Article

Awareness and Use of OER by Higher Education Students and Educators within the Graphic Arts Discipline in Greece

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Abstract: In recent years, Open Educational Resources (OER) have gained significant reach globally as a means of facilitating free and open access to educational materials. However, most of the empirical research on the adoption of OER in higher education is conducted in the US, while Europe and other countries, including Greece, fall behind. To that end, this research focused on the awareness and use of OER by higher education students and educators within the Graphic Arts discipline in Greece, to provide evidence regarding the adoption of OER to university administrations and libraries and encouraging their use across campus. The findings suggest that awareness is low, especially among undergraduate students, despite the fact that educators are aware of OER and already share their work as such. This paradox is probably related to students' vague knowledge of what OER are and how to use them for learning. Therefore, actions are required from educators, university administration and librarians to inform students of the benefits of OER adoption in the educational process as well as to communicate educators' OER efforts to students. Moreover, participants identified as the biggest obstacle for adopting OER in Graphic Arts the lack of a portal that accommodates OER for this discipline, which lays the groundwork for further research.

Keywords: open educational resources (OER); Graphic Arts studies; OER in Greece; higher education; OER on Printing Technology; OER on Graphic Design

1. Introduction

In recent years, Open Educational Resources (OER) have gained significant reach globally as a means of facilitating free and open access to educational materials, mainly due to increasing possibilities of digitization, greater access to the Internet and new flexible intellectual property licenses. Open Educational Resources are teaching, learning and research content that is 'libre' (openly-licensed content) and at the same time 'gratis' (free of charge). OER need to carry a visible open license, such as a Creative Commons one, or an explicit acknowledgment that the educational resource is free of charge and free to be used, shared, remixed, adapted, and distributed by others with no or limited restrictions, depending on the type of open license chosen. Content in the public domain is also considered OER. OER can have different granularity, varying from a learning object (e.g., a picture with a specific teaching purpose) to a full course (e.g., a MOOC or an open-libre and gratis-online course) [1].

The basic types of OER include open courseware, learning modules, open textbooks, streaming video, open-access journals, online tutorials and digital learning objects [2]. All OER types integrate a variety of format types, such as text, video, audio, images, and graphics.

The main ways to find OER are by using regular search engines (such as Google) with proper keywords; through dedicated OER search engines, or OER and Open Textbook Repositories such as MERLOT, Project Gutenberg, Europeana etc.; through university sites

that offer OER, such as MIT Open Courseware, OpenLearn, Free Learning from The Open University, UK; and MOOC platforms such as Coursera [3–5]. Moreover, some universities' libraries provide lists to OER search engines, repositories, etc., such as 'The Big List of Resources' from University of Pittsburgh Library [6]. Moreover, an excellent platform to locate OER is the 'OER World Map', initiated in 2015 and constantly updated, which includes 331 OER repositories that can be filtered according to country, language, subject, audience and license used (https://oerworldmap.org/, accessed on 27 September 2021).

> 'In the current knowledge-driven global economy, higher education systems play major roles in social development and national economic competitiveness. However, they face immense challenges in meeting rising enrolment demands worldwide. Forecasts suggest that current global enrolments of 165 million will grow by a further 98 million by 2025. However, this growth is unlikely to be accompanied by equivalent increases in the human and financial resources available to the higher education sector'. [7]

Therefore, the integration of OER into higher education can improve the quality of curricula and teaching and reduce costs, a fact of particular importance to poor countries, as many benefits are associated with their use for teaching and learning, such as: (a) expanded access to learning, as students and educators anywhere in the world can access repeatedly OER at any time, (b) scalability, as OER are easy to distribute widely at no cost other than the right equipment and access to the Internet, (c) augmentation of class materials, giving faculty the ability to enhance regular course content with multimedia and further customize it to students' needs, (d) quick circulation that increases the timeliness and/or relevance of the material being presented, (e) showcasing of innovation, (f) ties for alumni, as OER provide a way for alumni to stay connected to the institution and continue with a program of lifelong learning, and (g) continually improved resources through direct editing by users or through solicitation and incorporation of user feedback [8].

The research landscape in this field is constantly changing and mainly addresses issues of adoption, impact, cost savings, authoring and publication. A useful overview of the research on OER can be found at the 'Review Project' from the Open Education Group, which provides a summary of all known empirical research on the impacts of OER adoption [9]. Another important research project is the Research on Open Educational Resources for Development (ROER4D) project, which provides evidence-based research on OER adoption across several countries in South America, Sub-Saharan Africa and Southeast Asia [10]. Moreover, an updated list of OER initiatives worldwide can be found in the German Education server [11].

Results across many studies suggest students achieve the same or better learning outcomes when using OER while saving significant amounts of money. In addition, the majority of faculty and students who have used OER had a positive experience and would do so again [12]. However, awareness and use of OER in education worldwide is low [13–17]. In the US, awareness is improving year by year [18], triggered also by the sudden shift to remote instruction caused by the COVID-19 pandemic that stimulated significant and potentially lasting changes to the landscape of instructional materials. The Fall 2020 academic term in US saw a dramatic shift in the proportion of higher education faculty teaching online, driving a transition of existing courses and educational materials into digital formats, according to a survey of faculty conducted by Bay View Analytics on behalf of the William and Flora Hewlett Foundation. Survey results also stressed that while both faculty awareness of and belief in the quality of open educational resources have risen, usage of OER remains unchanged [19].

Research revealed that the time and effort required to find, retrieve, evaluate and adapt OER was the most significant barrier to OER adoption by faculty [20–22]. Moreover, the adoption of OER in non-English speaking countries is another obstacle as the predominant language for OER is English.

Research results provide useful information regarding the adoption of OER in higher education, considering the recorded benefits. However, most of the empirical research

on the adoption of OER in higher education is conducted in the US, while Europe and other countries, including Greece, fall behind. To that end, this research focused on the perception and awareness of OER among higher education students and educators within the Graphic Arts discipline in Greece. As OER have emerged as a viable alternative to expensive commercial textbooks, offering a more affordable means of learning, the purpose of the study was to provide evidence on the adoption of OER by Graphic Arts students and educators in Greece to university administration and libraries for encouraging their use across campus by promoting and supporting the use of course materials that may be freely accessed, reused, modified, and shared among faculty.

The paper first examines OER for the Graphic Arts discipline; next, it presents empirical research on awareness and use of OER by higher education students and educators within the Graphic Arts discipline in Greece (participants and data collection methods, research instruments and data analysis); and finally, it provides conclusions from and discussion on the current study.

2. OER for the Graphic Arts Discipline

Graphic Arts is a scientific discipline that combines Graphic Design and Graphic Arts Technology. Graphic design communicates certain ideas or messages in a visual way—it is also referred to as visual communication or communication design—while graphic arts technology covers a wide range of technologies and production processes aimed towards proper preparation, adaptation, industrial mass production, post-production and distribution of information, mainly on paper, but also increasingly digitally [23]. Therefore, this discipline is characterized by broad interdisciplinarity as it targets the creation of several forms of media: print, electronic and interactive, as well as interactive print that combines print and electronic media using augmented reality technology.

Educators and students do not have access to a list that includes only OER for Graphic Arts, and they need to use proper keywords in common and OER search engines, OER repositories, etc., determined each time by their educational needs. For example, keywords such as 'Graphic Arts', 'Graphic Design', 'Visual Communication', 'Printing Technology', 'History of Graphic Arts', and 'Graphic Design History' can lead to resources that cover the core of Graphic Arts; 'offset', 'gravure printing', 'flexography', etc., can be used to locate specialized knowledge on printing techniques; 'book design', 'packaging design', 'graphic design principles', etc., can be used for design issues; 'photoshop tutorials', 'illustrator tutorials', etc., can be used for design software training.

There are many OER in repositories or on other platforms, such as YouTube, that cover the whole or aspects of Graphic Arts, offering different types and forms of educational material that can enhance the learning process in this discipline. There are several repositories that can be used to locate OER for Graphic Arts in the form of textbooks, courses, source materials, interactive simulations, audiobooks, modules, open access books, videos, podcasts, learning objects, etc., such as OER Commons, Open Education Consortium, Open Professionals Education Network, Teaching Commons, FutureLearn, OASIS, etc. For example, a search performed in November 2021 in the OER Commons portal (www.oercommons.org/, accessed on 27 September 2021) under the filters 'subject > art and humanities' and 'level > college/upper division' returned 23 results for the 'graphic arts' keyword, 11 for 'graphic design', and 859 for 'printing'.

OER for Graphic Arts can be found at large universities' sites, e.g., the Open University, UK; Massachusetts Institute of Technology Open Courseware; Coursera, founded by Stanford University; etc. For example, a search performed in November 2021 in the Open University OER portal OpenLearn (www.open.edu/openlearn/, accessed on 27 September 2021) returned 2005 results for the 'graphic arts' keyword, 1150 for 'graphic design', 28,400 for 'printing' and 1870 for 'visual communication'. Besides OpenLearn, Open University includes resources for free learning on YouTube, iTunes, BBC, Amazon Kindle, Google Play and FutureLearn.

Thousands of OER for Graphic Arts were returned in search results via Creative Commons and Google Advanced Search for web pages according to usage rights, provided by universities, libraries, institutions, companies and individuals. Moreover, millions of open resources, although not all in the public domain, can be found on YouTube for all aspects of Graphic Arts, mostly uploaded by companies and individuals. For example, a search performed in November 2021 returned 425,000,000 results for the keyword 'printing technology', and 5,320,000 for 'free photoshop tutorials' including 12,800 in the Greek language.

There are also several OER for Graphic Arts studies in the Greek language found in the National Repository of Greek Academic Open Courses (opencourses.gr), developed with the aim of supporting open digital courses offered by higher education institutes all over Greece. Thirteen open courses are hosted in this repository for graphic arts technology, covering prepress, press and postpress topics, and three for graphic design subjects. Moreover, 33 and seven open-access textbooks and learning objects for Printing Technology and Graphic Design, respectively, are hosted at the 'Kallipos' Repository (repository.kallipos.gr), which aims for the organized presentation, storage and long-term preservation of open educational material for the academic and research community. OER are also offered via OpenArchives.gr, the largest portal providing a single point of access to Greek scientific digital content of high quality. Content providers are academic and research institutions, archives, libraries and scientific societies from Greece and Cyprus. Through OpenArchives.gr, users can search for academic grey literature, research articles, books, conference proceedings, archives, etc. Searches with the keywords 'printing technology' and 'graphic design' returned 90 and 129 results respectively; 'history of graphic arts' and 'history of graphic design' 98 and 11 respectively.

3. Research: Awareness and Use of OER by Higher Education Students and Educators within the Graphic Arts Discipline in Greece

Despite the large number of available OER for the Graphic Arts in English and Greek, there is no research evidence that students and educators in Greek higher education are aware of and use such educational resources. This study will therefore address the following research questions (RQs):

RQ1. To what degree are students of higher education Graphic Arts studies in Greece aware of OER and their potential usefulness for their academic discipline?

RQ2. To what degree are educators within higher education Graphic Arts studies in Greece aware of OER and their potential usefulness for their academic discipline?

RQ3. Do Graphic Arts higher education educators in Greece contribute to OER repositories with their own work?

3.1. Research Methodology

3.1.1. Participants and Data Collection

In Greek higher education, Graphic Arts studies are basically offered by two public universities: (a) at an undergraduate level from the Department of Graphic Design and Visual Communication, University of West Attica, created by amalgamation of the previous educational fields of Graphic Design and Graphic Arts Technology, and (b) at a postgraduate level from the Hellenic Open University; Graphic Arts and Multimedia MA, School of Applied Arts. Relevant courses are offered by other public and private universities; however, this study focused on these two, as they are the biggest and oldest for this purpose.

The research was conducted in spring 2021 using two online survey instruments. Participants in this study were students and educators currently studying or teaching, respectively, at the two Greek universities mentioned above. Their participation in the study was voluntary and they were recruited through a variety of university communication channels. Responses were submitted anonymously over an eight-week period from 1 April to 25 May 2021.

The authors made efforts to involve as many educators and students as possible in this research, with constant reminders through the communication channels used; in the end a total of 67 students and nine educators provided responses. Based on a potential response pool of approximately 800 students, the response rate was 8.4%. While this was a relatively low response rate and cannot be considered generalizable to all Graphic Arts students, the demographic elements answered as part of the survey instrument confirmed that there was diversity with respect to gender and level of study (postgraduate and undergraduate). The response rate for educators was 18%, based on a potential response pool of approximately 50 educators. It is acknowledged by the authors that the focal sample does not allow generalization of the findings. However, as this issue has not been studied before, this could contribute to specific trends in population groups and form the basis for more extensive research in this field.

3.1.2. Research Instruments

Two closed-ended questionnaires with 'yes-no', multiple choice, rating scale and Likert scale questions were designed for the purpose of the research, also including open-ended items in cases where it was not requested to limit the options of the participants: one for students (10 closed-ended items and two open-ended), which explored the awareness and use of Open Educational Resources (Appendix A), and one for educators (14 closed-ended items and two open-ended), which, along with awareness and use, explored their intention to contribute to the OER movement with their own work (Appendix B).

The questionnaires were kept short to ensure participation. The content of the items was based on similar surveys conducted in various parts of the world on the impact of OER in higher education [13,15,19,20,24,25]. A pilot survey was used to test the questionnaires before their large-scale distribution.

In both cases, the participants were initially informed on the purpose of the research, the short completion time, and the protection of their personal data. In addition, a definition of OER was provided as well as definitions and examples of the basic types of OER (open courseware, learning modules, open textbooks, streaming video, open access journals, online tutorials and digital learning objects). This strategy was chosen to encourage participation for those unfamiliar with terms and types of OER. Basic demographics followed, collecting gender and the level of education (undergraduate or postgraduate) at which participants studied or taught respectively, to correlate the results with respect to these data.

In addition to demographics, the questionnaires were structured in three sections. For students, the first section included five items (Q1–Q5) that investigated their awareness of and intention to use OER in Graphic Arts; the second section included two items (Q6–Q7) on how to locate OER; and the third section consisted of five items (Q8–12) on participants' perceptions regarding the benefits of and obstacles to OER use in their studies. For educators, the first section included five items (Q1–Q5) on their awareness of and intention to use OER in Graphic Arts teaching; the second section included six items (Q6–Q11) on locating and sharing OER; and the third section included five items (Q12–16) on participants' perceptions of the benefits of and obstacles to using OER in their teaching. Descriptive statistics were used to analyze the quantitative data obtained. This approach was chosen as the study had a specific purpose of investigating a phenomenon in an initial phase. Therefore, summaries of the sample and measures could address the research questions.

3.1.3. Students' Data Analysis

In total, out of the 67 participants, 48 were females (71.6%) and 19 males (28.4%); 19 (28.4%) were enrolled in the undergraduate program at the Department of Graphic Design and Visual Communication of the University of West Attica, and 48 (71.6%) in the Graphic Arts-Multimedia postgraduate program of the Hellenic Open University.

Section 1: Awareness of and Intention to use OER in Graphic Arts

9% of the sample stated that they knew what OER were long before they participated in this survey, 10.4% stated probably, 34.3% possibly, 35.8% probably not, and 10.4% that they did not know. To the next question, 'Have you used Open Educational Resources during your studies?', 32 (47,8%) answered 'Yes' and 35 (52.2%) answered 'No'. The 32 students who stated that they used OER in their studies preferred, from most to least, online tutorials, open textbooks, open access journals, digital learning objects, open courseware, streaming video and learning modules (Figure 1).
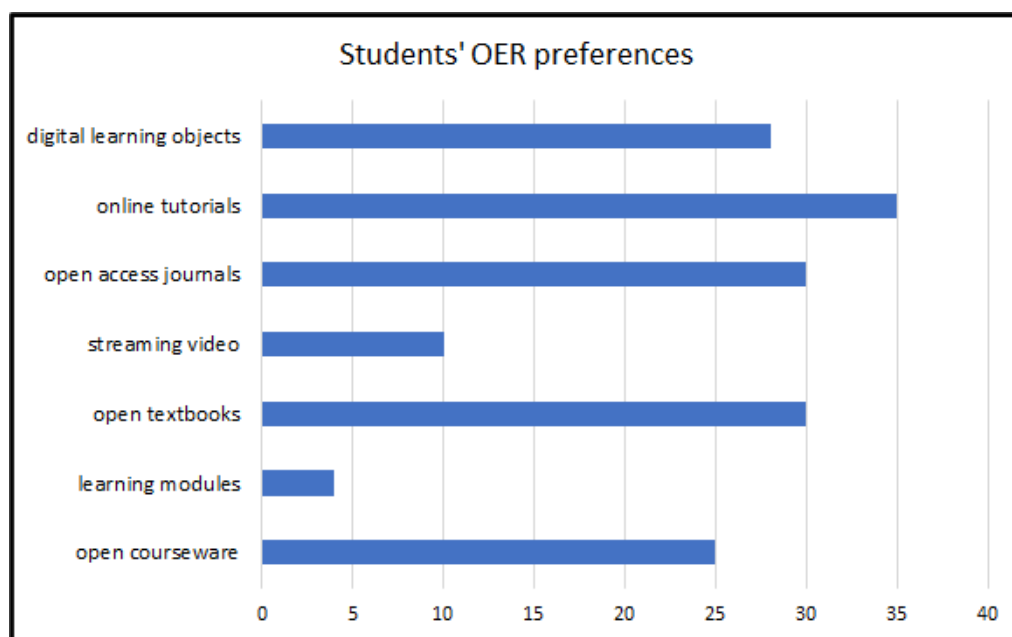

Figure 1. Graphic Arts higher education students: OER preferences.

34 of the 35 students who answered that they did not use OER during their studies stated that they were interested in using them in the future and they were especially interested in online tutorials, open textbooks, and open access journals.

Section 2: Locating OER

In this section of the questionnaire, participants were asked to answer the following two questions: 'In case you use OER in your studies, how do you locate them?' and 'Which of the following OER repositories do you know and/or have you used?' In both questions, participants could select more than one option or even add a new one. The questions were answered by 55 and 56 people, respectively. For the first question 87.3% chose 'Using general purpose search engines', 36.4% 'Using dedicated search engines and Repositories for OER', 43.6% 'Searching at university sites that offer OER', 45.5% 'Following suggestions from the academic staff and the librarians' and 29.1% 'Following suggestions from my fellow students' (Figure 2).

Regarding the OER repositories they knew or had visited, the options were limited to Greek repositories and three of the best-known international ones ('OpenLearn', 'MIT OCW', 'MERLOT' and 'OER COMMONS'). The Greek repositories 'Kallipos' and 'OpenArchieves' received the largest percentages (55.4% and 45.1% respectively). Of the other options, 'OpenLearn' followed with 35.7%, 'MIT OCW' with 19.6% and 'MERLOT' and 'OER COMMONS' with 1.8%.

Section 3: Benefits of and obstacles to using OER

The last section of the questionnaire focused on recording students' views on the benefits that they might gain from OER, but also the obstacles they might face in adopting them in their studies. Initially, the majority of the participants found OER useful for their university studies and they identified the following as the most important benefits, from most to least: 'They are free of cost', 'Their content addresses the educational objectives of

my studies at the university', 'Their content is of good quality (text, image, video, audio, animation, etc.)', 'They include additional resources for the subject they examine (e.g., links to relevant lessons or books)', 'They are offered by a highly recognized educational institution', 'They are complete coursewares with video lectures and additional resources', 'They are offered in modern Greek' (Figure 3).
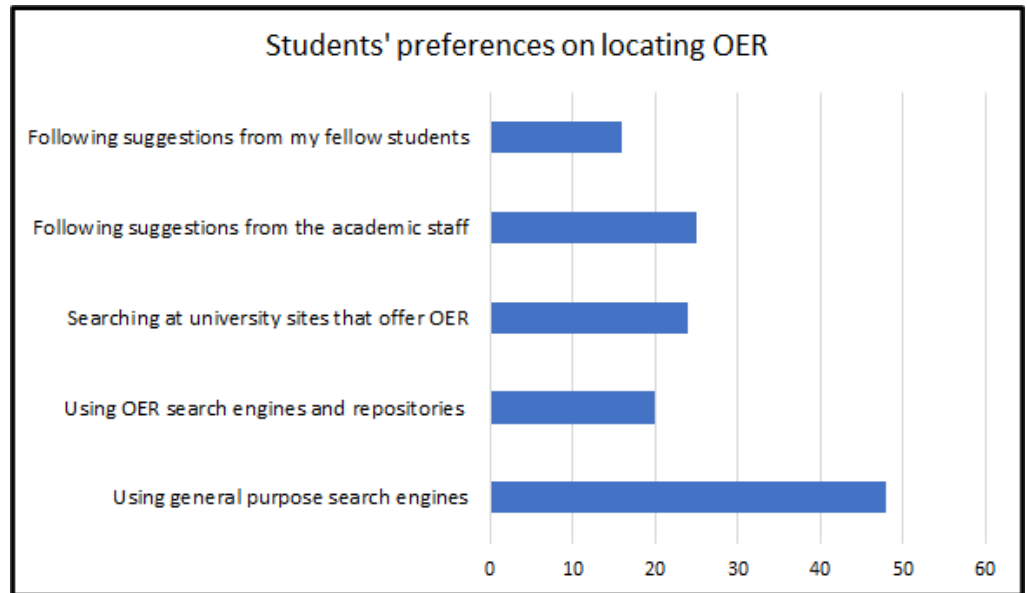

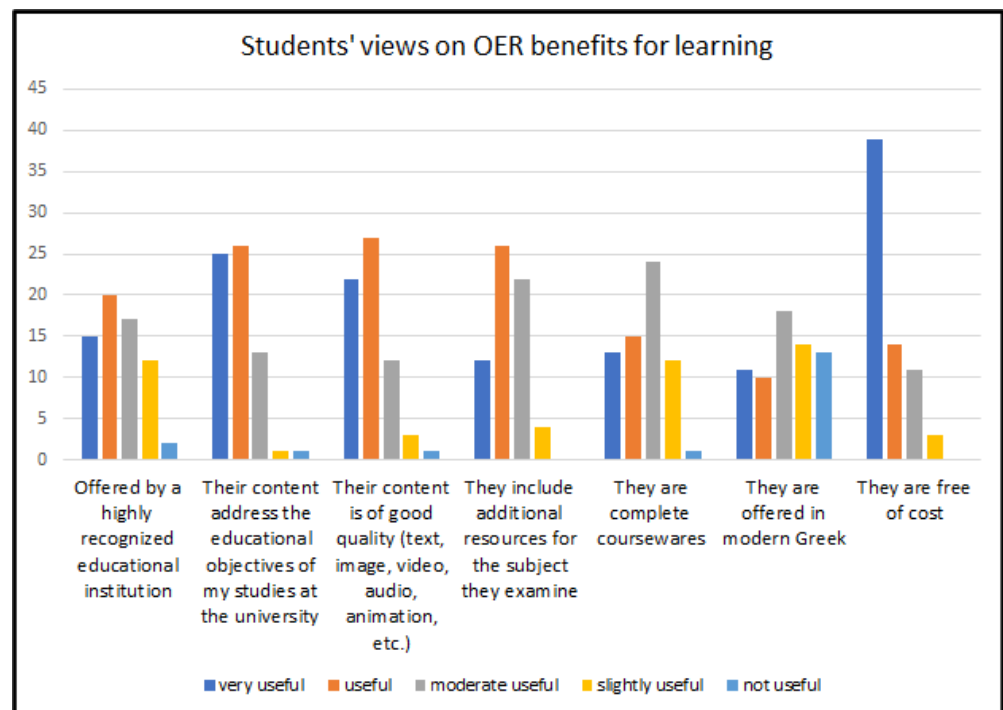**Figure 2.** Graphic Arts higher education students: Locating OER.

Figure 3. Graphic Arts higher education students: OER benefits for learning.

In the open question 'Please write down some reasons for using OER in your studies' 17 participants noted the following:

- It is a way to enhance and expand knowledge
- Comprehensive research

- Immediate and easy access to knowledge
- Free access to knowledge
- Valid, reliable sources of information
- Free lifelong learning
- Non-commercial character
- Bibliographic resources
- Research
- Cross-reference of information
- Wide coverage of a learning subject at no cost
- Important help for the preparation of projects
- Saving money and time on research
- Flexibility and immediacy
- Personal development
- Presentation of contemporary issues
- Necessary resources for lifelong learning

With regard to obstacles to OER adoption, participants identified the following as the most important, from most to least: 'Non-existence of a list with OER for Graphic Arts', 'I do not know enough about OER', 'Finding them is a difficult and time-consuming process', 'Lack of encouragement from the university', 'Limited knowledge of licensing and intellectual property issues of OER', 'Lack of relevant OER on Graphic Arts', 'Most OER are offered in English', 'Reduced technological skills for using OER', 'I am not sure about their quality' (Figure 4).
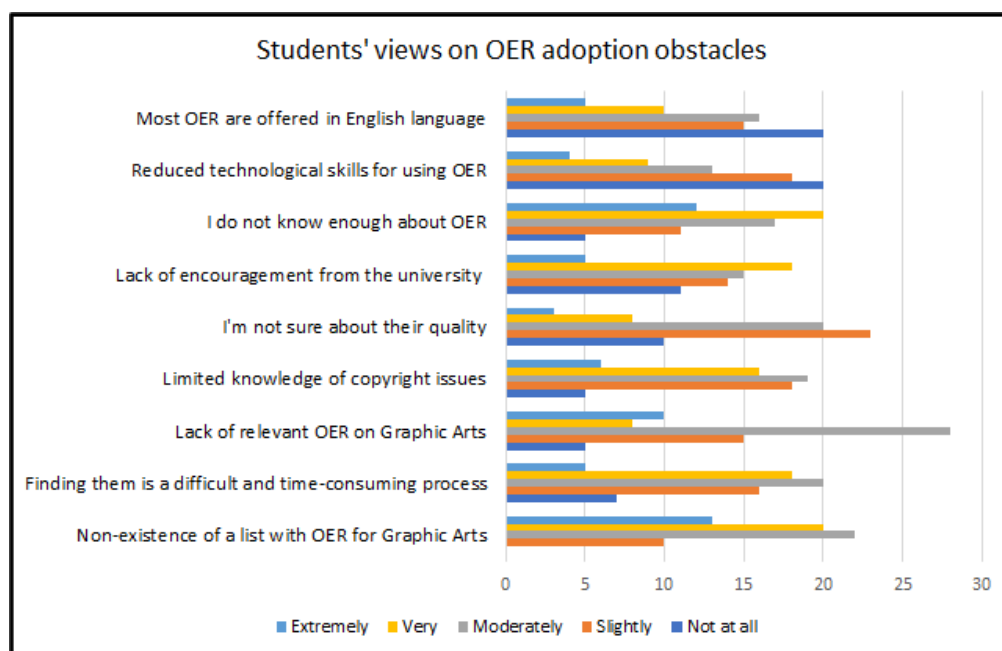

Figure 4. Graphic Arts higher education students: OER adoption obstacles for learning.

The last question of the questionnaire sought students' views on the most important elements that characterize OER. Thirteen answers were returned in this open-ended item, as follows:

- OER offer to all continuous training, innovative proposals and the opportunity to acquire new knowledge.
- OER offer a high level of knowledge related to different scientific subjects.
- OER provide knowledge resources to people who do not necessarily want to acquire a degree or do not have a way of entering higher education.
- Quality, reliability and usefulness of resources.

- Simple and clear, but also detailed when needed.
- Easy and free access.
- Open and directly accessible knowledge.
- Knowledge on demand.
- Overload of material of—sometimes—questionable quality.
- Huge amount of information.
- Time-consuming process.
- Difficulty in finding them.
- Limited offer of complex issues.

The questionnaire ended with a comments/remarks field where two participants noted that (a) 'Not all OER are free, as most MOOC certificates require fees' and (b) 'there are no consistent lists of OER in Greek except for Kallipos'.

Gender correlation showed that males knew of and used OER in their studies less than females (40% and 60% respectively). However, regarding future use, both males and females were willing to use OER in the future. Correlation based on the level of studies (undergraduate or postgraduate) showed that undergraduate students had less knowledge on OER than postgraduate students: almost half of the postgraduate students in this study did not use OER in their studies, while for the undergraduate students this percentage was 70%. More specifically, from the 19 undergraduate students, 6 (31.6%) answered 'Yes' and 13 (68.4%) 'No' to the question 'Have you used OER as an aid to your studies?', while of the 48 postgraduate students, 26 (54.2%) answered 'Yes' and 22 (45.8%) 'No'.

3.1.4. Educators' Data Analysis

Of the nine educators who participated in this study, five were women and four men. All participants taught Graphic Design, Print Technology, History of Graphic Arts and Graphic Design, and other related courses, both at undergraduate and postgraduate levels at the Hellenic Open University and the University of West Attica.

Section 1: Awareness of and intention to use OER for Graphic Arts

Eight out of nine participants stated that they were aware of OER and they usually used for teaching open textbooks, open access journals and digital learning objects such as videos, images, and audio files. Moreover, they were willing to continue doing so in the future.

Section 2. Locating and Sharing Open Educational Resources

Eight out of nine educators stated that they mostly used a general-purpose search engine and specific keywords to locate OER, and to a much lesser extent dedicated search engines and repositories for OER, with 'Kallipos' as the main choice. Moreover, six participants stated that they had shared their work as OER in the Greek repositories 'Kallipos', 'OpenArchives' and 'Open Courses' and they would continue to do so in the future. Two of the remaining three participants stated that they were not willing to share their work in the future, as they want to keep the copyright, and one stated 'I do not know at this time whether I will decide in the future to share my work'.

Section 3. Benefits of and obstacles to using OER for teaching

Seven out of nine participants stated that OER are useful for teaching and the most important issues associated with OER for teaching were, from most to least: 'Reduced costs for students', 'Saving time for preparing teaching material', 'They are offered by highly recognized educational institutions', 'Free access to a large number and range of educational resources', 'OER contribute positively to students' performance and personalized learning'.

Next, to the question 'What do you consider to be the most important obstacles to the adoption of Open Educational Resources in the educational process?', the majority reported as the main obstacles the following: the lack of a list of OER for Graphic Arts, finding them being a difficult and time-consuming process and lack of encouragement to adopt OER by the university.

Correlation analysis was omitted for educators' data, due to the small number of participants.

4. Discussion

In this study, an attempt was made to examine the awareness and use of OER by higher education students and educators within the Graphic Arts discipline in Greece. Although the results of the study cannot be generalized, as the research was conducted for a short time and the sample is limited, they provide evidence to university administration and libraries for encouraging adoption of OER across campus. Analysis of the data collected from the quantitative research provided answers to the research questions as follows:

RQ1. To what degree are students of higher education Graphic Arts studies in Greece aware of OER and their potential usefulness for their academic discipline?

Most of the undergraduate students had little or no knowledge of OER and they had never used any of them in their studies. However, almost all of them stated that they would like to do so in the future. On the other hand, more than half of the postgraduate students stated that they were aware of OER and had used them in their studies. In addition, those who had not used OER expressed a desire to do so in the future. The fact that postgraduate students were more aware of OER is probably related to the experience of a more mature and knowledgeable person, as well as to the research process that postgraduate students practice during their studies, which leads to identifying and utilizing a wider range of resources. However, as OER can improve the educational process, there is a need to inform students of the benefits of using them when they enter university for undergraduate studies. Such a strategy would lead to a better rate of adoption as students proceeded in the educational setting, considering that all students who participated in this study stated their intention to use OER in the future.

Furthermore, the majority of students that were aware of OER used a general-purpose search engine and proper keywords to locate OER, while the most well-known OER repositories were the Greek 'Kallipos' and 'OpenArchieves ' and the international OpenLearn and MIT OCW. Most students considered OER to be very useful for their studies and considered the most important factors for their adoption to include the recognition of the institution that offers them, the relevance of the subject to their studies, the quality of their presentation and the free availability, while few were affected by the fact that many of the resources are offered only in English language. In addition, students stated that the free and easy access to knowledge was important not only in the context of their studies but also for their personal development in lifelong learning. On the other hand, those who had already used OER considered that one of the most important elements that characterizes them, apart from those mentioned as reasons for their adoption, is the offer of a wide range and quality of resources in different scientific subjects which are not always easy to locate. Lack of adequate information on OER is also considered a main obstacle for their adoption. Finally, it is worth noting one of the comments recorded by the students, which was related to the commercial exploitation of OER. For example, in Coursera one can attend a full course free of cost, but a fee is required to obtain a certificate of attendance. The issue of commercial exploitation of OER is very important and needs to be investigated; however, it is beyond the scope of this research.

RQ2. To what degree are educators within higher education Graphic Arts studies in Greece aware of OER and their potential usefulness for their academic discipline?

The majority of the educator participants were aware of OER and utilized them in their teaching. They mostly used open textbooks, open access journals and digital learning objects such as videos, images, and audio files in their teaching. Moreover, all participants stated their intention to use them in the future. However, these results contrast with those of students, especially undergraduates, a majority of whom stated that they had not used OER during their studies. This paradox is probably related to students' vague knowledge of what OER are. At the same time, it is a starting point for further research on how to inform students regarding OER and the benefits for their adoption in the educational process.

For educators, the most popular way to locate OER is a general-purpose search engine using proper keywords, while the most well-known repository was that of 'Kallipos' and less so 'OpenArchives', 'OpenLearn' and the 'MIT OCW'. In addition, most educators

believed that the adoption of OER in the educational process was very useful for the Graphic Arts discipline as it facilitated reduced costs for students, time savings for preparing teaching materials, ease of accessing valuable resources, and opportunities for personalized learning that contribute to the improvement of students' performance. Regarding the obstacles that act as a deterrent to the adoption of OER in the educational process, educators considered the most important to be the non-existence of an exclusive list of OER for Graphic Arts and the lack of encouragement of their use by the university where they teach. Of lesser importance they considered as obstacle the fact that most OER are offered in English without clear licensing and copyright issues.

RQ3. Do graphic arts higher education educators in Greece contribute to OER repositories with their own work?

Most educators freely shared their personal work in Greek repositories and were willing to continue doing so in the future, while those who were not willing to do so argued that the educational material they created is their personal work and they wish to retain all copyright. The fact that educators shared their work as OER in Greek repositories is very important, as they provide open scientific content in the Greek language that Greek students can use without language difficulties. However, students' low awareness indicates that there is more to be done towards communicating educators' OER efforts to students. Moreover, this fact also shows the interest of educators in developing OER in the context of state initiatives such as 'Kallipos', 'OpenArchives' and 'Open Courses'.

The results of this study suggest that it would be particularly important and beneficial for Greek university departments that offer the scientific subject of Graphic Arts to design strategies for the adoption of OER in teaching and learning. These strategies should focus on their importance in education, on ways of finding, retrieving, evaluating, adapting and using them, and on ways to freely share resources created by educators. At time of publication, the library of the University of West Attica had compiled a list of links to educational institution and organizational sites that support Open Access. However, more awareness and information actions are required, a quite difficult task for Greek librarians considering that there is no national strategy for OER in Greece, not even for Open Access (OA), as a recent study from the Academic Libraries and Open Access Books in Europe revealed. Moreover, there are no OA book-specific funds for researchers in Greece other than the 'Kallipos' initiative, and OA books are not included in academic library catalogues [26]. It must be mentioned that the 'Hellenic Academics Library Link' recognizes and endorses various ways of implementing open access (OA), including the development of new OA publishing platforms, archives and repositories [27]. However, public funds play a key role in engaging educators to produce and share their work as OER.

Moreover, the fact that majorities of educators and students stated that one of the main obstacles to the adoption of OER in this discipline is the non-existence of a single access point for Graphic Arts indicates the need for research on the design and development of a constantly updated portal with Graphic Arts OER, categorized into topics covered by the curricula.

5. Conclusions, Limitations and Future Research

To conclude, the present study suggests that although students' awareness of OER was low, the majority of the participants (Greek higher education students and educators in the Graphic Arts discipline) were positive about many aspects of OER. The findings agree with similar research findings that stressed that lack of awareness is the biggest obstacle for the adoption of OER in higher education, especially in countries outside the US [13–17]. However, several reports and studies from the US, international institutions such as UNESCO and other researchers worldwide [7,28–35] provide valuable results and guidelines for the adoption of OER in higher education that the Greek ministry of education, Greek universities and Greek libraries can use as a starting point towards designing OER adoption strategies in higher education.

OER are here and can facilitate free access to knowledge, a basic human right.

'If we want to effectively engage students, we need to make sure that materials are designed to support every learner, that teachers understand how to take advantage of the flexibility of openly licensed resources, and that they are equipped with the knowledge and tools to customize materials for different learners. So, we are not just talking about changing materials, but changing how teaching and learning happen. And schools will need to be prepared to create and sustain conditions that allow teachers, students, and families to fully benefit from OER'. [36]

The findings of this study have generalizability limitations, and hence further research should be conducted. Despite the authors' efforts to increase participation, students and educators of the Graphic Arts discipline were not very keen on remotely completing online questionnaires. Perhaps this attitude is a result of the endless hours of online presence during the pandemic that cause 'screen fatigue' within the educational community. Therefore, another approach could be more beneficial for conducting such research in the future. For instance, to increase participation, researchers could collaborate with educators asking them to distribute such questionnaires in their physical lessons. Moreover, in-depth interviews could add more detailed data to such research.

Overall, our findings seek to contribute to a deeper understanding of the awareness and use of OER by higher education students and educators within the Graphic Arts discipline in Greece. However, due to the limitations of the current study, further experiments are needed to assess the data as valid.

Appendix A. Questionnaire Items for Students

Appendix A.1. Section 1: Q1–Q5 Awareness of and Intention to Use OERs in Graphic Arts

Q1. Did you know what Open Educational Resources (OER) were before you participated in this survey?

- Definitely
- Probably
- Possibly
- Probably Not
- No

Q2. Have you used OER as an aid to your studies?

- Yes
- No

Q3. If yes, what type of OER?

- open courseware
- learning modules
- open textbooks
- streaming video
- open access journals
- online tutorials
- digital learning objects
- all the above
- other (please specify)

Q4. If no, would you be interested in using them in the future?

- Yes
- No

Q5. If yes, what type of OER you would prefer to use in the future?

- open courseware
- learning modules
- open textbooks
- streaming video
- open access journals
- online tutorials
- digital learning objects
- all the above
- other (please specify)

Appendix A.2. Section 2: Q6–Q7 Locating OER

Q6. In case you use OER in your studies, how do you locate them?

- Using general purpose search engines
- Using dedicated search engines and Repositories for Open Educational Resources (e.g., https://www.oercommons.org/, https://opencourses.gr/, https://www.merlot.org/merlot/, accessed on 1 March 2021)
- Searching at university sites that offer OER (e.g., MIT Open Courseware, UK Open University)
- Following suggestions from the academic staff and the librarians
- Following suggestions from my fellow students
- Other (please specify)

Q7. Which of the following OER repositories do you know and/or have you used?

- OpenLearn
- MIT OCW
- MERLOT
- OER COMMONS
- Open Courses (opencourses.gr)
- OpenArchives (OpenArchives.gr)
- Kallipos (repository.kallipos.gr)
- Other > please specify

Appendix A.3. Section 3: Q8–Q12 Benefits of and Obstacles to Using OER

Q8. Which of the following issues associated with OERs do you consider the most important for learning?

- They are offered by a highly recognized educational institution
- Their content addresses the educational objectives of my studies at the university
- Their content is of good quality (text, image, video, audio, animation, etc.)

- They include additional resources for the subject they examine (e.g., links to relevant lessons or books)
- They are complete coursewares with video lectures and additional resources
- They are offered in modern Greek
- They are free of cost

Q9. How useful do you think are OER to your studies?

- Very useful
- Useful
- Moderately useful
- Slightly useful
- Not useful

Q10. Please write down some reasons for using OER in your studies.

Q11. What do you consider to be the most important obstacles to the adoption of OER in your studies?

- Non-existence of a list with OER for Graphic Arts
- Finding them is a difficult and time-consuming process
- Lack of relevant OER on Graphic Arts
- Limited knowledge of licensing and intellectual property issues of OER
- I am not sure about their quality
- Lack of encouragement from the university
- I do not know enough about OER
- Reduced technological skills for using OER
- Most OER are offered in English language

Q12. Please write down your opinion on the most important elements that characterize OER.

- Comments

Appendix B. Questionnaire Items for Educators

Appendix B.1. Section 1: Q1–Q5 Awareness and Intention to Use OER for Graphic Arts

Q1. Did you know what Open Educational Resources (OER) were before you participated in this survey?

- Definitely
- Probably
- Possibly
- Probably Not
- No

Q2. Have you used OER as an aid to your teaching?

- Yes
- No

Q3. If yes, what type of OER?

- open courseware
- learning modules
- open textbooks
- streaming video
- open access journals
- online tutorials
- digital learning objects
- all the above
- other (please specify)

Q4. If no, would you be interested in using them in the future?

- Yes
- No

Q5. If yes, what type of OER you would prefer to use in the future?

- open courseware
- learning modules
- open textbooks
- streaming video
- open access journals
- online tutorials
- digital learning objects
- all the above
- other (please specify)

Appendix B.2. Section 2. Q6–Q11 Locating and Sharing OER for Graphic Arts

Q6. In case you use OER in your teaching, how do you locate them?

- Using general purpose search engines
- Using dedicated search engines and Repositories for Open Educational Resources (e.g., https://www.oercommons.org/, https://opencourses.gr/, https://www.merlot.org/merlot/, accessed on 1 March 2021)
- Searching at university sites that offer OER (e.g., MIT Open Courseware, UK Open University)
- Following suggestions from the academic staff
- Following suggestions from my fellow students
- Other (please specify)

Q7. Which of the following OER repositories do you know and/or have you used?

- OpenLearn
- MIT OCW
- MERLOT
- OER COMMONS
- Open Courses (opencourses.gr)
- OpenArchives (OpenArchives.gr)
- Kallipos (repository.kallipos.gr)
- Other > please specify

Q8. Have you shared educational material you created for Graphic Arts as OER?

- Yes > If yes, please specify the location
- No

Q9. If yes, would you continue doing so in the future?

- Yes
- No

Q10. If no, do you plan to do so in the future?

- Yes
- No

Q11. If no, why do you not intend to share your work as OER?

- I want to keep the copyright of my work
- I do not believe in free access to knowledge
- I do not know at this time whether I will decide in the future to share my work
- Other > Please specify

Appendix B.3. Section 3: Q12–Q16 Benefits and Obstacles Using OER for Tecahing

Q12. Which of the following issues associated with OER do you consider the most important for teaching purposes?

- Reduced costs for students
- Saving time for preparing teaching material

- Free access to a large number and range of educational resources
- OER contribute positively to students' performance and personalized learning
- They are offered by highly recognized educational institutions

Q13. How useful do you think OER are for teaching?

- Very useful
- Useful
- Moderately useful
- Slightly useful
- Not useful

Q14. Please write down the reasons for using OER in teaching.

Q15. What do you consider to be the most important obstacles to the adoption of OER in teaching?

- Non-existence of a list with OER for Graphic Arts
- Finding them is a difficult and time-consuming process
- Lack of relevant OER on Graphic Arts
- Limited knowledge of licensing and intellectual property issues of OER
- I am not sure about their quality
- Lack of encouragement from the university
- I do not know enough about OER
- Reduced technological skills for using OER
- Most OER are offered in English

Q16. From your experience so far please write down your opinion on the most important elements that characterize OER for teaching and learning.

- Comments

Thank you for participating in this survey.

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