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Scholarly electronic databases and library & information sciences students in Croatia: motivations, uses and barriers.

Sanjica Faletar Tanacković, Martina Dragija Ivanović and Drahomira Cupar

Introduction. *The study investigated library and information science students' motivations for and experiences with electronic database searching.*

Method. *Data were gathered through a self-administered print survey in May 2014 among undergraduate and graduate library and information science students at three Croatia's state universities.*

Analysis. *Quantitative analysis was conducted on 209 correctly completed questionnaires using the SPSS statistical package. Besides descriptive statistics, Chi-Square tests, T-tests, ANOVA, Mann-Whitney Test and Kruskal Wallis tests were used to test possible differences between the groups in the sample. Statistical difference was tested at the level of 95%.*

Results. *Almost all respondents indicated that they obtained electronic database training at university, but only slightly more than a half think that they are good or very good at searching this source of information. Although the majority of respondents indicated that they are intrinsically motivated to use electronic databases, they reported a more frequent use of Google than electronic databases when writing academic papers. Among the main barriers related to electronic database use respondents reported limited access to databases from home, the habit of using Google when searching for information either for private or academic purposes and difficulties with understanding the language (English) of publications available in databases.*

Conclusion. *The results of the study could be used by university teachers and librarians when organizing their electronic resources, promoting their use and preparing information literacy classes.*

Introduction

The use of electronic resources, especially scholarly electronic databases, is now considered a norm in the academe. However, it seems that in their independent searching for academic assignments students tend to give preference to convenient and least-effort resources ([Connaway et al., 2013](#)) and accept materials of lower quality or reliability if it will save them time ([Catalano, 2013](#)). Costly scholarly databases often remain underused or ignored altogether by today's students, who seem to prefer to do their academic assignments last minute and with the least amount of effort. As a result, academic librarians, who invest large portions of their acquisition budgets for database subscriptions, and university teachers who, together with librarians, provide information literacy training, are more or less dissatisfied with the students' choices of information resources and in particular with the level of their use of electronic scholarly databases ([Thompson, 2003](#); [Urquhart et al., 2005](#); [Van Scoyoc and Cason, 2006](#); [Avdic and Eklund, 2010](#); [Faletar Tanacković, Đurđević and Badurina, 2015](#)).

Although a significant number of scholars investigated the information behaviour of students and in particular their use of electronic resources for academic purposes ([Catalano, 2013](#)), perceptions and uses of electronic databases in particular were rarely studied. In order to bridge the existing gap in the professional literature and to contribute to the understanding of the students' motivation for the use of electronic scholarly databases and the barriers they face in their searching, an exploratory study was launched. Its aim was to explore library and information science (LIS) students' experiences related to the use of electronic databases. The study focused in particular on LIS students, as future information professionals, who are believed to be more information literate than their peers at other academic departments.

Literature review

Findings of some broadly set studies which investigated students' information seeking behaviour in general suggest that a significant proportion of students prefer general search engines over scholarly databases. Students' avoidance of authoritative library resources has been found to be caused by their lack of knowledge about library services, resources and instruction ([Maughan, 1999](#); [Kibirige and DePalo, 2000](#); [deJong and Branch, 2005](#); [Al-Moumen, Morris and Maynard, 2012](#); [Nyamboga *et al.*, 2014](#); [Quadri, Adetimirin and Idowu, 2014](#); [Dukić and Strišković, 2015](#)), their lack of information literacy skills ([Long and Shrikhande, 2007](#); [Head, 2008](#)), their laziness and propensity to plagiarism and procrastination ([Thompson, 2003](#)). Similarly, familiarity and experience with information sources (e.g. knowledge about a resource and sophistication in its finding and use), convenience (accessibility, availability, required effort, ease of use, time constraints) and course requirements, among others, are often indicated as contributing factors to source preference ([George *et al.*, 2006](#); [Dervin and Reinhard, 2007](#); [Lee, Paik and Joo, 2012](#); [Catalano, 2013](#)).

Brown ([2005](#)), for example, found that molecular biology graduates at the University of Oklahoma, USA, rely on the extensive reservoir of information in bioinformatics databases such as Genbank, but they do not fully utilize bibliographic databases although they are within their easy reach. As for LIS majors, O'Farrell and Bates ([2009](#)), for instance, established that LIS majors at the University of Dublin, Ireland, identified websites as their preferred information source, while in a more recent study into the library use of LIS graduate students at the University of Illinois, USA, Tracy and Searing ([2014](#)) found that slightly over 60% of respondents used article databases on a weekly basis or more often. In a Finnish study, Junni ([2007](#)) found that many students did not like using the web for research purposes because they felt they could easily find more reliable scholarly publications in the library databases. Respondents in this study commented on the limited access to full-text articles in the subscription databases. As many as 39% of the respondents also emphasized that, although they had attended a course in information seeking, they would need additional training on using library

databases. Similarly, a study conducted in 2004 at Carnegie Mellon University, USA showed that most graduate students used university library databases (78%) but they thought that the library website was confusing and the relevant databases were hard to find ([George et al., 2006](#)). A recent study among 233 undergraduate students at Yonsei University, Korea, reaffirmed the dominant use of online sources for undergraduate academic tasks (search engines, such as Google, were the most frequently used sources of online information (16.8%) and scholarly online databases were third in frequency of use among online sources (8.3%)) ([Lee, Paik and Joo, 2012](#)). In this study students assessed the search engines as superior in terms of accessibility, coverage, efficiency, familiarity and ease of use. On the other hand, the databases were considered more credible and useful sources of information than the search engines. Also, the databases scored better than the search engines on the criterion of satisfaction and continued use intention.

The literature search suggests that the number of studies that focused explicitly on the students' use of scholarly electronic databases is scarce. Most of them seem to have been conducted in developing countries such as Egypt, Ghana, and Nigeria. The reason is probably the fact that in the academic libraries of economically challenged countries the financial burden of scholarly database subscriptions is much more difficult to justify before financiers. In most of these studies the authors used surveys to explore students' awareness of electronic databases and to identify the frequency of their use ([Catterall and Ibbotson, 1999](#); [Togia and Tsigilis, 2009](#); [Amin, Kaliyadan and Wadani, 2011](#); [Gakibayo, Ikoja-Odongo and Okello-Obura, 2013](#); [Kwadzo, 2015](#)). Only a couple of more in-depth studies were identified.

Faced with a poor use of reference databases at Örebro University in Sweden, Avdic and Eklund ([2010](#)) explored what students experience when they search for information using a university reference database and the teachers' understanding of this experience. With the help of acceptance and use of technology (UTAUT) they surveyed 150 students who were in general positive both about the reference databases and about their abilities to search them. Students thought that there is a difference between Google and the

reference databases and that their papers would be of higher value if they used the reference databases. When asked about barriers related to database searching, the respondents reported that it took them too much time to search this resource, they found articles in English difficult to understand, and it was hard for them to find the relevant articles. On the other hand, the teachers were not as optimistic about students' abilities and they believed that, for example, students think there is not a great difference between Google and the reference databases ([Avdic and Eklund, 2010](#)).

In their study into the patterns of undergraduates' use of scholarly databases in a large US research university, based on a log analysis of database access through University of Michigan Library's federated search engine (Search Tools), Mbabu, Bertram and Varnum ([2013](#)) found that less than a half (42%) of undergraduate students accessed a scholarly database at least once in the Fall semester of 2009. While they tried to link the information literacy curriculum of the library with the studied usage patterns, the authors of this study found that, despite their higher levels of learning and expected sophistication in information seeking skills, juniors and seniors used databases proportionately less than freshmen and sophomores. This is in line with the general findings of Warwick *et al.* ([2009](#)) who found that Information Management undergraduate students demonstrated little progress in the development of expertise in information seeking over the first two years of their degree. When faced with a difficult task requiring complex and varied information search, senior students continued to employ limited strategies and worked out the minimum acceptable material needed to complete the task.

Setting

The study was conducted at three state universities in Croatia (Osijek, Zadar and Zagreb). All three universities are large multidisciplinary state universities offering undergraduate, graduate and postgraduate programs in LIS and many other fields of study (social sciences, humanities, natural and technical sciences etc.).

The oldest and largest LIS department is the one at the Faculty of Humanities and Social Sciences at the University of Zagreb (FHSSUZ), with ca 340 students enrolled into its undergraduate and graduate programs. At FHSSUZ a large, modern library facility has been built recently with flexible learning spaces, modern computer infrastructure and access to a rich print and online collection. Together with other state universities in the country, the University of Zagreb is a member of the national consortium for the acquisition of electronic resources that secures access to over 30 scholarly databases such as Academic Search Complete (EBSCOhost), Thomson Reuters, Current Contents, ERIC etc.

The University of Zadar hosts the youngest LIS department with ca 130 undergraduate and graduate students. Zadar University is dispersed at multiple locations and LIS students most frequently use the campus library, with somewhat inadequate computer equipment. The library is a member of the national consortium and subscribes individually to five databases in the field of humanities and sciences (e.g. JSTORE). It also invests much effort into information literacy training.

At the time of the study, a total of 167 undergraduate and graduate students were enrolled in the LIS program at the Faculty of Humanities and Social Sciences at the University of Osijek (FHSSUO). The LIS students predominantly use the recently refurbished faculty library where, due to limited space, only 80 working places and 34 computers are available for ca 1200 students. This library is also a member of the national consortium and individually subscribes to several databases such as Cambridge Journals, Emerald Insight etc. Although the library offers information literacy training and large amounts of the library budget are set aside for database subscriptions, statistical data ([Gašo, 2016](#)) and fragmentary studies about their use ([Faletar Tanacković, Junušić and Faletar, 2012](#)) show that they are underused.

Research questions

As students advance in their studies their need for academic information becomes more sophisticated. Ideally, the same should apply to their searching strategies and skills. This

study tries to investigate the motivation, perception and some aspects of usage of scholarly electronic databases by LIS students at three Croatia's state universities. The study also seeks to establish if the motivation, perception and use of scholarly electronic databases differs among undergraduate and graduate students, and between academically more successful and less successful students. Although it was planned initially, the role of information literacy (IL) and training has not been investigated in this context because 99% of the respondents reported that they had had a formal training in online information searching and electronic database searching as a part of their introductory courses at undergraduate level.

The study tried to find answers to the following research questions:

- How do LIS students perceive their information literacy skills and how important they think IL is for their academic success?
- How do LIS students perceive scholarly electronic databases?
- How and why do LIS students use scholarly electronic databases in their academic work?
- What barriers do LIS students face when searching scholarly electronic databases and where do they seek help?
- Does the usage of scholarly electronic databases differ between students at different study levels (undergraduate and graduate), and students with different academic success (based on their grade point average)?

Methodology

The study was envisioned as a two-phase triangulated study where data would be gathered with the help of qualitative and quantitative methodology. In this paper only the quantitative part of the study will be reported. In the second phase of the project, which has been slightly delayed due to limited resources, the authors plan to conduct a qualitative study with the help of focus groups in order to look deeper into the students' motivations for and experiences with electronic database use. Ultimately, the authors

hope to understand how to encourage students to use electronic databases more frequently.

Since in the first phase of the study a large number of respondents was to be recruited, a survey by questionnaire was chosen to be the best method for data collection. Data were collected by a self-administered print survey in May 2014. The questionnaire consisted of 17 closed and multiple choice questions and Likert-like scale type of questions. The survey questions (demographic and content), designed to address the research questions, could be grouped into the following thematic sets:

- questions related to demographic information about students;
- questions related to students' information literacy skills and training;
- questions related to the frequency of students' use of scholarly electronic databases;
- questions related to motivation i.e. reasons behind students' use of scholarly electronic databases;
- questions related to barriers faced by students when using scholarly electronic databases; and
- questions related to students' perception of scholarly electronic databases.

The survey was piloted with seven randomly chosen respondents (undergraduate students from the University of Osijek). After this, several minor changes were made, such as the change in the wording of some questions. Print surveys were distributed to students during their classes by several teacher volunteers.

Data were analysed using SPSS software for statistical analysis. Besides descriptive statistics, Chi-Square tests, T-tests, ANOVA, Mann-Whitney Test and Kruskal Wallis tests were used to test possible differences between the groups in the sample. Statistical difference was tested at the level of 95%.

Sample

The study was conducted among undergraduate and graduate students enrolled at accredited LIS programs at three state universities in Croatia (Osijek, Zadar and Zagreb). The questionnaire was filled out by a total of 209 respondents: 38.8% from Osijek, 41.1% from Zadar and 21.1% from Zagreb. Since the total number of LIS students at these universities is estimated at 637, the response rate of 32.81 was achieved. The largest number of respondents were female students (81.3%) and students at undergraduate level (71.8%), which are proportionally representative of the student body investigated. In relation to their academic success, the majority of respondents (62%) fall into the group with the grade point average (GPA) between 3.0 and 3.9. Table 1 shows the distribution of respondents in relation to their general characteristics.

	%
Gender	
Female	81.3
Male	18.7
Study level	
Undergraduate	71.8
Graduate	28.2
Academic success (GPA)	
3.0-3.9	62
4.0-5.0	38
University	
Osijek	38.8
Zadar	41.1
Zagreb	21.1
Total	209 (100%)

Table 1: Respondents by general characteristics

Results

Students' information literacy skills and training

It is important first of all to discuss the students' perception of the importance of information literacy (IL) for their academic success and to inquire about their IL training. A total of 99% of respondents reported that they had received formal training in online information searching, and in particular in scholarly database searching. For 88% of respondents this training had been offered during a specific semester-long course taught at undergraduate level of their study program in LIS, and 12.4% indicated that they had participated in IL training in their academic library. In addition, 12.4% of students indicated that they were self-taught in electronic database searching. This information was verified by inspecting course information from the valid syllabuses in all three departments (Osijek, Zadar, Zagreb). In such courses students are instructed in searching, evaluation and citing information resources (both print and online) and are introduced to academic writing.

Since skills in searching information resources are best developed in practice, respondents were then asked if they had had any academic assignments (essays, term papers, etc.) where they had to search for different information resources on their own. The largest proportion of respondents (40.9%) reported having had four to six such assignments in the previous semester. A total of 25% reported having had one to three, and 34.1% more than seven such assignments.

Students were then asked to assess the importance of information literacy skills (in particular in relation to electronic information) on a scale from 1 through 5 (1-not important at all, 5-very important) for their academic success in general and to self-assess their skills in searching electronic information (both search engines such as Google and electronic scholarly databases) on a scale from 1 through 5 (1-very poor, 5-very good). The majority of respondents (83.7%) believe that information literacy skills are important (34.4%) or very important (49.3%) for their academic success. Only 11.5% indicated that these skills are neither important nor important, and only 4.8% find them not important for their academic success. Upon examination of the responses to this question, no statistically significant differences were identified in relation to the studied variables (level of study, academic success).

As can be seen in Table 2, when assessing their skills in electronic information searching, respondents gave significantly higher values for their Google searching skills than for their skills in searching electronic databases. While 89.4% believe that their Google searching skills are good or very good, a much smaller proportion of respondents (55%) think their skills in searching scholarly databases are at the same level of proficiency. Also, it is interesting to note that as many as 39.6% of respondents believe that their database searching skills are neither poor nor good, while only 9.1% believe this is the case with the Google searching skills. A possible reason why so many respondents gave a neutral answer in relation to electronic database searching was that they do not use them often and therefore could not form an objective opinion about their skills. Upon examining responses to this question, it was established that there were no statistically significant differences in relation to students' academic success or level of study (undergraduate and graduate).

	Very poor	Poor	Neither poor, nor good	Good	Very good
Google searching skills	0%	1.4%	9.1%	52.6%	36.8%
Scholarly database searching skills	0%	5.3%	39.6%	44.9%	10.1%

Table 2: Students' self-assessment of searching skills

While in the quantitative study reported in an Al-Moumen, Morris and Maynard's paper (2012) the majority of students indicated that they were confident about using Internet search engines and highly rated their proficiency in finding suitable resources and using the library's online databases, the majority of participants in the follow-up qualitative study (focus groups) emphasized that they wanted more instruction on the use of databases, the search process in general and effective search strategies. Since several other studies also found that the lack of sophistication in the knowledge of resources and development of searching skills presents a barrier to students' search for information (Armstrong *et al.*, 2001; George *et al.*, 2006; Chu and Law, 2008; Tracy and Searing,

[2014](#)) and that students often overrate their ability to retrieve information ([Catalano, 2013](#)), a follow-up study would benefit from an objective assessment of respondents' database searching skills and an insight into their satisfaction with the amount, format and quality of the received IL training.

These findings also suggest topics for future research into ways in which skills learned at university are used in everyday life. For example, database searching strategies and techniques are applicable in the searching of other information resources (such as Google) and the question is raised whether students recognize that these skills are transferable. A potential reason for this lies in the fact that students see database searching only through the lens of their academic assignments and success and not as a transferable skill, usable in other contexts as well.

Frequency of students' use of library and electronic resources

The study also examined how often students used their academic library (to access its print resources), general search engines (such as Google) and electronic scholarly databases when writing academic assignments. As shown in Table 3, Google is used far more frequently than the other two resources: 53.6% use it always i.e. whenever they have an assignment. Electronic databases, on the other hand, are used least frequently: only 23.1% of respondents use them always when they need to find relevant resources for their academic assignments. These results support findings of several recent studies focused on general information behavior of students in Croatia, where authors established that students use Google and Wikipedia far more frequently than electronic databases ([Bračanov, Golubović and Seiter-Šverko, 2014](#); [Faletar Tanacković, Đurđević and Badurina, 2015](#)). Similarly, a number of international studies ([OCLC, 2002](#); [Lee, Paik and Joo, 2012](#); [Catalano, 2013](#)) reported that college students have identified general search engines and web portals as the first-choice resource for their academic assignments.

Upon examination of responses to this question a statistically significant difference was identified between respondents with different levels of academic success and the use of the academic library ($\chi^2(1, N=209)=4,585$ $p=0,032$). Academically more successful students (GPA 4.0-5.5) use the academic library (its print resources) more frequently than respondents with lower GPA (3.0-3.9). A statistically significant difference was also identified in relation to the use of electronic databases between respondents at different levels of study ($\chi^2(1, N=208)=4,447$, $p=0,034$). Graduate students use scholarly databases more frequently than undergraduate students. This finding is in sharp contrast with the Warwick *et al.* (2009) study in which older students did not demonstrate higher levels of information skills and with Mbabu, Bertram and Varnum's (2013) study in which third and fourth year students used databases less than first and second year students.

	Never	Rarely	Sometimes	Often	Always
Library	0%	5.3%	17.2%	40.2%	37.3%
Google	0%	2.4%	7.7%	36.4%	53.6%
Scholarly electronic databases	2.4%	13.5%	27.4%	33.7%	23.1%

Table 3: Students' use of different information resources for academic purposes

Students' motivation for the use of electronic scholarly databases

When asked about the reasons behind their use of electronic databases, the majority of respondents (58.1%) reported that they use them because they personally believe they should use them since scholarly databases are a high quality information resource (intrinsic motivation). On the other hand, the remaining 41.9% indicated that they use them because they were forced by the teachers who insisted on their use (extrinsic motivation). In response to this question, there were some marked differences between groups of users at different levels of study ($\chi^2(1, N=198)=4.809$, $p=0.028$). Graduate students are more frequently intrinsically motivated to use electronic databases than

undergraduate students. Unsurprisingly, if these results are compared with the responses to the question on the frequency of respondents' use of electronic databases, it could be said that the intrinsic motivation plays a more important role (i.e. it is a stronger motivator): graduate students who are more frequently intrinsically motivated to use electronic databases also indicated that they actually use them more frequently. Similarly, undergraduate students who reported more frequently that they are motivated by external factors (i.e. teachers' request) reported lower intensity of their use.

In order to gain a deeper understanding of their motivation for the use of scholarly databases, respondents were also asked to mark their level of agreement with three statements, on a scale from 1 through 5 (1-fully disagree, 5-fully agree). As shown in Table 4, and in line with their responses in the previous question, students are leaning on to the negative side of the scale in the two statements that refer to extrinsic motivators (teacher's recognition, earning better grades). Only in the first statement, which refers to the perceived inherent quality of the papers available in databases, students are moving from neutral to the slightly positive end.

	Fully disagree	Disagree	Neither agree nor disagree	Agree	Fully agree	Mean
If I use electronic databases, my paper will be better.	5.3%	14.5%	28%	36.2%	15.9%	3.43
If I use electronic databases, I will get a better grade.	13%	19.8%	40.1%	21.7%	5.3%	2.86
My teachers will appreciate me more if I use electronic databases.	14%	27.1%	30.9%	20.3%	7.7%	2.81

Table 4. Statements on students' motivation for the use of databases

Since several other studies have shown that teachers play an important role in students' use of quality information sources ([Tenopir, 2003](#); [Al-Moumen, Morris and Maynard, 2012](#)) and that familiarity with sources is recognized as a contributing factor to source preference ([Brown, 1999](#); [George et al., 2006](#); [Lee, Paik and Joo, 2012](#)), teachers should repeatedly set assignments that encourage students to intensively use electronic databases in order to get fully and truly acquainted with all their features, and ultimately recognize and reward students for their use. Also, these findings suggest that students might use electronic databases more frequently if teachers found ways to make them truly understand why databases are better than Google (intrinsic motivator) and not if they required students to use this resource (extrinsic motivator) without communicating to them clearly the real value of this resource. This issue will also be further investigated in the qualitative study.

Barriers in electronic database searching

One of the research questions that motivated this study was related to the barriers students faced when searching electronic databases. In other words, the authors wanted to identify factors which impede students' use of electronic databases. Respondents reported that their searching of electronic databases was challenged, to the largest degree, by limited access to the electronic databases outside the academic library (e.g. from home) (51.2%), their habit of using Google when searching for information either for private or academic purposes (46.9%) and difficulties in understanding the language (English) of publications available in the databases (45.5%).

Although access to some databases to which academic libraries at the studied universities are subscribed has been made available, through proxy server, to members of the academic community outside of university premises, for some databases restrictions have been imposed by aggregators and they are indeed available only locally on faculty premises. Since earlier studies have shown that students at one of the universities studied in this paper prefer to study at home (94.3%), and much less frequently (35.6%) in their academic library ([Faletar Tanacković, Gašo and Mičunović,](#)

[2015](#)), this problem is further aggravated by the fact that in some of the studied libraries the facilities and computer equipment are inadequate (insufficient number or working places in reading rooms, limited number of computers for library patrons, lack of wireless Internet connection etc.). This could partly explain why students prefer to work from home (familiar working environment, better computers, faster Internet connection etc.) and would maybe use electronic databases more frequently if they could access them from there. The issue of accessibility, in particular relating to the very availability of scholarly databases, the possibility of remote access (from outside library), limited computer equipment and relatively poor Internet connection in libraries (database server connection failures), should be taken into serious consideration in developing countries. Surely, these issues can not be tackled or solved solely by academic librarians, but should be considered at higher levels of university management.

The academic faculty should, however, give special attention to the second reason mentioned above: almost half of the respondents reported having a habit of using Google first and whenever they need some (including academic) information. Although it could be argued that the simplicity of the Google search box is responsible for this, only 25.4% of respondents stated that they find the relevant and quality publications much more easily and faster via Google than in electronic databases. Also, only 13.9% of respondents indicated that electronic databases are too complicated to use. The question that arises here is how do students decide upon the resources they will use? Namely, the authors' teaching experience shows that students do come across some relevant publications when searching Google for academic purposes, , but since they cannot access the full-text, they abandon the search without checking if the publications can be found in the electronic databases. In order to avoid such scenarios, teachers and librarians should collaborate more tightly to provide students with in-depth training in scholarly database searching. This training should be delivered in a variety of formats; i.e. it should be integrated into the lectures but also provided by librarians on an individual and group basis as a regular and pre-scheduled program. However, such training also needs to be available as an on-demand service so that needs of different learners could be catered for. It is believed that only after intensive and repeated first-hand searching experiences

could students familiarize themselves sufficiently with electronic databases to include them into their imaginary fields of preferred information source horizons.

Difficulties in assessing the relevance and the quality of publications accessible in electronic databases and the time-consuming nature of searching these information resources, which also rank relatively high among the identified barriers (Table 5), are most probably associated with the language problem. If students have problems understanding English (the language which, in the case of Croatia, is not their mother tongue), then it is not easy to assess the relevance of the publication and to search the information resource quickly. These results support the findings of studies conducted outside the English-speaking countries by Avdic and Eklund (2010) in Sweden and Al-Moumen, Morris and Maynard (2012) in Kuwait. Swedish students admitted that English articles (in databases) were difficult for them to understand and the authors of the Kuwait study emphasized that students need to be proficient in English in order to make sense of database instruction, use appropriate search terms, understand the outcomes of searches and evaluate the materials found. On the one hand, this signals that the quantity of quality scholarly papers in languages other than English needs to be increased in the available scholarly databases. This, however is yet another issue which needs to be addressed at higher levels and concerns both the academic community and the publishing industry. On the other hand, it opens up a new research agenda for the authors: the role of cultural influences on students' searching. Table 5 shows all the barriers faced by students when searching electronic databases. No statistically significant differences were identified in relation to this question.

	%
Inaccessible from home	51.2
Habit of using Google first	46.9
Publications in foreign language	45.5
Difficult to assess the relevance and quality of publications	32.5
Time-consuming process	28.2
Relevant publications are found more easily and faster via Google	25.4

Lack of simple use instructions	19.1
Too many potentially relevant publications	18.2
Specific knowledge and skills are required	17.7
Infrequent use of databases	16.3
Level of complexity	13.9
It is not worth the effort	4.3
Do not contain relevant publications	3.3

Table 5: Barriers in electronic database searching

Since students reported a number of barriers related to searching electronic databases, they were asked to indicate whom they turn to for help when they come across a problem in database searching, or when searching yields no relevant results. The largest proportion of respondents turn to their fellow students (55%). Only about a quarter (25.8%) consults their university teachers. Since searching electronic databases and information literacy education are closely related with libraries and librarians, it does come somewhat as a surprise that only 20.6% of respondents reported seeking help from librarians. This result could suggest a number of scenarios such as: academic librarians/teachers are not perceived as potential helpers with database searching, librarians/teachers are not readily available for training, consultations or quick-fix support to students in their search process, or simply that students in general prefer to ask for help their colleagues and peers over teachers and librarians ([OCLC, 2002](#)). No statistically significant differences were identified in relation to this question.

In order to understand this issue slightly better, students were asked to mark their agreement with three statements referring to the availability of help when searching electronic databases, on a scale from 1 through 5 (1-fully disagree, 5-fully agree) (Table 6). The results are somewhat in line with the above-mentioned responses: while only 20.8% students agree with the statement that it is easy to obtain help with database searching from librarians, 37.6% agree that it is easy to obtain help from teachers. This suggests that academic librarians a priori should re-think their role and approach to information literacy training at their universities. Although they perceive themselves as a crucial element in providing support for information literacy, students apparently do not

see them as such. Interestingly, large proportions of respondents neither agreed nor disagreed with these statements. This might again suggest that they have not sought help with database searching so far and have not yet formed an opinion on this.

	Fully disagree	Disagree	Neither agree nor disagree	Agree	Fully agree	Mean
It is easy to get help from librarians when searching electronic databases.	15.9%	20.3%	43%	14%	6.8%	2.75
It is easy to get help from teachers when searching electronic databases.	8.3%	14.6%	39.5%	28.8%	8.8%	3.15
Online help with electronic databases is good.	6.8%	22.7%	50.7%	16.9%	2.9%	2.86

Table 6: Students' view of available help with database searching

Students' perception of electronic databases

In order to gain insight into the students' general perception of electronic databases, respondents were asked to mark their level of agreement with three statements, on a scale from 1 through 5 (1-fully disagree, 5-fully agree). As shown in Table 7, only 19.4% of respondents agree and over a half (50.9%) disagree with the statement that their teachers exaggerate when they talk about the importance of electronic databases. In relation to the statement "There is not much difference between publications I find through Google and in electronic databases." a large proportion of respondents are

negative (43.9%). Interestingly, as many as 42% are neutral. Since this is a negative statement, this result means that the largest proportion of respondents believes that there is a difference between the publications accessed via Google and the publications accessible via scholarly electronic databases. However, a large proportion of neutral answers to this question may also suggest that a significant proportion of respondents are not familiar enough with databases and therefore do not express any opinion on this. Finally, only 4.4% of respondents agree and 80% disagree with the statement on their personal understanding of the benefits of electronic database use. Since this was a negative statement, this result means that the majority of students reported that they understand the benefits of using this information resource.

These findings suggest that in general students are relatively positive about the electronic databases since the largest proportion believes that their teachers do not exaggerate when talking about electronic databases in superlatives, they understand the benefits of using them, and they believe that there is a difference between publications they find through Google and through electronic databases. On the other hand, it should be noted that a significant proportion of respondents are neutral regarding these statements (except for the last one), which means they have not formed an opinion about electronic databases yet, most probably because they do not have much experience with them. No statistically significant differences were identified in relation to these statements between students at undergraduate and graduate levels, and between academically less and academically more successful students.

	Fully disagree	Disagree	Neither agree nor disagree	Agree	Fully agree	Mean
My teachers exaggerate when they talk about the importance of electronic databases.	18.9%	32%	29.6%	14.1%	5.3%	2.55

There is not much difference between the publications I find through Google and in electronic databases.	13%	30.9%	42%	12.1%	1.9%	2.59
I do not understand the benefits of using electronic databases.	49.3%	30.7%	15.6%	2.9%	1.5%	1.77

Table 7: Students' perception of electronic databases

Concluding discussion

The study reported in this paper investigated the motivation, perception and use of scholarly electronic databases by LIS students in Croatia. The findings, based on the print survey of 209 LIS students, revealed that the majority of respondents believe that information literacy skills are important for their academic success and almost all had a formal training in electronic information searching, and in electronic databases searching. However, when asked to compare their scholarly databases and Google searching skills, respondents reported a higher level of proficiency with the latter.

In line with previous studies ([O'Farrell and Bates, 2009](#); [Lee, Paik and Joo, 2012](#)), the respondents reported far more frequent use of Google than of scholarly databases when searching for academic information. However, in contrast to previous studies ([e.g. Mbabu, Bertram and Varnum, 2013](#)) our findings showed that graduate students use electronic databases more frequently than undergraduate students.

This study is, to our knowledge, the first study to identify the role of students' intrinsic and extrinsic motivation in database use. When asked about the reasons behind their use of electronic databases, the majority of students reported intrinsic motivation: they use them because they personally believe they are a high quality resource. Again, there were

some marked differences between different groups of respondents: graduate students are more frequently intrinsically motivated to use electronic databases than undergraduate students. Since graduate students are also more frequent users of scholarly databases it could be concluded that intrinsic motivation is a stronger motivator. These findings suggest that, if students are to use electronic databases more frequently, they should not only familiarize themselves with their features, but truly understand the benefits of using this resource. Teachers' insistence on database use in academic assignments without explanation and proof of its concrete benefits (e.g. quality of paper, saving time) and without recognizing and rewarding their effort when grading the papers, will probably yield no long-term results.

In relation to the problems faced in electronic database searching, students reported several barriers. The three most relevant seem to be: inaccessibility of electronic databases from home, the habit of using Google for information searching and difficulties in understanding articles written in English. The barriers associated with accessibility and the English language should be considered within a larger cultural framework of developing countries, as suggested by Al-Moumen, Morris and Maynard ([2012](#)).

If students are to use this information resource more frequently, the perceived barriers should be removed. Having in mind the trend toward the internationalization of science and education, the majority of published scholarly papers will most probably continue to be written in English. Therefore, the solution to the language problem might be intensive English language classes offered to all students.

A change in the information behavior of students, and in particular in relation to their information resource preference and habits of their use, in the authors' view, can happen only if, as mentioned above, students truly understand the benefits of database use (intrinsic motivation) and if they have sufficient first-hand training in their use so that they become as familiar with them as with Google (the source they use most frequently). And here is where teachers can and should play a major role: information literacy should

be embedded in curricula and taught across different courses and topics throughout the study program. Teachers should "force" students into regular and continuous interaction with electronic databases to enhance familiarity with these sources, continuously guide them in that experience and provide feedback on their searches. As a result, students will develop a habit of using electronic databases and make them an important (if not the preferred) information resource in their information horizons ([Sonnenwald, 1999](#)).

Librarians, on the other hand, can also contribute significantly to the increased use of costly electronic databases by negotiating remote access (e.g. from students' homes) but also by more actively promoting their use among students, providing a more user-friendly environment for accessing library electronic sources and making themselves readily available for support in their use. Library-based information literacy training should be provided in different formats (one-on-one, group, online, face-to-face etc.) throughout the academic year so that different needs of students are accommodated. And last but not least, librarians should better integrate electronic databases into their holdings and use discovery services to make access to databases as convenient as possible. As it happens, the electronic databases at the studied universities cannot be searched via library catalogs but users must access each database individually (by clicking on an external link). If we recall that libraries subscribe to tens of databases, in practice this means that students must make a substantial effort and devote a significant amount of time to searching them. Surely this is a major barrier for students, who in general attend to their assignments last minute and do not wish to invest more effort than needed to obtain not the best, but good enough publications.

Despite the relatively small sample of respondents and the limitations inherent to the methodology used (survey), the findings reported here have implications for academic librarians and teachers charged with information literacy training and provision of costly, electronic resources. In order to better understand the obtained quantitative results and to understand how to help students use electronic databases more frequently and efficiently, the above announced follow-up qualitative study will soon be launched.

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