

How faculty from Pula, Dubrovnik, Varaždin, Koprivnica and Osijek use Web-based scientific literature: analysis based on their age, gender, field of science and literature exchange practices

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Abstract - The research goal of this paper was to explore the use of web sources of scientific literature by members of the faculties from universities in Croatian cities of Pula, Dubrovnik, Varaždin, Koprivnica and Osijek. The questionnaire was sent to members of the faculties and their answers were analyzed with regard to these variables: age and gender of respondents; their practices of exchanging scientific literature; field of science in which they are working. It was found out that the most frequent users of Croatian web portals are participants from the field of humanities, participants of older age and female participants. The most frequent users of foreign web portals are participants from the field of social sciences and female participants, while participants of all ages use them equally. The most frequent users of pirate web portals are participants from the field of humanities, while participants of both genders use them equally. The Croatian web portal Hrčak is very frequently used by almost all participants from the field of humanities, about half of participants from the field of social sciences and only about one third of participants from the field of technical sciences.

Keywords - digital library, faculty, web sources of scientific literature, Sci-Hub, universities, Google Scholar, Hrčak

I. INTRODUCTION

An essential condition to reach teaching and research quality is that teachers and researchers have access to a sufficient number of quality texts. They use various types of texts in their work, especially papers from scientific journals and books. Each year number of these texts grows very fast. For example, in the year 2004 there were 2000 scientific publishers from the field of technology, medicine and natural sciences who published about 1.2 millions of reviewed papers [1]. In 2011 there were around 3500 scientific publishers and at least 27000 scientific journals [2]. Before the advent of personal computers and internet, university teachers and researchers have primarily used printed literature. However, the situation is quite different today. Changes caused by the use of digital communication technologies have led to a situation where one can talk about change of the communication paradigm [3]. Many faculty members now also use e-literature which they can find on the web. Today, there are many new ways to find and access digital

texts. They could be found, read or downloaded by using international search engines such as Google Scholar [4] or by using national web portals such as Hrčak in Croatia [5]. Scientists could also become members of academic social networks, for example, ResearchGate [6] or Academia.edu [7]. They could ask other scientists to send them emails with the texts they need. Web and related digital technologies have opened many ways for scientists to find and read the literature which they need. There is even a possibility to access literature by using hidden libraries, i.e., digital pirate libraries, for example, Sci-hub [8] and Library Genesis [9]. These libraries contain millions of scientific papers and books which are accessed by many people from all parts of the world.

II. INFORMATION PRACTICES AND LITERATURE IN DIGITAL ENVIRONMENT

It is not surprising that many scientists have changed their habits of looking for literature. For example, majority of Slovenian scientists, especially younger ones, prefer digital literature. Older Slovenian scientists equally often use digital and printed literature. It was also found in this study that in their research papers more than half of study participants cite texts which have digital origins [10]. In a study by Steinerova it was confirmed that Slovakian scientists often use electronic literature sources. Participants also talked about gaps in information infrastructure, about 'gaps between the information needs of scholars and access to information and funding' [11]. In a study written by Duić, Konjevod and Grzunov, the research goal was to explore the extent to which faculty at the University of Zagreb (Croatia) use various Web sources of scientific literature. Research findings clearly indicated that literature from Web sources is highly used by scientists. Google Scholar is the most popular Web source. It was also established that many Croatian scientists very often use portal Hrčak, Directory of open access journals, ResearchGate and Academia.edu. About one fifth of participants very often use pirate web portals Sci-Hub and Library genesis. They use them for the following reasons: texts are not available in other ways; legally available texts are expensive; ease of access. The huge majority of participants is dissatisfied with offer of international scientific journals and papers which are

available in Croatia [12]. This finding indicates the problem of securing the availability of scientific literature. In a study written by Zubac and Tominac it is emphasized that Croatian higher education institutions do not have enough financial resources for payment of expensive subscriptions for printed and electronic scientific journals [13]. This unfavourable situation is also confirmed in a study written by T. Krajna and H. Markulin. After exploring library budgets at the University of Zagreb they found out that the majority of libraries do not have enough financial resources for acquiring scientific literature. Croatian *Ministry of science and education* has co-financed literature procurement, but as support of *Ministry* gradually declined, libraries had to reduce their subscriptions to international scientific journals [14]. However, Croatian scientists have one huge open access source of literature: web portal Hrčak that was created in 2006. Hrčak offers easy tools for publishers of Croatian scientific journals to publish their journals on the web and in open access. The significance of this portal could be confirmed by the fact that 485 journals and 198452 scientific and professional papers were freely available on this portal in January 17, 2019 [7]. Open access policy and movement are answers to very high prices of subscriptions for scientific databases owned by large international publishers. The huge growth of open access movement is confirmed by the fact that the web portal *Directory of open access journals* includes 12422 journals from 129 countries. In these journals there were about 3.68 millions of scientific papers in January 17, 2019 [15].

III. RESEARCH METHODOLOGY

The research goal was to explore the faculty' use of web sources of scientific literature in relation to four variables: age of study participants; gender of participants; field of science in which they are working (social sciences, humanities, technical sciences); their practices of exchanging scientific literature (how often participants ask authors to send them their published texts). The questionnaire was published on the web in the second part of December 2018. Thereafter, the invitation to complete the questionnaire was sent to all employees with teaching and research responsibilities at the three Croatian universities: Juraj Dobrila University of Pula (located in the city of Pula) [16], University North (located in cities of Varaždin and Koprivnica) [17], University of Dubrovnik (located in the city of Dubrovnik) [18]. The invitation was also sent to employees of the four departments of the J. J. Strossmayer University of Osijek (located in the city of Osijek) [19]. Invitation e-mails were sent to 923 faculty employees of these four universities: 173 e-mails for employees in Pula, 123 e-mails for employees in Dubrovnik, 251 e-mails for employees in Varaždin and Koprivnica and 376 e-mails for employees in Osijek. By the beginning of January 2019, the questionnaire was completed by 116 employees of these universities, which work primarily in social sciences, technical sciences and humanities. The survey for this research paper was anonymous, so that participants could more freely give answers about their practices and opinions. Through this research many findings were acquired, however, only part of these findings is presented and analyzed in the paper: there was not enough space to

present all findings, therefore, the focus of the paper was on the four aforementioned variables.

IV. FINDINGS

There are about 63% of female participants among 116 participants who answered the questionnaire. The majority of study participants are 40 to 49 years old (about 35%). The majority of study participants are working in the field of social sciences - about 34%. There are about 20% of participants from the field of technical sciences and about 14% of participants from the field of humanities. The questionnaire was filled by about 22% of participants who work at the university in Pula, about 20% of participants who work at the university in Dubrovnik, about 16% of participants who work at the university in Varaždin and Koprivnica, and about 37% of participants who work at the university in Osijek.

A. Analysis based on variable: field of science

In Table 1 the research results are presented in relation to the following fields of science in which study participants are working: humanities (13.8% or 16 respondents), technical sciences (19.8% or 23 respondents) and social sciences (33.6% or 39 participants).

In the first line of Table 1, the frequency of their Google Scholar use for access to scientific literature is presented. Participants gave grades from 1 to 5 for this and other statements in the questionnaire. Grades 1 and 2 denote that they never or almost never use Google Scholar, while grades 4 and 5 denote that they often or very often use Google Scholar. The same meaning of these grades applies to all survey statements that are presented in the following text.

Answers to the first question already indicated differences in behavior between participants from different scientific fields. There are 59% of participants from the field of social sciences and about 56% of participants from the field of humanities who often or very often use Google Scholar, in relation to about 39% of participants from the field of technical sciences. In the second line of Table 1, participants' use of portal ResearchGate is presented. There are about 31% of participants from humanities, 48% of participants from the field of technical sciences and about 54% of participants from the field of social sciences who often or very often use this portal. In the third line of Table 1, participants' use of Croatian portal Hrčak is presented. About 81% of participants from humanities often or very often use this portal, in relation to about 69% of participants from the field of social sciences. Only about 26% of participants from the field of technical sciences, often or very often use Hrčak. In the fourth line of Table 1, we can see how often participants ask authors to send them their published texts. Participants from the field of humanities most frequently engage in this activity. There are about 31% of these participants who often or very often ask authors to send them their texts. They are followed by participants from the field of social sciences (about 26%), while the least inclined to engage in this activity are participants from the field of technical sciences (about 17%).

In the last lines of Table 1, the results are presented about how often study participants use three different types of web portals to access scientific literature: Croatian portals, foreign portals and pirate portals. In the seventh line of Table 1, participants' use of Croatian web portals is presented. They are mostly used by participants from the field of humanities - about 94% of those participants use them often or very often, in relation to 59% of participants from the field of social sciences who often or very often use these portals. A surprising fact is that Croatian portals are often or very often used by only about 30% of participants from the field of technical sciences. In the eighth line of Table 1, the results are presented about how often participants use foreign web portals. They are mostly used by participants from the field of social sciences - about 92% of these participants use them often or very often, in relation to about 65% of participants from the field of technical sciences and about 63% of participants from the field of humanities. In the ninth line of Table 1, the results are presented about how often participants use pirate web portals. They are mostly used by participants from the field of humanities - about 38% of them use them often or very often, in relation to about 26% of participants from the fields of social sciences and technical sciences.

TABLE I. PARTICIPANTS' ANSWERS IN RELATION TO THE FIELD OF SCIENCE IN WHICH THEY ARE WORKING

	Humanities		Technical sciences		Social sciences	
	Sources of literature		Sources of literature		Sources of literature	
	grade 1 & 2	grade 4 & 5	grade 1 & 2	grade 4 & 5	grade 1 & 2	grade 4 & 5
Google Scholar	25%	56.3%	21.7%	39.1%	15.4%	59%
Research Gate	37.5%	31.3%	26.1%	47.8%	23.1%	53.9%
Hrčak	12.5%	81.3%	21.7%	26.1%	12.8%	69.2%
Request to auth.	43.8%	31.3%	43.5%	17.4%	48.7%	25.6%
Request to pers. in Cro.	50%	12.5%	47.8%	13.1%	66.7%	18%
Req. to persons from ab.	56.3%	18.8	60.87%	8.7%	76.9%	7.7%
Croatian web por.	0%	93.8%	39.1%	30.4%	15.4%	59%
Foreign web por.	25%	62.5%	8.7%	65.2%	0%	92.3%
Pirate web por.	43.8%	37.5%	43.5%	26.1%	64.1%	25.6%

grade1 = never, gr. 2 = almost never, gr. 4 = often, gr. 5 = very often

B. Analysis based on variable: age

In Table 2 the research results are presented in relation to the age of study participants. The answers of study participants who don't have more than 39 years of age are presented, in relation to the answers of study participants who are 40 years old and older. There are 43 participants (37.1%) who don't have more than 39 years, and there are 60 participants (60.3%) who are 40 years old and older. There are no age data for 13 participants (11.2%).

In the first line of Table 1, the frequency of their Google Scholar use for access to scientific literature is presented. About 46% of younger participants (up to 39 years of age) often or very often use this portal, in relation to about 50% of the older participants (40 years old and older). In the second line of Table 2, participants' use of portal ResearchGate is presented. About 46% of younger participants often or very often use this portal, in relation to 51% of older participants. In the third line of Table 2, participants' use of Croatian portal Hrčak is presented. Older participants are significantly more frequent users of Hrčak. There are about 58% of them who often or very often use this portal, in relation to 42% of younger participants. In the fourth line of Table 2, we can see how often study participants ask authors to send them their published texts. Older participants are significantly more frequent in this activity - about 33% of them often or very often ask authors for texts, in relation to about 19% of younger participants. Conversely younger participants are more often asking texts from people from Croatia who are not authors, but who have these texts. In the fifth line of Table 2, the results are presented about how often participants ask persons from Croatia who are not authors of requested texts, to send them these scientific texts. About 19% of younger participants often or very often ask for texts, in relation to about 10% of older participants.

TABLE II. PARTICIPANTS' ANSWERS IN RELATION TO THEIR AGE

	Participants who don't have more than 39 years		Participants who are at least 40 years old	
	Sources of lit.		Sources of lit.	
	grade 1 & 2	grade 4 & 5	grade 1 & 2	grade 4 & 5
Google Scholar	18.6%	46.5%	27.2%	50%
ResearchGate	25.6%	46.5%	24.3%	51.4%
Hrčak	23.3%	41.9%	14.3%	58.6%
Request to authors	55.8%	18.6%	50%	32.9%
Request to per. in Cr.	60.5%	18.6%	65.7%	10%
Req. to per. from abroad	67.5%	16.3%	65.7%	10%
Sci-Hub	39.5%	44.2%	69.6%	17.2%
Library Genesis	58.14%	18.6%	70%	14.3%
Croatian web portals	27.9%	41.9%	20%	60%
Foreign web portals	4.7%	76.7%	5.7%	77.2%
Pirate web portals	39.5%	44.2%	58.6%	21.4%

grade1 = never, gr. 2 = almost never, gr. 4 = often, gr. 5 = very often

In the sixth line of Table 2, the results are presented about how often study participants ask persons from abroad who are not authors of requested texts, to send them these texts. About 16% of younger participants often or very often ask for texts, in relation to about 10% of older participants. In the seventh line of Table 2, the results are presented about how often participants use Sci-Hub, pirate web containing millions of scientific papers. Younger participants are considerably more frequent users

- about 44% of them use it often or very often, in relation to about 17% of older participants. In the eighth line of Table 2, the results are presented about how often participants use another pirate web portal: Library Genesis, the portal containing millions of scientific books. Younger participants are also more frequent users of this portal - about 19% of them use it often or very often, in relation to about 14% of older participants.

In the last lines of Table 2, the results are presented about how often younger and older participants use three different types of web portals to access scientific literature: Croatian, foreign and pirate portals. In the ninth line of Table 2, participants' use of Croatian web portals is presented. They are mostly used by older participants - about 60% of those participants use them often or very often, in relation to about 42% of younger participants. In the tenth line of Table 2, the results are presented about how often participants use foreign web portals. They are used equally frequent by older and younger participants: 77% of older and younger participants use them often or very often. In the eleventh line of Table 2, the results are presented about how often participants use pirate web portals. They are mostly used by younger participants - about 44% of them use them often or very often, in relation to about 21% of older participants.

C. Analysis based on variable: gender

In Table 3 the research results are presented in relation to the gender of study participants. There were 62.9% or 73 female participants and 35.3% or 41 male participants. In the first line of Table 3, the frequency of Google Scholar use for access to scientific literature is presented.

TABLE III. PARTICIPANTS' ANSWERS IN RELATION TO THEIR GENDER

	Woman		Man	
	Sources of literature		Sources of literature	
	grade 1 & 2	grade 4 & 5	grade 1 & 2	grade 4 & 5
Google Scholar	19.2%	57.5%	31.7%	31.7%
ResearchGate	26%	52.1%	22%	43.9%
Hrčak	16.44%	63%	22%	31.7%
Croatian web portals	20.6%	61.7%	29.3%	36.6%
Foreign web portals	5.5%	82.2%	4.9%	65.9%
Pirate web portals	53.4%	30.1%	46.4%	31.7%

grade1 = never, gr. 2 = almost never, gr. 4 = often, gr. 5 = very often

Female participants are considerably more frequent users of Google Scholar - about 58% of them often or very often use it, in relation to about 32% of male participants. In the second line of Table 3, participants' use of portal ResearchGate is presented. Female participants are also more frequent users of this portal - about 52% of female participants often or very often use ResearchGate, in relation to about 44% of male participants. In the third line of Table 3, participants' use of portal Hrčak is presented. Female participants are considerably more frequent users.

Hrčak is used often or very often by 63% of female participants, in relation to about 32% of male participants.

In the last lines of Table 3, the results are presented about how often male and female participants use three different types of web portals to access scientific literature: Croatian portals, foreign portals and pirate portals. In the fourth line of Table 3, use of Croatian web portals is presented. They are mostly used by female participants - about 62% of female participants use them often or very often, in relation to about 37% of male participants. In the fifth line of Table 3, the results are presented about how often participants use foreign web portals. They are also considerably more often used by female participants - about 82% of female participants use them often or very often, in relation to about 66% of male participants. In the sixth line of Table 3, the results are presented about how often participants use pirate web portals. They are used equally frequent by male and female participants: about 30% of participants of both genders use them often or very often.

D. Analysis based on variable: practices of scientific literature exchange

In Table 4 the research results are presented in relation to the frequency with which study participants are asking authors to send them their texts. In "Part 1a" and "Part 1b" of Table 4, there is a presentation of the characteristics and answers of study participants who almost never or never ask authors to send them their texts. There are 50.9% of participants in this group, i.e., 50 participants who gave grades 1 or 2, as an answer to the question about how often they ask authors to send them their texts. In "Part 2a" and "Part 2b" of Table 4, there is a presentation of the characteristics and answers of study participants who often or very often ask authors to send them their texts. There are 20.7% of participants in this group, i.e., 24 participants who gave grades 4 and 5, as an answer to the question about how often they ask authors to send them their texts.

In "Part 1a" of Table 4, there is a presentation of characteristics of study participants who never or almost never ask authors to send them their texts: they are mostly female - about 66%. About 32% of these participants are in the field of social sciences, 12% are in the field of humanities and 17% are in the field of technical sciences. In "Part 2a" of Table 4, there is a presentation of characteristics of participants who often or very often ask authors to send them their texts: they are mostly female - about 67%; about 42% are in the field of social sciences, 21% are in the field of humanities and about 17% are in the field of technical sciences. These findings indicate that, with regard to the field of science, there are some differences in characteristics of participants who never or almost never ask authors to send them their texts, in relation to characteristics of participants who often or very often ask authors to send them their texts. However, there are no considerable differences with regard to gender between these two groups of participants, because we found almost the same proportion of female and male participants in both groups.

TABLE IV. PARTICIPANTS' ANSWERS IN RELATION TO THEIR PRACTICES OF EXCHANGING SCIENTIFIC LITERATURE

	Part 1a. Participants who never or almost never ask authors to send them their published texts		Part 2a. Participants who often or very often ask authors to send them their published texts	
	Participants' characteristics		Participants' characteristics	
Woman	66.1%		66.7%	
Man	33.9%		33.3%	
Social sciences	32.2%		41.7%	
Humanities	11.9%		20.8%	
Technical sciences	17%		16.7%	
	Part 1b. Sources of literature		Part 2b. Sources of literature	
	grade 1 & 2	grade 4 & 5	grade 1 & 2	grade 4 & 5
Google Scholar	28.8%	50.8%	25.1%	54.2%
ResearchGate	39%	39%	12.5%	66.7%
Sci-hub	66.1%	28.8%	50%	37.5%
Croatian web portals	20.3%	55.9%	29.2%	50.1%
Foreign web portals	6.8%	72.9%	4.2%	91.7%
Pirate web portals	55.9%	28.8%	45.8%	41.7%

grade 1 = never, gr. 2 = almost never, gr. 4 = often, gr. 5 = very often

In "Part 1b" and "Part 2b" of Table 4, there is a presentation of answers of participants about the use of different web portals. Participants who never or almost never ask authors to send them their texts are using Google Scholar and foreign web portals with the similar frequency with which these portals are used by participants who often or very often ask authors to send them their texts.

V. CONCLUSION

Findings indicate that there are some significant differences in using web portals, with regard to various groups of study participants. Here are examples of findings with pronounced differences between groups.

Croatian web portals, for example portal Hrčak, are very frequently used by almost all participants from the field of humanities, almost two thirds of participants from the field of social sciences and only about one third of participants from the field of technical sciences. They are mostly used by older participants and female participants. One of the reasons why Hrčak is often used by participants from the fields of humanities and social sciences could be the fact that almost about 53% of 485 active journals freely available at Hrčak, belong to the fields of humanities (26.4%) and social sciences (26.3%). At Hrčak, there are only 11% of active journals from the field of technical sciences, (January 17, 2019) [5].

Foreign web portals are very frequently used by almost all participants. However, Google Scholar is a popular

foreign portal, which is used in somewhat different pattern than average foreign web portal. Namely, there are about 60% of participants from the fields of social sciences and humanities who often or very often use it, in relation to about 39% of participants from the field of technical sciences. One of the possible reasons why participants from the field of technical sciences considerably less often use Google Scholar could be that they have their specialized international web portals so they have less need to use web portal of general type, such as Google Scholar.

Foreign web portals are mostly used by female participants - about 82% of female participants use it often or very often, in relation to about 66% of male participants. It is interesting to note that among foreign web portals the social networks for scientists - ResearchGate and Academia.edu - are often used, especially ResearchGate.

Finally, there are also some considerable differences in the frequency of pirate web portals use. These portals are mostly used by participants from the field of humanities - about 38% of them use these portals often or very often, in relation to about 26% of participants from the fields of social sciences and technical sciences. Pirate web portals are mostly used by younger participants - about half of them use them often or very often, in relation to about one fifth of older participants. Interesting fact is that pirate web portals are used equally frequent by male and female participants. This fact is in contrast with findings from previous research in which it was established that female faculty use these portals considerably less often [20].

All these findings about differences among the most frequent users of different types of web portals, could be summarized as follows: a) the most frequent users of Croatian web portals are participants from the field of humanities, participants of older age and female participants; b) the most frequent users of foreign web portals are participants from the field of social sciences and female participants; participants of all ages use them equally; c) the most frequent users of pirate web portals are participants from the field of humanities; participants of both genders use them equally.

The questions that could be raised in future research is: Are there certain stable characteristics related to the use of web-based literature by faculty? For example, this and previous research project have established that the most frequent users of Croatian web portals are participants from the field of humanities, participants of older age and female participants. Is this just a coincidence or is it a stable finding which could be validated by future research using different samples of participants? Also, this and previous research project have established that the most frequent users of foreign web portals are participants from the field of social sciences and female participants. These findings should also be tested by including members of different faculty in future research projects. Also, comparisons between faculty from different countries, based on the research methodology presented in this paper, could be fruitful for further advancement of

understanding information behaviour differences and similarities between various groups of university teachers and researchers.

REFERENCES

- [1] B. C. Bjork, A. Roos, and M. Lauri, "Scientific journal publishing: yearly volume and open access availability." *Information Research*, vol. 14 (1), 2009.
- [2] R. Campbell, "Introduction: overview of academic and professional publishing," in *Academic and professional publishing*, R. Campbell, E. Pentz and I. Borthwick, Eds.. Elsevier, 2012, pp. 1-14.
- [3] R. Vrana, R. "ICT-supported communication of scientists and teaching staff at the Faculty of Humanities and Social Sciences in Zagreb," *New library world*, vol. 111 (9/10), pp. 413-425, 2010.
- [4] Google Scholar. Retrieved January 17, 2019. from <https://scholar.google.hr>
- [5] Hrčak. Retrieved January 17, 2019. from <https://hrcak.srce.hr>
- [6] ResearchGate. Retrieved January 17, 2019. from <https://www.researchgate.net>
- [7] Academia.edu. Retrieved January 17, 2019. from <https://www.academia.edu>
- [8] Sci-Hub. Retrieved January 17, 2019. from <https://sci-hub.tw>
- [9] Library Genesis. Retrieved January 17, 2019. from <http://libgen.io>
- [10] P. Vilar, P. Juznic and T. Bartol, "Information behaviour of Slovenian researchers: investigation of activities, preferences and characteristics," *Information Research*, vol. 20 (2), 2015.
- [11] J. Steinerová, "Perceptions of the information environment by researchers: a qualitative study across disciplines," *Information Research*, vol. 23 (4), 2018.
- [12] M. Duić, B. Konjevod and L. Grzunov, "Web sources of literature for teachers and researchers: practices and attitudes of Croatian faculty toward legal digital libraries and shadow libraries such as Sci-Hub," in *MIPRO 2017 - 40th jubilee international convention*, P. Biljanović, Eds. Rijeka: Croatian Society for Information and Communication Technology, Electronics and Microelectronics, 2017, pp. 930-935.
- [13] A. Zubac and A. Tominac, "Digitalna knjižnica kao podrška sveučilišnoj nastavi i istraživačkomu radu na daljinu: elektronički izvori za elektroničko učenje na hrvatskim sveučilištima," *Vjesnik bibliotekara Hrvatske*, vol. 55 (2), pp. 65-82, 2012.
- [14] T. Krajna and H. Markulin, "Nabava knjižnične građe u visokoškolskim knjižnicama," *Vjesnik bibliotekara Hrvatske*, vol. 54 (3), pp. 21-42, 2011.
- [15] DOAJ. Retrieved January 17, 2019. from <https://doaj.org>
- [16] Juraj Dobrila University of Pula (Sveučilište Jurja Dobrile u Puli). Retrieved January 17, 2019. from <https://www.unipu.hr/>
- [17] University North (Sveučilište Sjever). Retrieved January 17, 2019. from <https://www.unin.hr>
- [18] University of Dubrovnik (Sveučilište u Dubrovniku). Retrieved January 17, 2019. from www.unidu.hr
- [19] J. J. Strossmayer University of Osijek (Sveučilište Josipa Jurja Strossmayera u Osijeku). Retrieved January 17, 2019. from www.unios.hr
- [20] M. Duić, "How faculty from Rijeka and Split use web-based scientific literature: Analysis based on four variables," in *MIPRO 2018 - 41st international convention*, K. Skala, Eds. Rijeka: Croatian Society for Information and Communication Technology, Electronics and Microelectronics, 2017, pp. 675-680.