

Undergraduate and master's theses in open access at University of Rijeka

Mirko Duić

University of Zadar, Department of Information Sciences, Zadar, Croatia
miduic@unizd.hr

Abstract - The goal of this paper was to research different aspects of open access undergraduate and master's theses, available in digital repository of the University of Rijeka. Research data were analyzed with regard to the fields of science and institutions within which theses were created, as well as with regard to the dates of their publishing. Research data were acquired using the quantitative content analysis of the data from the repository. It was found out that 38.7% of documents in the repository are undergraduate theses (8827 documents) and about 39% of documents are master's thesis (8902 documents). About 20% of undergraduate theses and 25% of master's thesis are published as 'open access' documents, which means that anybody can read them. The percentage of OA theses defended from 2016 to 2021 is increasing. However, there are not many OA theses which were created in the year 2015 and before. There are large variations in the percentages of OA theses created at different institutions within the university. For example, at the Faculty of Humanities and Social Sciences almost all theses are published in open access, while at Faculty of Economics and Business there is no theses published in open access.

Keywords - open access; undergraduate & master's theses

I. INTRODUCTION

Students and professors, scientists and professionals, they all have various analog and digital sources through which they can get to the necessary information. Among digital sources of information, scientific journals are valuable and often used source. Institutional repositories are also often used. Institutional repositories offer access to digital documents and their long term preservation. Documents in institutional repositories were made as a result of scientific, intellectual and creative activities of a particular institution [1]. Many documents stored in institutional repositories are available as open access documents (OA documents), which means that free access through the web, access without payment and other barriers, is provided to these documents so that users can read, download, distribute or use in other legal ways OA documents in repository [2].

There are many benefits of providing open access documents in the repository, documents such as undergraduate and graduate student theses: the visibility of OA documents is increased, as well as the number of citations of these documents; better transparency of an institution's activities; encouraging the sharing of scientific information. Also, documents could be better protected and preserved for a long time [1]. Also, repositories with many OA documents are used for presentation and promotion of an institution's educational and research activities [3]. There are also some potential

disadvantages of providing OA documents in the repository. The problem with OA master's theses found in repositories could be their unequal quality. In addition, sometimes master's theses could contain sensitive content to which not everyone should have access [3, 4]. OA documents could be at greater risk of plagiarism [4]. Finally, when building an open access repository the intellectual property rights could be problematic - not all students need to approve the use of their undergraduate and master's theses in open access [3].

Some authors think that undergraduate and master's thesis, as well as other similar works, need to be published as open access documents by default, so that they can be accessed and used by anybody and not just by users of the particular institution [3]. Macan points out that a combination of many activities is needed for the creation of successful digital repositories. In addition to the promotion of open access and digital repositories, and the development of various useful functionalities of repositories, the institution may prescribe the obligation that authors must store their works in an institutional repository (obligation of self-archiving) [5]. Conversely, Hawkins, Kimball and Ives are writing against institutional policies 'that require students to submit theses and dissertations to electronic institutional repositories', if they want to graduate [6, p.32]. Their research findings indicate that many universities and libraries in the United States, exert pressure on students to publish their final theses in the repository. Although these authors support open access principles and practice, they think that it is unethical to force or manipulate 'students into giving up rights to their intellectual property' [6, p.33].

II. INSTITUTIONAL REPOSITORIES IN CROATIA AND OPEN ACCESS

In a paper from 2007, Krajna states that the first institutional repositories in the Croatian higher education system were repositories of Faculty of Mechanical Engineering and Naval Architecture, School of Medicine, Faculty of Humanities and Social Sciences, Faculty of Economics and Business, all four within the University of Zagreb [7]. Hebrang Grgić and Barbarić wrote that in April 2010 in Croatia only 'five institutional repositories had a tendency to be OA repositories', but 'only one of them completely fits the definition of OA repositories' [8, p.156]. Using the survey method they explored what academic librarians in Croatia think about OA institutional repositories. Over 90% of respondents thought that it is necessary to establish a digital repository at their institution and that this should be an OA repository [8]. In a paper from 2015, Vrana has described his research in which 26 academic librarians at University of Zagreb

were surveyed. Research findings indicate that in repositories of their institutions the following types of content were available: doctoral dissertations, journal papers, book chapters, and undergraduate and master's theses. The vast majority of respondents believe that open access to scientific information is important for the success of the repository [9]. In a paper from 2016 Hebrang Grgić wrote that university librarians should include topics about open access in educational programs about information literacy, because students are not very familiar with that concept [10]. Stone and Lowe advise librarians to make students more knowledgeable about OA topics before the final part of their studies, so that they get to know the advantages of OA publication. Thus, they will make more informed decisions about publishing of their theses [11].

This kind of education became especially important for Croatian university students and professors, after the Croatian national repository Dabar was initiated in 2015. Within the Dabar repository, each higher education institution can create its own local repository free of charge. Students and employees of the institution can store different types of documents in that repository and they can choose different levels of access to those documents, including the open access. Dabar was built by the University Computing Center of the University of Zagreb (SRCE), in cooperation with the academic and research community in Croatia [12]. SRCE aimed to build a platform that would allow 'institutions in the science and higher education system to easily build secure, reliable and interoperable institutional repositories' [12, p.149].

Growth in the number of OA documents in the Dabar repositories depends to a large extent on the authors of the papers. It depends, for example, on how many students will decide to publish their undergraduate and master's theses in open access. Students determine under which of the following conditions they will publish their work in the Dabar repository: 1) Open access - the work is available to everybody; 2) Institutional access - the work is available only to students and employees of the institution; 3) Restricted access - the work is available to all members of the scientific community in Croatia; 4) Embargoed access - only basic information about work and abstract are available in repository, and whole work will be available in repository after a certain specified date; 5) Closed access - only basic information about work and abstract are available in repository [4].

There are more and more open access documents in the Dabar repositories every year. In 2016, a year after the creation of the Dabar system, there were 46% of OA documents, while in 2020 there were already 51%, and in 2021 as many as 61% [13]. SRCE, which has built the Dabar repository system, continuously encourages institutions and individuals to publish content in open access [2]. For example, in 2021, at the e-Infrastructure Days - SRCE DEI 2021 conference, repositories of Dabar system were awarded for promoting open access. Among the winners was the Repository of the Faculty of Humanities and Social Sciences, University of Rijeka [13]. Among the winners was also the Repository of the Juraj Dobrila University of Pula, the university where students are obliged to publish undergraduate and master's

theses in open access, if they want to receive a certificate of completion of studies [14].

III. RESEARCH

The research goal of this study was to research different aspects of undergraduate and master's theses in open access, available in digital repository of the University of Rijeka. In order to acquire data about these aspects, quantitative content analysis method was used. Publicly available data about documents in the repository of University of Rijeka were collected on January 20, 2022 from the same repository. Three variables were used in the analysis: year of undergraduate and master's thesis defence, field of science in which thesis was created, institution of the University of Rijeka within which thesis was created. Additionally, the data about documents in repositories of the following Croatian universities were acquired to find out how many undergraduate and master's theses they contain and how many of these theses are published in open access: Juraj Dobrila University of Pula, Josip Juraj Strossmayer University of Osijek, University of Split, University of Zagreb, University of Zadar. That way we could compare availability of open access theses at these universities and provide a context and more complete understanding of the main research topic - availability of open access theses in repository of the University of Rijeka. This data was also collected on January 20, 2022 from the repositories of listed universities.

IV. FINDINGS

A. Comparison of OA theses in university repositories

In Table 1. we can see percentages of open access undergraduate and master theses in repositories of the following Croatian universities: Juraj Dobrila University of Pula (UNIPU), Josip Juraj Strossmayer University of Osijek (UNIOS), University of Split (UNIST), University of Zagreb (UNIZG), University of Zadar (UNIZD), University of Rijeka (UNIRI).

Among these universities the repository of the Juraj Dobrila University of Pula has the highest percentage of open access theses - there are 2499 undergraduate theses in open access or 99.6% of the total number of undergraduate theses in the repository. There are 1203 master's theses in open access or 99.8% of the total number of master's theses in the repository. Repository of the University of Rijeka has the lowest percentage of open access theses - there are 1712 undergraduate theses in open access or 19.4% of the total number of undergraduate theses in the repository and there are 2155 master's theses in open access or 24.2% of the total number of master's theses in the repository.

TABLE I. TO WHAT EXTENT STUDENTS PUBLISH OPEN ACCESS THESES, CONSIDERING THE UNIVERSITY

University	Undergraduate theses		
	All undergrad. theses	OA undergrad. theses	Percentage of OA undergrad. theses
UNIPU (Pula)	2510	2499	99.6%
UNIOS (Osijek)	10640	6083	57.2%
UNIST (Split)	7623	3584	47%

UNIZG (Zagreb)	20501	9139	44.6%
UNIZD (Zadar)	1826	665	36.4%
UNIRI (Rijeka)	8827	1712	19.4%
University	Master's theses		
	All master's theses	OA master's theses	Percentage of OA master's theses
UNIPU (Pula)	1205	1203	99.8%
UNIOS (Osijek)	10974	6306	57.5%
UNIST (Split)	6644	3639	54.8%
UNIZG (Zagreb)	38505	19516	50.7%
UNIZD (Zadar)	2798	925	33.1%
UNIRI (Rijeka)	8902	2155	24.2%

B. Repository of the University of Rijeka

Repository of the University of Rijeka contains 22806 documents, of which 33% are in open access. Of the total number of documents in the repository, 8827 are undergraduate theses (38.7%) of which 1712 are in open access - therefore, there are 19.4% open access undergraduate theses in relation to the total number of undergraduate theses in the University of Rijeka repository. Also, of the total number of documents in this repository, 8902 are master's theses (39%) of which 2155 are in open access - therefore, there are 24.2% open access master's theses in relation to the total number of master's theses in the repository.

Undergraduate theses in the repository are available under the following conditions, i.e. access categories: institutional access ('institucijski pristup', translation into Croatian), open access ('otvoreni pristup'), closed access ('nedostupan rad'), restricted access ('autoriziran pristup'), embargoed access ('privremeno nedostupan rad'). In the access category 'institutional access' there are 5451 theses out of a total of 8827 undergraduate theses (61.8%). Institutional access means that the document is available only to students and employees of the institution. In the access category of 'open access' there are 1712 undergraduate theses or 19.4% of undergraduate theses. Open access means that the work is available to everybody. In the access category 'closed access' there are 1516 undergraduate theses or 17.2%. Closed access means that only the basic information about work and abstract are available in the repository. In the access category 'restricted access' there are 147 undergraduate theses or 1.7%. Restricted access means that the work is available to all members of the scientific community in Croatia. Finally, only one undergraduate thesis is in access category 'embargoed access'. This means that only the basic information about work and abstract are available in the repository, and the complete thesis will be available in repository after a certain specified date.

Master's theses in the repository are available under the following access categories. In the access category 'institutional access' there are 6479 master's theses out of a total of 8902 master's theses (72.8%). In the access category of 'open access' there are 2155 theses or 24.2% of master's theses. In the access category 'closed access' there are 137 master's theses or 1.5%. In the access category 'restricted access' there are 109 master's theses

or 1.2%. There are 22 master's thesis in access category 'embargoed access' (0.25%).

C. Analysis of OA theses based on the year of creation

In Table 2 it is visible that the repository of the University of Rijeka has 1203 undergraduate theses created in 2021. This is 13.6% of the total number of undergraduate theses in the repository. 359 out of these 1203 undergraduate theses or 29.8%, were published as open access theses. There are 1550 undergraduate theses defended in 2020 in the repository (17.6% of the total number of undergraduate theses in the repository). 386 out of these 1550 undergraduate theses or 24.9%, were published as open access theses (OA theses). The number of undergraduate theses from 2019 (1572 theses) and 2018 (1565) in the repository is very similar to the total number of papers from 2020 (1550). However, percentages of undergraduate theses in open access for 2019 (13.9%) and 2018 (14.7%) are significantly lower than for 2020 (24.9%). The repository has even fewer OA undergraduate theses created in 2017 and 2016 (13.7% and 12.9%, respectively). From these data it can be concluded that the number of OA undergraduate theses created from 2016 to 2021 is continuously growing. Particularly significant increase of the number of theses could be noticed for undergraduate theses created in 2020, compared to undergraduate theses created in 2019 (24.9% compared to 13.9%, respectively). However, there is one exception. The situation with the undergraduate theses created in 2015 differs from this trend of annual growth of the number of undergraduate theses, considering that in the repository there are significantly fewer theses defended in 2015 than there are theses created in the following years. In the repository there are only 296 undergraduate theses created in 2015. 162 out of these 296 undergraduate theses or 54.7%, were published as OA theses. This is a convincingly larger share of OA theses than in all subsequent years. However, although the share of OA undergraduate theses is significantly higher than in subsequent years, the total number of undergraduate theses created in 2015 is significantly lower than in subsequent years.

TABLE II. TO WHAT EXTENT STUDENTS PUBLISH OPEN ACCESS UNDERGRAD. THESES, CONSIDERING THE YEAR OF THESES CREATION

Year of theses creation	All undergrad. theses	OA undergrad. theses	Percentage of OA undergrad. theses
2021	1203	359	29.8%
2020	1550	386	24.9%
2019	1572	219	13.9%
2018	1565	230	14.7%
2017	1366	187	13.7%
2016	1269	164	12.9%
2015	296	162	54.7%
2014	5	4	80%
2011	1	1	100%

In Table 3 it is visible that the repository has 1109 master's theses created in 2021. This is 12.5% of the total number of master's theses in the repository. 410 out of

these 1109 master's theses or 37%, were published as OA theses. There are 1394 master's theses created in 2020 in the repository (15.7% of the total number of master's theses in the repository). 492 out of these 1394 master's theses or 35.3%, were published as OA theses. Also, from Table 3 it is visible that the number of master's theses created in 2019, 2018, 2017 and 2016, which are in the repository, is very similar to number of master's theses created in 2020. In addition to that fact, we can see that there is a continuous growth of the share of OA master's theses from 2017 to 2020. This growth is especially noticeable for the year 2019 in relation to the year 2018 - 27% and 17.4%, respectively, as well as for the year 2020 in relation to the year 2019 - 35.3% and 27%, respectively.

TABLE III. TO WHAT EXTENT STUDENTS PUBLISH OPEN ACCESS MASTER'S THESES, CONSIDERING THE YEAR OF THESES CREATION

Year of theses creation	All master's theses	OA master's theses	Percentage of OA master's theses
2021	1109	410	37%
2020	1394	492	35.3%
2019	1435	388	27%
2018	1446	252	17.4%
2017	1373	191	13.9%
2016	1403	214	15.3%
2015	589	199	33.8%
2014	57	6	10.5%
2013	33	0	0%
2012	30	1	3.3%
2011	19	0	0%

D. Analysis of OA theses based on the field of science

In Table 4 it is visible that the repository has 969 undergraduate theses which were created in the field of humanistic sciences (11% of the total number of undergraduate theses in the repository). As many as 963 out of these 969 undergraduate theses or 99.4%, were published as OA theses. This is by far the largest share of OA undergraduate theses compared to shares of OA theses from other fields of science. For example, in second place in terms of the share of OA undergraduate theses are OA theses from the interdisciplinary areas of knowledge - 47%. Then follows the field of biomedicine and health with 46.7% of OA undergraduate theses, and the field of biotechnical sciences with 33.1% of OA theses. Apart from this group of scientific fields with a high share of OA undergraduate theses, the remaining scientific fields have a low share of OA undergraduate theses available in the repository. For example, there are only 5.9% OA undergraduate theses from the field of social sciences - only 189 OA theses out of 3196 undergraduate theses from that field. The situation is similar for undergraduate theses in the field of technical sciences, of which there are 3500 in the repository, but only 150 undergraduate theses or 4.3%, were published in open access, which means that 3350 theses are not available in open access. In the field of natural sciences, the repository has 241 undergraduate theses, of which only two have been published in open access.

TABLE IV. TO WHAT EXTENT STUDENTS PUBLISH OPEN ACCESS UNDERGRADUATE THESES, CONSIDERING THE FIELD OF SCIENCE

Field of science	All undergrad. theses	OA undergrad. theses	Percentage of OA undergrad. theses
Humanistic sciences	969	963	99.4%
Interdisciplinary areas of knowledge	217	102	47%
Biomedicine and healthcare	600	280	46.7%
Biotechnical sciences	118	39	33.1%
Social sciences	3196	189	5.9%
Technical sciences	3500	150	4.3%
Natural sciences	241	2	0.8%
Field of art	5	5	100%
Interdisciplinary fields of art	1	1	100%

In Table 5 it is visible that the repository has 834 master's theses from the field of humanistic sciences (9.4% of the total number of master's theses in the repository). As many as 825 out of these 834 master's theses or 98.9%, were published as OA theses. There are 404 master's theses from the interdisciplinary areas of knowledge (4.5% of the total number of master's theses in the repository). 175 out of these 404 master's theses or 43.3%, were published as OA theses. There are 232 master's theses from the field of biotechnical sciences. 63 out of these 232 master's theses or 27.2%, were published as OA theses. Compared to that, there are 33.1% OA undergraduate theses in the field of biotechnical sciences. The majority of master's theses in the repository are from the field of social sciences - 3725 theses out of a total number of 8902 theses in the repository (41.9%). 582 out of these 3725 master's theses or 15.6%, were published as OA theses. This is a significant increase in the share of OA master's theses compared to the share of OA undergraduate theses in the field of social sciences, which was only 5.9%. There are 14 OA master's theses from the field of natural sciences (9% of all master's theses from that field). Next are master's theses from the field of technical sciences of which there are 2225 or 25% of the total number of master's theses in the repository. However, only 68 or 3.1%, were published as OA theses.

TABLE V. TO WHAT EXTENT STUDENTS PUBLISH OPEN ACCESS MASTERS' THESES, CONSIDERING THE FIELD OF SCIENCE

Field of science	All master's theses	OA master's theses	Percentage of OA master's theses
Humanistic sciences	834	825	98.9%
Interdisciplinary areas of knowledge	404	175	43.3%
Biomedicine and healthcare	1443	543	37.6%
Biotechnical sciences	232	63	27.2%
Social sciences	3725	582	15.6%
Natural sciences	156	14	9%
Technical sciences	2225	68	3.1%

Field of art	1	1	100%
--------------	---	---	------

Faculty of Economics and Business	1425	0	0%
-----------------------------------	------	---	----

E. Analysis of OA theses based on the institution within which the thesis originated

Availability of undergraduate theses in the repository of University of Rijeka is visible in Table 6. It is presented with consideration of the institution within which the thesis originated. It can be seen from the table that the repository has the most undergraduate theses made within the Faculty of Humanities and Social Sciences - 1089 theses or 12.3% of the total number of undergraduate theses in the repository. As many as 1073 out of these 1089 theses or 98.5%, were published as OA theses. There are 214 undergraduate theses made within the Faculty of Teacher Education (2.42% of the total number of undergraduate theses in the repository). 114 out of these 214 theses or 53.3%, were published as OA theses. Following institutions also have a large share of OA undergraduate theses: Department of Informatics (116 OA theses - 48.5%), Faculty of Health Studies (234 OA theses - 47.6%), Faculty of Medicine (53 OA theses - 48.5%), Department of Biotechnology (41 OA theses - 35.7%). These institutions are followed by institutions with significantly lower shares of OA undergraduate theses. For example, there are 1333 undergraduate theses made within the Faculty of Maritime Studies. Only 72 out of these 1333 theses or 5.4%, were published as OA theses. Although this institution publishes a large number of undergraduate theses, it has a very small share of them published in open access. The situation is even more unfavorable at the Faculty of Engineering, which has 1551 undergraduate theses in the repository of which only two theses have been published in open access. In this group also belong Faculty of Tourism and Hospitality Management which has 1234 undergraduate theses in the repository and only one is in open access, as well as the Faculty of Economics, which has 1425 undergraduate theses in the repository, but none of which is in open access.

TABLE VI. TO WHAT EXTENT STUDENTS PUBLISH OPEN ACCESS UNDERGRADUATE THESES, CONSIDERING THE INSTITUTION

Institution	All undergrad. theses	OA undergrad. theses	Percentage of OA undergrad. theses
Faculty of Humanities and Social Sciences	1089	1073	98.5%
Faculty of Teacher Education	214	113	53.3%
Department of Informatics	239	116	48.5%
Faculty of Health Studies	492	234	47.6%
Faculty of Medicine	138	53	38.4%
Department of Biotechnology	115	41	35.7%
Faculty of Maritime Studies	1333	72	5.4%
Faculty of Engineering	1551	2	0.13%
Faculty of Tourism and Hospitality Management	1234	1	0.08%

Next, we will present availability of master's theses in the repository of University of Rijeka, based on the institutions within which the theses originated. The repository has the most master's theses made within the Faculty of Humanities and Social Sciences - 1199 theses or 13.5% of the total number of master's theses in the repository. As many as 1183 out of these 1199 theses or 98.7%, were published as OA theses. There are 228 master's theses made within the Department of Informatics (2.6% of the total number of master's theses in the repository). 95 out of these 228 master's theses or 41.7%, were published as OA theses. Following institutions also have considerable shares of OA master's theses: Faculty of Teacher Education (163 OA theses - 42.5%), Faculty of Health Studies (146 OA theses - 38.6%), Faculty of Medicine (439 OA theses - 37.7%), Department of Biotechnology (59 OA theses - 26.5%). These institutions are followed by institutions with significantly lower shares of OA master's theses: Department of Mathematics (6 OA theses or 7.5% OA theses, Department of Physics (4 OA theses - 5.9%), Faculty of Maritime Studies (44 OA theses - 5%), Faculty of Law (19 OA theses - 3.4%). There are 971 master's theses made within the Faculty of Engineering. Only three out of these 971 master's theses or 0.3%, were published as OA theses. There are 1043 master's theses made within the Faculty of Tourism and Hospitality Management. Only one out of these 1043 master's theses or 0.1%, was published as OA thesis. Also, there are 356 master's theses made within the Faculty of Tourism and Hospitality Management, but there is not a single master's thesis published in open access. A similar situation is found at the Faculty of Economics and Business. There are 1380 master's theses made within that institution (15.5%), of which none is published in open access.

V. CONCLUSION

In this study, different aspects of open access undergraduate and master's theses, available in digital repository of the University of Rijeka, were explored.

It was found out that the majority of documents in repository are undergraduate and master's theses. There are 1712 undergraduate theses in open access or 19.4% of the total number of undergraduate theses in the repository and there are 2155 master's theses in open access or 24.2% of the total number of master's theses. The majority of theses are published as 'institutional access' documents, which means that they are available only to students and employees of the institution at which they were created. Also, the percentages of open access theses vary considerably among constituent institutions of University of Rijeka. For example, there are institutions with almost all theses published in open access, and there are institutions that have none or only a few of theses published in open access. The question could be asked: Why there are not more theses published in open access so that anybody can read them? One factor which has an

important influence on percentage of OA theses in the repository is university policy regarding the publishing of documents in the repository. This policy is indicated in the document entitled 'Guidelines for work in the repository of constituents of the University of Rijeka', which contain guidelines for institutions within university, such as faculties and departments [16]. The repository of the University of Rijeka consists of the repositories of these constituent institutions. The guidelines state that undergraduate, master's and doctoral theses must be stored in a digital repository of each constituent institution of University of Rijeka. Also, the guidelines state that each university's constituent institution is publisher of theses and 'independently decides about the visibility of undergraduate, master's and doctoral theses which are in the repository' [16, p.3]. It also states: 'Works can be published in whole or in part, the decision is made by each constituent institution separately, as well as the method of regulating the right to publish digital content' [16, p.3]. Each constituent institution, whether it is a faculty, department, or some other type of university institution that has its own repository, can define the policy related to these issues. Therefore, a certain institution can define the policy that determines that all its theses should be published in open access. For example, the Faculty of Humanities and Social Sciences (FHSS) requires that when submitting the thesis to the secretary office, a student should fill in and sign 'the statement on storage of the undergraduate/master's thesis in the digital archive of the library of the Faculty of Humanities and Social Sciences in Rijeka' [17, 18, p.1]. By signing this statement student confirms that he/she agrees that thesis will be publicly available. That's why at FHSS 98.5% of undergraduate theses and 98.7% of master's theses are published in open access. However, considering the research finding that, except FHSS, no other institution within University of Rijeka has more than 54% of OA undergraduate theses and more than 41.7% of OA master's theses in the repository, it can be concluded that other institutions within university don't have requirement that their students publish theses in open access. Institutions either leave that decision to the students and mentors, or they can even have a policy which prohibits publishing of the student's theses in open access.

In conclusion, it can be said that students' theses in open access are definitely a valuable part of educational and scientific infrastructure and that there should be more of them available at University of Rijeka, as well as at other Croatian universities. Various ways to increase their number should be explored, described and used. However, it is important to note that there is no straightforward answer to the question of whether students should be obliged to publish their theses in open access. There are arguments for and against this approach, therefore this issue is open for discussion. Education of students about open access and arguments for its use, promotion of open access by librarians and professors, could be effective ways to increase the number of OA theses in repositories. Further research and discussions about this topic are needed so that students, mentors, repository and university administrators, could consider the best possible solutions.

REFERENCES

- [1] Nacionalni repozitorij završnih i diplomskih radova ZIR. Za studente, Retrieved February 1, 2022. from <https://zir.nsk.hr/za-studente>
- [2] Dabar. Pravilnik sustava Dabar, Retrieved February 1, 2022. from <https://dabar.srce.hr/files/dabar-pravilnik-v1.0-20150817.pdf>
- [3] J. Schopfel, S. Vanacker, E. Kergosien and B. Jacquemin, "Master's theses and open scholarship: a case study," *Digital Library Perspectives*, vol. 34 (4), pp. 276-287, 2018.
- [4] P. Horvat, "Zastupljenost otvorenog pristupa završnim radovima u digitalnim repozitorijima hrvatskih veleučilišta na nacionalnom repozitoriju ZIR," *Zbornik radova Veleučilišta u Šibeniku*, vol. 1-2, pp. 129-137, 2020.
- [5] B. Macan, "Važnost obveza samoarhiviranja radova u otvorenom pristupu za uspješnost digitalnih repozitorija," in 14. dani specijalnih i visokoškolskih knjižnica - Knjižnične zbirke i usluge; knjižnice i istraživački podatci; pozicioniranje knjižnica i knjižničara. Lovran, Hrvatska, 13.-16.05.2015. Zagreb: Hrvatsko knjižničarsko društvo, 2017, pp. 154-168. Manuscript accepted for publishing.
- [6] A. R. Hawkins, M. A. Kimball and M. Ives, "Mandatory open access publishing for electronic theses and dissertations: Ethics and enthusiasm," *The Journal of Academic Librarianship*, vol 39 (1), pp. 32-60, 2013.
- [7] T. Krajna, "Slobodan pristup informacijama: institucijski repozitoriji," *Polimeri: časopis za plastiku i gumu*, vol. 28(3), pp. 199-200, 2007.
- [8] I. Hebrang Grgic and A. Barbaric, "The future of open access in Croatia: a survey of academic and research libraries," *Library review*, vol. 60 (2), pp. 155-160, 2011.
- [9] R. Vrana, "Digitalni repozitoriji znanstvenih informacija u knjižnicama visokoškolskih ustanova Sveučilišta u Zagrebu," *Vjesnik bibliotekara Hrvatske*, vol. 59 (3-4), pp. 265-300, 2016.
- [10] I. Hebrang Grgic, "Information literacy and open access in Croatian academic libraries," *Library review*, vol. 65 (4-5), pp. 255-266, 2016.
- [11] S. M. Stone and M. S. Lowe, "Who is citing undergraduate theses in institutional digital repositories? implications for scholarship and information literacy," *College & Undergraduate Libraries*, vol. 21 (3-4), pp. 345-359, 2014.
- [12] D. Celjak, Z. Bekić, Lj. Jertec, M. Milinović and D. Ulamec, "Dabar-sustav digitalnih repozitorija: iskorak prema sustavnoj brizi za digitalnu imovinu akademske zajednice u Hrvatskoj," *Arhivi, knjižnice, muzeji*, vol. 18, pp. 148-165, 2015.
- [13] Dabar. Dodjela priznanja repozitorijima u Dabru za promicanje otvorenog pristupa, Retrieved February 1, 2022. from <https://dabar.srce.hr/2021-05-05/dodjela-priznanja-repozirorijima-u-Dabru-za-promicanje-otvorenog-pristupa>
- [14] Digitalni repozitorij Sveučilišta Jurja Dobrile u Puli. Upute za pohranjivanje radova, Retrieved February 1, 2022. from <https://repozirorij.unipu.hr/2018-09-05/upute-za-pohranjivanje-radova>
- [15] Repozitorij Sveučilišta u Rijeci. Statistika objava, Retrieved February 3, 2022. from <https://www.unirepository.svkri.uniri.hr/stats/object>
- [16] Repozitorij Sveučilišta u Rijeci. Smjernice za rad u repozitorijima Sveučilišta u Rijeci, Retrieved February 5, 2022. From https://www.unirepository.svkri.uniri.hr/sites/www.unirepository.svkri.uniri.hr/files/ctools/160317_smjernice_za_rad_u_repozirorijima.pdf
- [17] Filozofski fakultet - Odluka o predaji završnih i diplomskih radova u elektroničkom obliku, Retrieved February 5, 2022. from <https://www.ffri.uniri.hr/files/studentidokumenti/2014-09-08%20-%20Predaja%20radova%20u%20elektroničkom%20obliku.pdf>
- [18] Filozofski fakultet - Izjava uz predaju završnih i diplomskih radova u elektroničkom obliku, Retrieved February 5, 2022. from <https://www.ffri.uniri.hr/files/studentidokumenti/2014%20-%20Izjava%20oko%20završnih-diplomskih%20radova.doc>