.; Cui, C.; Wang, X. Looking Back Before We Move Forward: A Systematic Review of Research on Open Educational Resources. In Proceedings of the Ninth International Conference of Educational Innovation through Technology (EITT), Porto, Portugal, 13–17 December 2020; pp. 92–96.
17. Tlili, A.; Burgos, D.; Huang, R.; Mishra, S.; Sharma, R.C.; Bozkurt, A. An Analysis of Peer-Reviewed Publications on Open Educational Practices (OEP) from 2007 to 2020: A Bibliometric Mapping Analysis. *Sustainability* **2021**, *13*, 10798. [CrossRef]
18. Mishra, M.; Dash, M.K.; Sudarsan, D.; Santos, C.A.G.; Mishra, S.K.; Kar, D.; Bhat, I.A.; Panda, B.K.; Sethy, M.; Silva, R.M.d. Assessment of trend and current pattern of open educational resources: A bibliometric analysis. *J. Acad. Librariansh.* **2022**, *48*, 102520. [CrossRef]
19. Belikov, O.M.; Bodily, R. Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions. *Open Prax.* **2016**, *8*, 235–246. [CrossRef]
20. Katz, S.; Van Allen, J. Evolving into the Open: A Framework for Collaborative Design of Renewable Assignments. In *Open Pedagogy Approaches*; Davies Hoffman, K., Clifton, A., Eds.; Milne Publishing: New York, NY, USA, 2020.
21. Nagashima, T.; Hrach, S. Motivating Factors among University Faculty for Adopting Open Educational Resources: Incentives Matter. *J. Interact. Media Educ.* **2021**, *2021*, 19. [CrossRef]
22. UNESCO. COVID-19 Crisis: UNESCO Call to Support Learning and Knowledge Sharing through Open Educational Resources. Available online: https://www.unesco.org/en/articles/covid-19-crisis-unesco-call-support-learning-and-knowledge-sharing-through-open-educational (accessed on 10 June 2022).
23. Van Allen, J.; Katz, S. Teaching with OER during pandemics and beyond. *J. Multicult. Educ.* **2020**, *14*, 209–218. [CrossRef]
24. Zhang, X.; Tlili, A.; Huang, R.; Chang, T.; Burgos, D.; Yang, J.; Zhang, J. A Case Study of Applying Open Educational Practices in Higher Education during COVID-19: Impacts on Learning Motivation and Perceptions. *Sustainability* **2020**, *12*, 9129. [CrossRef]
25. Doi, C.; Lucky, S.; Rubin, J. Open Educational Resources in the Time of COVID-19: Two Case Studies of Open Video Design in the Remote Learning Environment. *KULA Knowl. Creat. Dissem. Preserv. Stud.* **2022**, *6*, 1–15. [CrossRef]
26. Tlili, A.; Nascimbeni, F.; Burgos, D.; Zhang, X.; Huang, R.; Chang, T.-W. The evolution of sustainability models for Open Educational Resources: Insights from the literature and experts. *Interact. Learn. Environ.* **2023**, *31*, 1421–1436. [CrossRef]
27. Miao, F.; Mishra, S.; Orr, D.; Janssen, B. *Guidelines on the Development of Open Educational Resources Policies*; UNESCO COL: Paris, France; Burnaby, BC, Canada, 2019.
28. Stevens, J.; Bradbury, S.; Hutley, S. Open Education in Practice—How Policy Can Lead to Positive Change. *J. Aust. Libr. Inf. Assoc.* **2017**, *66*, 249–258. [CrossRef]
29. Skidmore, J.M.; Provida, M. *A Place for Policy: The Role of Policy in Supporting Open Educational Resources and Practices at Ontario's Colleges and Universities*; eCampus Ontario: Toronto, ON, Canada, 2019.
30. Allen, N.; Browne, D.; Forward, M.L.; Green, C.; Tarkowski, A. Foundation for OER Strategy Development. Available online: http://www.oerstrategy.org/home/read-the-doc/ (accessed on 1 June 2022).
31. Santos-Hermosa, G.; Ferran-Ferrer, N.; Abadal, E. Repositories of Open Educational Resources: An Assessment of Reuse and Educational Aspects. *Int. Rev. Res. Open Distrib. Learn.* **2017**, *18*, 84–120. [CrossRef]
32. Altaher, A.; Khomsi, A.; Khashkusha, A.; Madi, H. Quality Evaluation of Open Educational Resources based on Academic and Technical Aspects: State of the Art Review. *J. Pure Appl. Sci.* **2020**, *19*, 32–36. [CrossRef]
33. Singh, S. Role of National Digital Library of India (NDLI) for facilitating open access resources (OARs): An investigation on COVID-19 research repository. *Digit. Libr. Perspect.* **2022**, *38*, 493–507. [CrossRef]
34. Kalz, M.; Drachsler, H.; van Bruggen, J.; Hummel, H.; Koper, R. Wayfinding Services for Open Educational Practices. *Int. J. Emerg. Technol. Learn.* **2008**, *3*, 24–28. [CrossRef]
35. Wenk, B. Open educational resources (OER) inspire teaching and learning. In Proceedings of the IEEE EDUCON 2010 Conference, Madrid, Spain, 14–16 April 2010; pp. 435–442.
36. Luo, T.; Hostetler, K.; Freeman, C.; Stefaniak, J. The power of open: Benefits, barriers, and strategies for integration of open educational resources. *Open Learn. J. Open Distance E-Learn.* **2020**, *35*, 140–158. [CrossRef]
37. Shank, J.D. *Interactive Open Educational Resources: A Guide to Finding, Choosing, and Using What's Out There to Transform College Teaching*; Jossey-Bass: San Francisco, CA, USA, 2014.
38. Butcher, N.; Moore, A. *Understanding Open Educational Resources*; Commonwealth of Learning: Vancuver, BC, Canada, 2015; p. 50.
39. Grégoire, R.; Youga Dieng, P. *OER Trainer's Guide v 1.1: Competency Framework Open Educational Resources*; Organisation Internationale de la Francophonie: Paris, France, 2016.
40. Clements, K.I.; Pawlowski, J.M. User-oriented quality for OER: Understanding teachers' views on re-use, quality, and trust. *J. Comput. Assist. Learn.* **2012**, *28*, 4–14. [CrossRef]
41. Gordillo, A.; López-Fernández, D.; Verbert, K. Examining the Usefulness of Quality Scores for Generating Learning Object Recommendations in Repositories of Open Educational Resources. *Appl. Sci.* **2020**, *10*, 4638. [CrossRef]

42. Marín, V.I.; Zawacki-Richter, O.; Aydin, C.H.; Bedenlier, S.; Bond, M.; Bozkurt, A.; Conrad, D.; Jung, I.; Kondakci, Y.; Prinsloo, P.; et al. Faculty perceptions, awareness and use of open educational resources for teaching and learning in higher education: A cross-comparative analysis. *Res. Pract. Technol. Enhanc. Learn.* **2022**, *17*, 11. [CrossRef]
43. Baas, M.; van der Rijst, R.; Huizinga, T.; van den Berg, E.; Admiraal, W. Would you use them? A qualitative study on teachers' assessments of open educational resources in higher education. *Internet High. Educ.* **2022**, *54*, 2–14. [CrossRef]
44. Almendro, D.; Silveira, I.F. Quality Assurance for Open Educational Resources: The OERTrust Framework. *Int. J. Learn. Teach. Educ. Res.* **2018**, *17*, 1–14. [CrossRef]
45. Atenas, J.; Havemann, L. Questions of quality in repositories of open educational resources: A literature review. *Res. Learn. Technol.* **2014**, *22*, 20889. [CrossRef]
46. Camilleri, A.; Ehlers, U.; Pawlowski, J. *State of the Art Review of Quality Issues Related to Open Educational Resources (OER)*; Publications Office: Luxemburg, 2014.
47. Güler, C.; Altun, A. Teacher Trainees as Learning Object Designers: Problems and Issues in Learning Object Development Process. *Turk. Online J. Educ. Technol.* **2010**, *9*, 118–127.
48. Custard, M.; Sumner, T. Using Machine Learning to Support Quality Judgments. *D-Lib Mag.* **2005**, *11*, 1082–9873. [CrossRef]
49. Hylén, J. *Open Educational Resources: Opportunities and Challenges*; OECD's Centre for Educational Research and Innovation: Paris, France, 2006.
50. McGreal, R. *Creating, Using and Sharing Open Educational Resources*; Commonwealth of Learning: Vancuver, BC, Canada, 2013.
51. OECD. *Giving Knowledge for Free: The Emergence of Open Educational Resources*; OECD Publishing: Paris, France, 2007.
52. Villavicencio, M.; Revelo, H.V.; Pincay, J. Towards the evaluation of open educational resources for learning software engineering. In Proceedings of the 2016 XLII Latin American Computing Conference (CLEI), Valparaiso, Chile, 10–14 October 2016; pp. 1–9.
53. Leacock, T.L.; Nesbit, J.C. A Framework for Evaluating the Quality of Multimedia Learning Resources. *J. Educ. Technol. Soc.* **2007**, *10*, 44–59.
54. Kawachi, P. *Quality Assurance Guidelines for Open Educational Resources: TIPS Framework*; Commonwealth Educational Media Centre for Asia: New Delhi, India, 2014.
55. Yuan, M.; Recker, M. Not All Rubrics Are Equal: A Review of Rubrics for Evaluating the Quality of Open Educational Resources. *Int. Rev. Res. Open Distrib. Learn.* **2015**, *16*, 16–38. [CrossRef]
56. Ward, E.J.; Lindshield, B.L. Performance, behaviour and perceptions of an open educational resource-derived interactive educational resource by online and campus university students. *Res. Learn. Technol.* **2020**, *28*, 1–18. [CrossRef]
57. Hilton, J. Open educational resources, student efficacy, and user perceptions: A synthesis of research published between 2015 and 2018. *Educ. Technol. Res. Dev.* **2020**, *68*, 853–876. [CrossRef]
58. Hollister, C. Using Open Pedagogy to Engage LIS Students: A Case Study. *J. Librariansh. Sch. Commun.* **2020**, *8*, 2357. [CrossRef]
59. Cozart, D.; Horan, E.M.; Frome, G. Rethinking the Traditional Textbook. *Teach. Learn. Inq.* **2021**, *9*, 1–17. [CrossRef]
60. McGreal, R. A Survey of OER Implementations in 13 Higher Education Institutions. *Int. Rev. Res. Open Distrib. Learn.* **2019**, *20*, 141–145. [CrossRef]
61. Lee, D.; Lee, E. International perspectives on using OER for online learning. *Educ. Technol. Res. Dev.* **2021**, *69*, 383–387. [CrossRef]
62. Kelly, H. Learning Everywhere: Open Educational Resources in the COVID-19 Era. Available online: https://www.calstate.edu/csu-system/news/Pages/OER-Helps-COVID-Era.aspx (accessed on 23 June 2023).
63. Rolfe, V. Open educational resources: Staff attitudes and awareness. *Res. Learn. Technol.* **2012**, *20*, 1–13. [CrossRef]
64. Allen, I.E.; Seaman, J. *Opening the Curriculum: Open Educational Resources in U.S. Higher Education*; Babson Survey Research Group: Boston MA, USA, 2014; pp. 1–42.
65. Allen, T. Awareness and Future Use of Open Educational Resources by Music Faculty. *Update Appl. Res. Music Educ.* **2023**, *41*, 48–59. [CrossRef]
66. Christoforidou, A.; Georgiadou, E. Awareness and Use of OER by Higher Education Students and Educators within the Graphic Arts Discipline in Greece. *Educ. Sci.* **2022**, *12*, 16. [CrossRef]
67. Friesen, N. Open Educational Resources: New Possibilities for Change and Sustainability. *Int. Rev. Res. Open Distrib. Learn.* **2009**, *10*, 1–13. [CrossRef]
68. Murphy, A. Open educational practices in higher education: Institutional adoption and challenges. *Distance Educ.* **2013**, *34*, 201–217. [CrossRef]
69. Windle, R.J.; Wharrad, H.; McCormick, D.; Laverty, H.; Taylor, M.G. Sharing and reuse in OER: Experiences gained from open reusable learning objects in health. *J. Interact. Media Educ.* **2010**, *2010*, 4. [CrossRef]
70. Yang, Z.Y.; Li, Y. University Faculty Awareness and Attitudes towards Open Access Publishing and the Institutional Repository: A Case Study. *J. Librariansh. Sch. Commun.* **2015**, *3*, eP1210. [CrossRef]
71. Ozdemir, O.; Bonk, C. Turkish Teachers' Awareness and Perceptions of Open Educational Resources. *J. Learn. Dev.* **2017**, *4*, 307–321. [CrossRef]
72. Mishra, K.; Boland, M.V.; Woreta, F.A. Incorporating a virtual curriculum into ophthalmology education in the coronavirus disease-2019 era. *Curr. Opin. Ophthalmol.* **2020**, *31*, 380–385. [CrossRef]
73. Saadeh, K.; Henderson, V.; Paramasivam, S.J.; Jeevaratnam, K. To what extent do preclinical veterinary students in the UK utilize online resources to study physiology. *Adv. Physiol. Educ.* **2021**, *45*, 160–171. [CrossRef] [PubMed]

74. Gerard, L.; Wiley, K.; Debarger, A.H.; Bichler, S.; Bradford, A.; Linn, M.C. Self-directed Science Learning During COVID-19 and Beyond. *J. Sci. Educ. Technol.* **2022**, *31*, 258–271. [CrossRef]
75. Molera, L.; Sánchez-Alcázar, E.J.; Faura-Martínez, Ú.; Lafuente-Lechuga, M.; Llinares-Ciscar, J.V.; Marín-Rives, J.L.; Martín-Castejón, P.J.; Puigcerver-Peñalver, M.C.; Sánchez-Antón, M.C. Embedding Sustainability in the Economics Degree of the Faculty of Economics and Business of the University of Murcia: A Methodological Approach. *Sustainability* **2021**, *13*, 8844. [CrossRef]
76. Risquez, A.; Mcavinia, C.; Desmond, Y.; Bruen, C.; Ryan, D.; Coughlan, A. Towards a Devolved Model of Management of OER? The Case of the Irish Higher Education Sector. *Int. Rev. Res. Open Distrib. Learn.* **2020**, *21*, 99–111. [CrossRef]
77. Caeiro-Rodríguez, M.; Pérez-Rodríguez, R.; García-Alonso, J.; Manso-Vázquez, M.; Llamas-Nistal, M. AREA: A social curation platform for open educational resources and lesson plans. In Proceedings of the 2013 IEEE Frontiers in Education Conference (FIE), Oklahoma City, OK, USA, 23–26 October 2013; pp. 795–801.
78. Vuckovic, B.; Martin, C. Free and Open Source Software (FOSS) and OER. In *Open Educational Resources: Conversations in Cyberspace*; D'Antoni, S., Savage, C., Eds.; UNESCO: Paris, France, 2009; pp. 105–126.
79. Glennie, J.; Harley, K.; Butcher, N. Conclusion: Reflections on Practice. In *Open Educational Resources and Change in Higher Education: Reflections from Practice*; Glennie, J., Harley, K., Butcher, N., van Wyk, T., Eds.; Commonwealth of Learning (COL), United Nations Educational, Scientific and Cultural Organization Section for Higher Education (UNESCO): Vancouver, BC, Canada, 2012; pp. 283–290.
80. Banzato, M. Barriers to teacher educators seeking, creating and sharing open educational resources: An empirical study of the use of OER in education in Italy. In Proceedings of the 2012 15th International Conference on Interactive Collaborative Learning (ICL), Villach, Austria, 26–28 September 2012; pp. 1–6.
81. Conole, G. Integrating OER into Open Educational Practices. In *Open Educational Resources and Change in Higher Education: Reflections from Practice*; Glennie, J., Harley, K., Butcher, N., van Wyk, T., Eds.; The Commonwealth of Learning: Vancouver, BC, Canada, 2012; pp. 111–124.
82. Orr, D.; Rimini, M.; Van Damme, D. *Open Educational Resources: A Catalyst for Innovation*; OECD: Paris, France, 2015.
83. van Wyk, T. Taking OER Beyond the OER Community: Policy Issues and Priorities. In *Open Educational Resources and Change in Higher Education: Reflections from Practice*; Glennie, J., Harley, K., Butcher, N., van Wyk, T., Eds.; The Commonwealth of Learning: Vancouver, BC, Canada, 2012; pp. 13–25.
84. Stafford, D. Promoting Open Educational Resources: A Beginner's Playbook. *Pa. Libr. Res. Pract.* **2020**, *8*, 103–114. [CrossRef]
85. Gumb, L. An open impediment: Navigating copyright and OER publishing in the academic library. *Coll. Res. Libr. News* **2019**, *80*, 202. [CrossRef]
86. Seibert, H.; Miles, R.; Geuther, C. Navigating 21st-Century Digital Scholarship: Open Educational Resources (OERs), Creative Commons, Copyright, and Library Vendor Licenses. *Ser. Libr.* **2019**, *76*, 103–109. [CrossRef]
87. Krishnan, M.S. Copyrights in OER publishing in India: The case of the National Programme on Technology-Enhanced Learning. In *Open Educational Resources: Policy, Costs and Transformation*; Miao, F., Mishra, S., McGreal, R., Eds.; UNESCO COL: Paris, France, 2016; pp. 99–104.
88. Hess, J.I.; Nann, A.J.; Riddle, K.E. Navigating OER: The Library's Role in Bringing OER to Campus. *Ser. Libr.* **2016**, *70*, 128–134. [CrossRef]
89. Reed, J.B.; Jahre, B. Reviewing the Current State of Library Support for Open Educational Resources. *Collect. Manag.* **2019**, *44*, 232–243. [CrossRef]
90. Thompson, S.D.; Muir, A. A case study investigation of academic library support for open educational resources in Scottish universities. *J. Librariansh. Inf. Sci.* **2020**, *52*, 685–693. [CrossRef]
91. Essmiller, K.; Thompson, P.; Alvarado-Albertorio, F. Performance Improvement Technology for Building a Sustainable OER Initiative in an Academic Library. *TechTrends* **2020**, *64*, 265–274. [CrossRef]
92. Miller, R.; Homol, L. Building an Online Curriculum Based on OERs: The Library's Role. *J. Libr. Inf. Serv. Distance Learn.* **2016**, *10*, 349–359. [CrossRef]
93. Goodsett, M.; Loomis, B.; Miles, M. Leading campus OER initiatives through library–faculty collaboration. *Coll. Undergrad. Libr.* **2016**, *23*, 335–342. [CrossRef]
94. George, K.W.; Casey, A.M. Collaboration between Library, Faculty, and Instructional Design to Increase All Open Educational Resources for Curriculum Development and Delivery. *Ref. Libr.* **2020**, *61*, 97–112. [CrossRef]
95. Sweet, C.A.; Clarage, E.C. Library consortia contributing to college affordability: Collection and OER initiatives in the Consortium of Academic and Research Libraries in Illinois. *Ref. Serv. Rev.* **2020**, *48*, 433–445. [CrossRef]
96. Santos-Hermosa, G.; Atenas, J. Building Capacities in Open Knowledge: Recommendations for Library and Information Science Professionals and Schools. *Front. Educ.* **2022**, *7*, 866049. [CrossRef]
97. Hate Vibhavari, B. LIS Professionals on Open Access Educational resources. *Int. Res. J. Sci. Eng.* **2020**, *Special Issue A7*, 756–761.
98. Wiche, H.; Ogunbodede, K.F. Awareness and Use of Open Educational Resources by Library and Information Science Students of Ignatius Ajuru University of and Information Science Students of Ignatius Ajuru University of Education, Rivers State, Nigeria Education, Rivers State. Nigeria. *Libr. Philos. Pract. (E-J.)* **2021**, 5373.
99. Charbonneau, D.H.; Vardell, E. Health sciences librarian research and instruction services in pandemic information environments. *J. Acad. Librariansh.* **2022**, *48*, 102553. [CrossRef] [PubMed]

100. Mery, Y.; Vieger, R.; Zeidman-Karpinski, A. Reuse and Remix: Creating and Adapting Open Educational Tutorials for Information Literacy. *Portal Libr. Acad.* **2022**, *22*, 559–569. [CrossRef]
101. Katz, S. The Case for OER in LIS Education. *Libr. Trends* **2020**, *69*, 419–434. [CrossRef]
102. Bell, S.J. Taking OER to the LIS: Designing and Developing an Open Education Course for Library Science Students. *Int. J. Open Educ. Resour.* **2021**, *4*, 61–77. [CrossRef]
103. Tsabedze, V.w. MOOCs and OER: A Model for Library and Information Science Education. *Internet Ref. Serv. Q.* **2021**, *25*, 87–106. [CrossRef]
104. Seo, G.; Sandy, H.M.; Wilson, G. Open Educational Resources: Barriers and Benefits in LIS Education. In Proceedings of the Library and Information Science Education Annual Conference: ALISE 2019, Knoxville, TN, USA, 24–26 September 2019; pp. 96–100.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.