

The Role of Academic Libraries in Scholarly Communication. A Meta-Analysis of Research

Anna Mierzecka

University of Warsaw

anna.mierzecka@uw.edu.pl

ORCID: 0000-0003-2457-2399

ABSTRACT

The wide expansion of digital technologies has influenced research in all fields of science as well as educational activities. **Scientific objective:** The purpose of this article is to examine critical areas of academic library activity, in a significant or requiring far-reaching changes in all aspects, in the context of needs of the scientific community. **Research methods:** It was decided that the method that will allow to outline the situation in this area will be qualitative content analysis texts from leading journals. For this purpose, the main databases of Web of Science articles have been searched: Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI), using the instruction TS = (“academic library” OR “academic libraries” OR “university library” OR “university libraries”) AND TS = (scholars or scientists or faculty or researchers or academics). The query limited to the last five years yielded gave as results 170 articles, of which 51 were deemed relevant to the issues discussed. **Results and conclusions:** In the light of qualitative content analysis of those texts, it is possible to distinguish following areas as important: general approach of scholars and librarians to cooperation, practices of research support, access to information resources adapted to scholars’ needs, data curation support, publication strategies support. On this basis, conclusions have been drawn about the role and type of support that academic libraries may provide in the process of scholarly communication. **Cognitive value:** This study has contributed to the research into the evaluation of academic library’s support services in the process of scholarly communication.

KEYWORDS

academics, academic libraries, information needs, scholarly communication



Academic libraries are institutions whose mission consists of supporting the academic community, among others, scholars both in research and teaching activities. According to Cobblah and van der Walt (2016) “the library is the physical manifestation of the core values and activities of academic life and the library’s central role in the academic community is unquestionable.” However, is that really true? The popularization of digital technology caused the dynamic development of innovation connected to tools, techniques, and sources used for conducting research in all areas of science as well as for educational activity. A large part of the collections and services which supported the work of researchers moved to the Internet. This resulted in a situation where a growing number of library users stop showing up within its walls (Creaser & Spezi, 2013; Maceviciute, 2014) and, what follows, become unaware of the possibilities its services and collections offer. Will the unlimited access to information really cause libraries to become irrelevant? This question has been aptly answered by Jon Bing (2009), a Norwegian writer, in his statement: “To ask why we need libraries at all when there is so much information available elsewhere is about as sensible as asking if roadmaps are necessary now that there are so very many roads.” This proclamation seems to be especially accurate in relation to academic libraries and research work where it is particularly important to use information from valuable and reliable sources. It is also true, however, that academics rely more and more often on sources which are generally available on the Internet (Grigas, Juzeniene, & Velickaite, 2017; Matysek & Pulikowski, 2018). In this situation, when traditional services such as providing access to collections and literature searches may not be sufficient to maintain the key role of the library, there is a question of how else can it support the work of scientists?

According to the definition of the American Library Association the process of scholarly communication is understood as:

“The system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community and preserved for future use. The system includes both formal means of communication, such as publication in peer-reviewed journals, and informal channels, such as electronic listservs” (“Principles and Strategies for the Reform of Scholarly Communication 1,” 2006).

The aim of this article to examine critical areas of academic library activity, in a significant or requiring far-reaching changes in all aspect in the light of recent researches, in the context of needs of the scientific community, so that, in the next step, it will be possible to answer the question regarding the areas and ways in which academic libraries can support the participation of faculty in scholarly communication.

It has been ascertained that the best method which will allow the depiction of the situation within this area will be the qualitative analysis of the articles content from leading journals worldwide. To fulfill this aim leading article databases of the Web of Science were searched, including: Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI) as well as Arts & Humanities Citation Index (A&HCI), by inputting into the *topic* field the instruction TS = (“academic library” OR “academic libraries” OR “university library” OR “university libraries” OR “college library” OR “college libraries”) AND TS = (scholars OR scientists OR faculty OR researchers OR academics). The query, limited to time span 2013–2018 (to show the recent situation) resulted in 170 articles of which 51 were deemed to be relevant in relation to the issues being discussed. A lot of articles were irrelevant as the term “faculty” appears in different sense or in many cases despite the presence of those words the topic of articles was different. The instruction was purposefully formulated to cover such a large scope so

that all relevant publications could be found. The identification of articles concerning all forms of library support for academics was made on the basis of abstract review and later, the review of full article texts. The analysis of the content allowed the recognition of critical areas of academic library activity which are exceptionally important in supporting the pursuits of scholars.

Prior to the initiation of the analysis of identified articles the author wanted to clarify two important issues. The article will not expand on a very significant topic or the support of academics in their didactic work. Such a task would require the search instructions to be formulated differently because this matter mainly appears in the context of working with students. Additionally, these issues were discussed by the author in a previous work (Mierzecka, 2018). The other topic concerns the manner in which the term “academic library” is used within the present article. It signifies an institution, resources as well as the library space and, most of all, the group of people who through their work provide various types of library services supporting the academic community.

Later parts of the article are structured in accordance to the issues which have been identified through content analysis. First, texts concerning the general approach of scholars and librarians to cooperation, research revealing their attitudes as well as the needs and ideas for required support were discussed (10 publications). Following sections contain the description of studies dealing with activities which have already been implemented in libraries. These sub-sections reflect various areas of library operations aimed at supporting scientific work: participation of librarians in the entire research process (7 publications), providing library collections access in accordance to needs (17 publications), help in relation to data gathered through the research process (14 publications) and the selection of an appropriate publication strategy (5 publications). Texts sometimes fell under more than one category. The sub-section “Scholars’ support — different ideas” (9 publications) that contains interesting studies which, subject wise, did not fit into any other category, completes this part. The article culminates with conclusions dealing with the delineated situation of libraries and the share of their activities in the process of scholarly communication.

Research support: Librarians’ and scholars’ approach to collaboration

This section presents an analysis of recent literature on support which academic librarians may provide in the process of research. At the beginning let us examine the study which investigated general factors influencing effective collaboration between faculty members and librarians. The research team of Amante, Extremeño, and da Costa (2012) conducted a survey and focus interviews at the University Institute of Lisbon to explain this issue. From among variables which were analyzed the most determining turned out to be needs identification and understanding. The authors stated that: “Satisfying needs, perception and communication are also important, as they have an impact on trust. Perceptions are shaped by need identification and understanding and by communication. It is necessary to focus on these dimensions to cultivate positive perceptions of librarians and libraries among the faculty” (Amante et al., 2012, p. 100). This study proves the crucial role of research into users’ needs to ensure efficient collaboration of academic libraries with scholars.

There have been numerous studies to investigate the way collaboration related to research practices support should look. Falciani-White (2016) decided to investigate the entire research process in order to be able to answer the question of how librarians can support researchers. For this purpose she conducted interviews with scientists with significant amounts of disseminated scholarly works asking them to describe their recent projects starting with initial conceptualization all the way through their conclusion. She pointed out that librarians tend to support only the

information seeking stage while possibilities of participating in the research process are much wider. She distinguished five core categories of activities: information seeking, environment, social, dissemination and organization. For each of these categories she indicated ways in which librarians may try to support the researcher. One important conclusion of the research is that: “many members of the faculty have a traditional understanding of the work done by libraries (...) and need to be educated about other available services” (Falciani-White, 2016, pp. 124–125). Among non-traditional services Falciani-White lists: facilitating collaboration both on and off campus, helping faculty identify grants and other funding opportunities as well as identify journals to which manuscripts should be submitted. The research by Mattern et al. (2015) showed that researchers often lack knowledge about even the most basic library services (i.e., how to login remotely to the library’s resources) and their needs vary significantly depending on the research project in which they are involved in. The study among academics from University of Pretoria showed that researchers’ expectations for support from an academic library differ from the perceptions of information specialists. While they are undoubtedly interested in library collections (especially online information resources), the services like the librarians’ expertise need marketing actions — the researcher are often unaware of this kind of possible support (Nel & Fourie, 2016). It is obvious that the situation may be different in a developing country like Ghana, thus in the opinion of faculty and students traditional services like Internet services, provision of study space and literature searches were services that contributed most to academic achievements (Cobblah & van der Walt, 2016). Ko, Shim, and Pyo (2016) considered the willingness of Korean scholars and students to pay for library services with a not very surprising conclusion that neither respondents from private nor public universities were interested in such a solution.

A very interesting study was conducted by Cox, Kennan, Lyon, and Pinfield (2017) who explored a similar issue but from the perspective of academic librarians. They investigated the way academic librarians view research and, thus, how they understand their role in supporting it. Worthy of attention is the fact that librarians’ perception of research focused mainly on research-led teaching hence their belief that supporting teaching was equivalent to supporting research. Yet another general way of supporting research was presumed to occur through collection management. Interestingly, professional services such as reference work or copyright advisory was less often mentioned as a form of research support. This brings up a crucial question: what type and level of the engagement of librarians in research would support scholars best? A study carried out by Klain-Gabbay and Shoham (2016) clearly showed differences in the perceptions of academics and librarians. On the basis of a survey and interviews researchers established that the opinions of faculty members regarding the librarians’ contributions to scholarly communication are really diverse: some believed it to be desirable while others thought it to be outside the scope of the librarian’s responsibilities and considered collection preparation a sufficient way of supporting research. A fact that is even more puzzling is that the librarians’ perceptions on this topic also differ significantly: some admitted that they do not understand how they could contribute to scholarly communication, some found traditional activities to be sufficient and some would like to or participate already in activities meant to increase such involvement. An exhaustive study by Creaser and Spezi (2013) also offers the possibility to compare the perspective of academics and librarians. The authors distinguished four key areas where librarians may provide research support: literature searches, help with open access publishing, help with self-archiving in the institution’s open access repository and bibliometric services. The diversity of results obtained by means of a survey and case study interviews led them to the conclusion that, in general, librarians have problems with defining their role in research support. They lack an understanding of

research needs, do not feel confident enough to establish a connection offering help and perceive the scholars as ‘self-sufficient’ in their research. On the other hand, “faculty do not always welcome such moves either, failing to see how the librarian can contribute to their research, and may view such initiatives more as competition than support — someone encroaching on their own area of expertise” (Creaser & Spezi, 2013, p. 204). The authors indicated building personal relationships and establishing efficient communication with members of faculty as key factors to overcoming those difficulties. The observations made above might be augmented with a citation from an extensive study performed by (Maceviciute, 2014) who examined the developments of research libraries within recent years: “One of the most radical challenges to libraries in the last two decades is the realization that users no longer come to the libraries. Instead, libraries have to approach users where they are and in competition with other mediators that have emerged in scholarly communication” (p. 291). Thus, research support should not only be tailored to individual needs of academics but also has to be delivered directly to them.

Research support: Practices

The research mentioned above investigated the perception of the potential of librarians to contribute to research. Let us now move to studies describing actions already taken. Kaatrakoski and Lahikainen (2016) investigated the results of a Knotworking project at the Helsinki University Library which provided them with conclusions to consider the idea of embedded librarianship. As has been explained by the authors “Embedded librarianship is a built-in process in which librarians are increasingly more engaged in research activities and become partners with researchers and other members of the research communities” (Kaatrakoski & Lahikainen, 2016, p. 516). Moreover, it means meeting customers in their own communities and adjusting the services to their special needs. There was evidence that results of this project influenced library work in a positive way although authors concluded that there is a need for systematic procedures which strengthen this, otherwise accidental, kind of cooperation. Embedded librarianship also interested researchers from Canada (Bedi & Walde, 2017). Their study showed that librarians taking part in primary research may offer essential contribution to entire research process. Worthy of notice is the fact that their cooperation was the result of prior relationships with the faculty established during the performance of traditional duties (such as collection development, information literacy instructions). Reynolds, Smith, and D’Silva (2013) described a case study conducted at the University of Louisville where a field librarian, consulted in the beginning to offer advice regarding a literature search, contributed significantly to the whole research project, although, as she reported, she did not feel confident enough to push for changes in the research process. There are interesting initiatives to improve the skills of the library staff (de Jager, Nassimbeni, & Crowster, 2014; Hall, 2014; Hall & McBain, 2014). At Flinders University Library was launched three years project when the librarians were themselves supposed to conduct research. Even though it was difficult to reveal undeniable changes in librarians’ practices they defined themselves as more critically reflective thinkers and felt more comfortable with research support tasks. Another noteworthy study was conducted at Emory University and Ohio State University (Cain, Cheek, Kupsco, Hartel, & Getselman, 2016). The authors identified very concrete needs of academics, and they modified the services offered by the library to fit them. Since the researchers needed support in grant writing the librarians provided a new section on the library’s website with resources dedicated to this activity and employed an external scientific writing company to offer discounted editing services to staff. They provided cloud-based digital space for each researcher to store data, and they started to prepare data management plans. The abovementioned findings are only a few

examples of those which have been listed in the paper but this study is an excellent example of how librarians become engaged to understand their users' informational needs and how they immediately make an effort to meet them.

Access to information resources

Providing access to collections is traditionally the key area of supporting scientific work by libraries. Recently it has been possible to observe changes in the manner of gathering and providing access to resources caused by the popularization of digital technologies but there are still discussions regarding the value of digital publications both in the context of being useful for scientific work and in the didactic process. There are numerous publications which analyze the behavior of academics utilizing digital sources (i.e., Al-Shboul & Abrizah, 2014; Tahir, Mahmood, & Shafique, 2010; Toms & O'Brien, 2008; Zha, Zhang, & Yan, 2014), what then is the condition of research in relation to making the collections of academic libraries suitable to the needs of scientists? A very interesting study in this area has been carried out as part of *The Scholarly Reading and the Value of Library Resources* project (Volentine & Tenopir, 2013). Over 2,000 scholars from six British universities took part in a study aimed at determining the manner in which library collections can support scientific and didactic activity. On the basis of open questions posed in a questionnaire it has been discovered that one of significant aspects deciding about the usefulness of collections is the ability to quickly access the full text of the publication which, obviously, underscores the attractiveness of electronic publications. Interesting, however, is the fact that researchers indicated that they use library collections to access articles from periodicals but in relation to books or other publications they prefer to utilize non-library resources (this refers equally to printed as well as electronic books). It is worth mentioning that the interviewed scholars numerous times stressed the importance of libraries to scientific and didactic work.

Preferences of scholars representing particular scientific disciplines are still an important issue among studies concerning digital collections. This was the subject of a study conducted by (Dahl, 2013) who stated that for humanists the use of e-books is still a source of problems in working with source materials, imperfect options of reviewing content, more in-depth and long-lasting reading and the incidental discovery of useful content. She did unequivocally conclude, however, that despite the fact that printed sources will remain the preferred form of publication for humanists, electronic books are undoubtedly appropriate to fulfill their needs and that the librarians, aware of the problems mentioned above, should attempt to provide them with appropriate resources. Research carried out among historians making use of the academic library in Southwestern Ontario established that digital tools and collections are very useful to them and should be better integrated with collections physically present at the library since those give them the possibility of accidentally coming across useful information key to their work (Martin & Quan-Haase, 2016). In turn studies conducted among employees of the law department of Nirma University confirmed that academics preferred electronic resources to printed sources (Ashokbhai Bhatt, 2014). Studies realized among scholars in Spain revealed that representatives of sciences used literature databases most often but the authors were not able to find confirmation for the assumed correlation between the frequency in the use of these sources and the later effect of publications in browsed journals (Rodríguez-Bravo & Alvite-Diez, 2013). They are also studies carried out among academic library users different from countries (Ahmad & Brogan, 2016; Dadzie & van der Walt, 2015; Grigas et al., 2017; Nazari, Khosravi, & Babalhavaeji, 2013; Shimizu Wilson, D'Ambra, & Drummond, 2014) which showed the problems with academics' awareness of the existence of such digital tools as online databases and repositories. (Knight,

2013), on the basis of research carried out at the Northern Caribbean University observed a general principle — increasing of the number of digital sources at the library caused a rise in the utilization of all library's resources, digital as well as printed. He recommended greater cooperation between librarians and scientists in purchasing new works as well as initiation of training concerning resource use.

An interesting trend within these deliberations is the introduction of video games into digital collections (Farrell, Neeser, & Bishoff, 2017; Thomas & Clyde, 2013). These types of collections should, however, be very precisely adapted to the needs of particular groups of users.

Data curation support

The issue which, in light of analyzed literature, is yet another very important concern in the context of supporting scholars by academic librarians, are activities connected with data gathered through the research process. This fact is not remarkable since in 2012 the Association of College and Research Libraries identified data curation as a top trend for academic libraries. However, as has been highlighted by (Maceviciute, 2014) there are still many matters, such as economic, policy, and ethical issues connected with the reuse as well as the question of scholars' motivation to disclose information, which require resolving. (Weller & Monroe-Gulick, 2014) devoted their studies to the identification of the needs of researchers connected to data and ways in which academic libraries can become useful in this regard. On the basis of a survey carried out among academics from the University of Kansas, they stated that needs connected to data are, to a significant degree, dependent on the discipline of science as well as on the methodology of conducted research. Analysis of data, their storage and dissemination are the three areas in which scholars (over 50% of them) declared a need for support. In case of data analysis this need was mainly reported by researchers utilizing the quantitative methodology as well as representatives of social sciences, in respect to data storage it was the representatives of the sciences and relative to data dissemination it was academics representing social sciences. On the basis of their study results Weller and Monroe-Gulick suggested a number of changes which could make conducting research easier, such as the employment or training of librarians, experts specialized in individual methods of data analysis, who would support researchers from particular realms of science. Similarly, support in the area of archiving research data could be adapted to the requirements of a given discipline and the librarians responsible for creating repositories could offer help within this domain. (Kim, 2017) studied the attitudes of scholars from Korea toward sharing data and noticed that academic librarians should strive to establish good practices in respect to labeling data in relation to their author and the introduction of an embargo on shared data to ensure that their creators have priority in their full utilization. Focused group interviews among academics at Colorado State University (McLure, Level, Cranston, Oehlerts, & Culbertson, 2014) revealed that scholars would gladly see the librarians helping them in preparing a data management plan adjusted to their individual studies. Additionally, they were interested in a shared digital space for data storage although they were concerned about the loss of control over those collections. They also saw the librarians as intermediaries in their communication with other researchers participating in this process through the dissemination of information about their research as well as development and sharing of data. Importantly, scientists participating in research were not aware which activities within this realm were currently realized by the library. In turn, studies carried out at 11 Chinese universities (Liu & Ding, 2016) demonstrated that the majority of scholars do not possess appropriate skills to properly manage data and institutions in which they work do not offer them support in this area. A pilot project dealing with opening

a research data management platform and offering an array of services connected to it at the Wuhan University Library was met with academics' considerable interest. The main conclusion that can be drawn from this research is the lack of awareness among scholars but also among university administrators about the benefits of this type of activity, an issue which can become a substantial challenge but also an area within which librarians can act. Within this publication (Liu & Ding, 2016) as well as in the two which were previously mentioned (McLure et al., 2014; Weller & Monroe-Gulick, 2014) the need for special education of librarians, experts in the area of data management, has been highlighted. Similar conclusions were reached by Diekema, Wesolek, and Walters (2014) who also drew attention to the fact that neither the official granting agency requirements nor the general conviction of academics about the benefits of sharing data from research impact their actual activities in this realm. They distinguish the following areas where librarians should support the faculty in their data management efforts: providing tools for sharing research data, assisting with describing, finding, or accessing research data, providing information on copyright and ownership issues associated with data sets, and assisting with writing data management plans. The same observations are included in the studies of Lafia, Jablonski, Kuhn, Cooley and Medrano (2016), Cox et al. (2017), Swanson and Rinehart (2016), (Naum, 2014), Creaser and Spezi (2013). Wang (2013), describing the case of the Rutgers Library which is one of those pioneering libraries developing institutional data repository infrastructure and services, noticed similar problems to those already mentioned and highlighted the librarians efforts to adjust the support to individual users' needs. He states: "Reaching out to faculty and research departments, either to raise the awareness of data preservation needs or to actually help them curate their research data, is still very challenging, even though a well-designed institutional data repository is in place" (Wang, 2013, pp. 299–300). Services adjusted to the needs of individual scholars, personal contacts with academics, better understanding of research data management practices is the key to successful cooperation. Yet another fact that is worth noting is that even among librarians there is lack of common agreement about the necessity of these types of services. The study conducted among veterinary medicine librarians (MLA Veterinary Medical Libraries Section) shows that 36% of respondents believe that data services are somewhat less important than their other job activities while another 29% think that data services are just as important (Kerby, 2016, p. 306). Another study carried out among science librarians at institutions affiliated with the Association of Research Libraries confirms that data management work in research libraries is still in its emergent phase (Antell, Foote, Turner, & Shults, 2014). The vast majority of science librarians were aware of the new challenge of fulfilling researchers' data management needs even though they were uncertain about the skills that will be required but, at the same time, they were also optimistic about applying their "traditional" librarian skills to data management tasks.

Publication strategies support

Scholarly publishing practices are another area where changes in technology provided an impulse to reconsider the role of the library. The significance and possibilities afforded by Open Access emerge within this context. Hansson and Johannesson (2013) wondered "how academic librarians could manage a transgression from their traditional passive role as providers of literature into a more integrative role as proactive members of research groups with special responsibility for information provision and publication strategies" (p. 232). Interviews with librarians from three Swedish university libraries gave them foundations to claim that at that moment academic librarians tended to direct their publishing support activities to maintain and promote institutional repositories and, in general, and still lacked competences needed to actively

promote and help Open Access publishing. Despite that, Hansson and Johannesson pointed out that the growing significance of bibliometric indicators will, in the future, enhance the importance of academic librarians' support in publication process. The study performed by Gorraiz, Wieland, and Gumpenberger (2016) proves that there are institutions where librarians have already initiated such activity. At the University of Vienna, a team of librarians offers to create bibliometric assessment reports for individual researcher and on its basis suggest further publication strategy. Gorraiz, Wieland, and Gumpenberge, who belong to this team, state that: "Bibliometrics should be perceived as a compass for researchers in the 'publish or perish' dilemma in order to increase general visibility and to optimize publication strategies" (Gorraiz et al., 2016, p. 902). Feng and Zhao (2015) agree with this opinion and drew attention to the role of Open Access (OA) in the publishing strategy of researchers. They believe that OA provides librarians with opportunities for supporting academics by helping them to understand founders and publishers' policies related to Open Access and supporting the management of authors' rights. However, they also indicated that, at the moment, there is an inconsistency among academic libraries regarding the structure of such support. (Mangiafico & Smith, 2014) also saw OA as an element which could significantly change scholarly communication and highlighted the role of university libraries in the academic publishing environment. Since a key part of libraries' mission is to provide access to resources it would be considered their failure if they did not actively support researchers in this issue. The authors also noticed that those kinds of activities require the creation of new work places within the library and should be included in the library's budget. (Jones, 2013), who examined the topic of scholarly communication from the legal perspective, saw Open Access as a way to allow scholars to regain control of their works. The library should be an agent of those changes and not limit its actions to only Open Access support but also make efforts to change licenses and business models for e-collections.

Scholars' support: Different ideas

This sub-section contains interesting studies which, subject wise, did not fit into any other category completes this part, and they are not enough numerous to distinguish separated categories. Let us begin with studies which present a more general perspective of Open Access and library activities then publication strategy choice. Serrano-Vicente, Melero, and Abadal (2016) examined scholars' practices connected to Open Access at the University of Navarra, especially the use of institutional repositories. They found that there are differences in behaviors among scholars from different disciplines and when it came to medicine and life sciences documents were mostly turned over to be deposited by librarians, in social sciences they were archived by the scholars themselves and in humanities and physical sciences researchers used both of these methods equally often. However, regardless of their field all researchers were highly interested in services offered by repository managers. A study from Ethiopia showed that the implementation of OA in this country is still in its very early stages but most academics are aware of OA journals and would want academic librarians to promote those sources (Mammo & Ngulube, 2013).

The next issue concerns the previously mentioned topic of bibliometric support but seen in a context other than publishing. Suiter and Moulaison (2015) see the provision of information related to bibliometrics, citation analysis and altmetrics as part of the library's mission to support the informational needs of faculty members and claim that "academic libraries have an essential role to play in scholars' understanding of the metrics used to describe their work" (Suiter & Moulaison, 2015, p. 819). Their study showed that library websites of 62 universities making up the Association of American Universities (AAU) include extended information related to this issue allowing them to conclude that these libraries provided support in this area. However,

there might be a question whether support limited to putting that information on a website is sufficient. Demšar and Južnič (2013) went a step further and claimed that bibliometric skills of librarians should be regarded as an opportunity for libraries to develop and provide new value added information services. They argued that the essential support which librarians should provide researchers must include maintaining a centralized, unified and transparent system of researchers' bibliographies. What is more, librarians, especially in Central and Eastern European countries, should influence policy-makers to create valid research evaluation tools.

Academic library in scholarly communication: Conclusions





On the basis of an analysis of literature it can be clearly seen that at this moment we are dealing with profound changes and the redefinition of the role played by academic libraries in supporting researchers. The situation has been aptly summed up by Creaser and Spezi (2013) who indicate a need for changes: "With instant and remote access to resources and services, libraries have fallen off the faculty's radar" (p. 204). In consequence, instead of limiting themselves, as has been happening up to now, to two stages of research process – helping with information searching necessary for research and then purchasing appropriate journals and other sources with their results — academic libraries are trying to find a formula which will allow them to become active participants of the entire research process and, what follows, scholarly communication.

It must be highlighted that conclusions drawn on the basis of the analyzed literature are subject to limitations: not everything that happens in libraries finds reflection in articles. Additionally, the completed query does not cover all subject related literature but only that which can be found in the Web of Science databases which, presumably, should contain the most important scientific works (which is not always true). It can be assumed, however, that the accepted method allowed the investigation of main issues which, in the context of supporting researchers, are considered to be the most significant or the most difficult. What is more, except the study by (Maceviciute, 2014) which was based on the books, I did not find the recent literature reviews concerning issue of academic libraries in the lights of scholars' needs.

The content analysis allowed to distinguish the following main areas of library activity being examined in literature: active support / participation in the entire research process, providing access to collections fulfilling the needs of scholars (in relation to content and form), help in managing data gathered through the research process and help with selection of the right publishing strategy. Among them only providing access to resources has a long tradition in the practice of academic libraries. However, the problem of working out new forms of support for researchers in their scientific work can clearly be seen. Librarians, in most cases, feel unsure in their contacts with scholars, often lack skills and understanding of the specific character of the research process, activities initiated by them in libraries are frequently random (isolated), there is a lack of systemic solutions as well as ideas for types of services and ways of getting them to scholars. There are, however, cases where activities introduced by libraries satisfied both sides, the researchers and librarians. Table 1 contains a list of various types of research support which had been mentioned in analyzed texts. They have been assigned to individual phases of the scholarly communication process (in accordance with the ALA definition mentioned above) to investigate the possibilities of libraries in this perspective. As I did not find the previous studies on the role of academic library through perspective of scholarly communication, I think it will be useful to look on the activities indicated in the research from this point of view.

The main conclusion that can be drawn is that at the present time academic libraries have possibilities to participate and support scholarly communication at practically every stage. These are very diverse and sometimes may take the shape of singular activities and at others of complex,

Table 1. Academic library's support services in the process of scholarly communication

Scholarly communication stages	Academic library support services for scholars
<p>Creation</p> 	<ul style="list-style-type: none"> • Access to library resources • Embedded librarianship (entire research process participation) • Information seeking support <ul style="list-style-type: none"> – Research data seeking – Literature seeking • Facilitate collaboration both on-campus and off-campus • Grant support (identification and writings) • Data analysis support • Assisting with writing data management plans
<p>Evaluation for quality</p> 	<ul style="list-style-type: none"> • Bibliometrics indicators support • Identification of journals to submit manuscripts
<p>Dissemination to the scholarly community</p> 	<ul style="list-style-type: none"> • Copyright advisory • Open Access publishing advisory <ul style="list-style-type: none"> – Understanding funders' and publishers' policies related to Open Access – Supporting the management of authors' rights
<p>Preservation for future use</p> 	<ul style="list-style-type: none"> • Publication's archiving in the Open Access repository • Data curation <ul style="list-style-type: none"> – Providing tools for sharing research data – Providing information on copyright and ownership issues associated with data sets – Preparing research data to store (metadata, etc.)

Source: own study

multistage support. Regardless of the type of services provided there is a very strong need to tailor fit and adapt them to the needs of individual researchers. Traditionally libraries dedicated their services to particular groups of users: students, scientists, humanists, employees of specific departments, etc. Undoubtedly this approach, to a large degree, is still valid but when it comes to library resources but the services within the research process must accommodate individuals. According to the analyzed texts establishing individual communication with a scholar, often beyond the wall of the library, is the key element to effective cooperation. Subsequent steps should consist of adjusting activities to the needs of the academic and the specific research project on which he is working on. Considering the common problems of libraries with budget and number of employees this could initially mean a considerable limitation to the number of users which the librarians will be able to serve in this manner. We must remain hopeful, however, that if the quality of services improves considerably it will be noticed by the academic community and facilitate obtaining additional funding.

The spread of digital technologies caused, on the one hand, the weakening of relations between scholars and the library whose basic function was to, among others, ensure the access to resources. On the other hand, this has created possibilities for the library to take part in research

projects and scholarly communication as a partner who can offer specialized knowledge crucial in many of its stages. If libraries take advantage of this opportunity it may change not only the way they operate but also their position within the academic environment. Interestingly, studies concerning the functioning of academic libraries in relation to the needs of students did not show a necessity for very extensive changes although the obligation to fit services to the wants of individuals has also been indicated (Mierzecka, 2018). In this perspective research concerning the informational requirements of members of the academic community as well as sharing information regarding good practices of activities already initiated seems to be very significant. It is also worth placing more stress on the promotion of the listed above possibilities of academic libraries for supporting scholarly communication. In this context it would be recommended that librarian training programs pay more attention to the ability of communicating library services as activities making up scholarly communication.

References

- Ahmad, P., & Brogan, M. (2016). E-Book User Behaviour in Academic Libraries: The Role of User Agents in Perception and Satisfaction. *Malaysian Journal of Library & Information Science*, 21(3), 95–109.
- Al-Shboul, M. K., & Abrizah, A. (2014). Information Needs: Developing Personas of Humanities Scholars. *The Journal of Academic Librarianship*, 40(5), 500-509. doi:10.1016/j.acalib.2014.05.016
- Amante, M. J., Extremeño, A. I., & da Costa, A. F. (2012). Modelling Variables That Contribute to Faculty Willingness to Collaborate with Librarians: The Case of the University Institute of Lisbon (Iscte-Iul), Portugal. *Journal of Librarianship and Information Science*, 45(2), 91–102. doi:10.1177/0961000612457105
- Antell, K., Foote, J. B., Turner, J., & Shults, B. (2014). Dealing with Data: Science Librarians' Participation in Data Management at Association of Research Libraries Institutions. *College & Research Libraries*, 75(4), 557-574. doi:10.5860/crl.75.4.557
- Ashokbhai Bhatt, A. (2014). Information Needs, Perceptions and Quests of Law Faculty in the Digital Era. *The Electronic Library*, 32(5), 659-669. doi:10.1108/el-11-2012-0152
- Bedi, S., & Walde, C. (2017). Transforming Roles: Canadian Academic Librarians Embedded in Faculty Research Projects. *College & Research Libraries*, 78(3), 314-327. doi:10.5860/crl.78.3.314
- Cain, T. J., Cheek, F. M., Kupsco, J., Hartel, L. J., & Getselman, A. (2016). Health Sciences Libraries Forecasting Information Service Trends for Researchers: Models Applicable to All Academic Libraries. *College & Research Libraries*, 77(5), 595-613. doi:10.5860/crl.77.5.595
- Cobblah, M.-A., & van der Walt, T. (2016). The Contribution of Effective Library and Information Services to Academic Achievements at Some Selected Universities in Ghana. *Libri*, 66(4), 275–289. doi:10.1515/libri-2016-0035
- Cox, A. M., Kennan, M. A., Lyon, L., & Pinfield, S. (2017). Developments in Research Data Management in Academic Libraries: Towards an Understanding of Research Data Service Maturity. *Journal of the Association for Information Science and Technology*, 68(9), 2182-2200. doi:10.1002/asi.23781
- Creaser, C., & Spezi, V. (2013). Improving Perceptions of Value to Teaching and Research Staff: The Next Challenge for Academic Libraries. *Journal of Librarianship and Information Science*, 46(3), 191–206. doi:10.1177/0961000613477678
- Dadzie, P., & van der Walt, T. (2015). Access and Use of Digital Resources: A Survey of Their Value for Faculty in Three Ghanaian Universities. *Libri*, 65(1), 57-70. doi:10.1515/libri-2014-1026
- Dahl, C. (2013). Pda and the Humanities. *The Electronic Library*, 31(6), 745–752. doi:10.1108/el-05-2012-0051
- de Jager, K., Nassimbeni, M., & Crowster, N. (2014). Developing a New Librarian. *Information Development*, 32(3), 285-292. doi:10.1177/0266666914542032
- Demšar, F., & Južnič, P. (2013). Transparency of Research Policy and the Role of Librarians. *Journal of Librarianship and Information Science*, 46(2), 139–147. doi:10.1177/0961000613503002
- Diekema, A. R., Wesolek, A., & Walters, C. D. (2014). The Nsf/Nih Effect: Surveying the Effect of Data Management Requirements on Faculty, Sponsored Programs, and Institutional Repositories. *The Journal of Academic Librarianship*, 40(3–4), 322–331. doi:10.1016/j.acalib.2014.04.010

- Falciani-White, N. (2016). Understanding the “Complexity of Experience”: Modeling Faculty Research Practices. *The Journal of Academic Librarianship*, 42(2), 118–126. doi:10.1016/j.acalib.2016.01.003
- Farrell, S., Neeser, A., & Bishoff, C. (2017). Academic Uses of Video Games: A Qualitative Assessment of Research and Teaching Needs at a Large Research University. *College & Research Libraries*, 78(5), 675–705. doi:10.5860/crl.78.5.675
- Feng, J., & Zhao, N. (2015). A New Role of Chinese Academic Librarians—the Development of Embedded Patent Information Services at Nanjing Technology University Library, China. *The Journal of Academic Librarianship*, 41(3), 292–300. doi:10.1016/j.acalib.2015.03.010
- Gorraiz, J., Wieland, M., & Gumpenberger, C. (2016). Individual Bibliometric Assessment at University of Vienna: From Numbers to Multidimensional Profiles. *El Profesional de la Información*, 25(6), 901–914. doi:10.3145/epi.2016.nov.07
- Grigas, V., Juzeniene, S., & Velickaite, J. (2017). ‘Just Google It’ – the Scope of Freely Available Information Sources for Doctoral Thesis Writing. *Information Research-an International Electronic Journal*, 22(1), 18.
- Hall, L. W. (2014). Changing the Workplace Culture at Flinders University Library: From Pragmatism to Professional Reflection. *Australian Academic & Research Libraries*, 46(1), 29–38. doi:10.1080/00048623.2014.985773
- Hall, L. W., & McBain, I. (2014). Practitioner Research in an Academic Library: Evaluating the Impact of a Support Group. *The Australian Library Journal*, 63(2), 129–143. doi:10.1080/00049670.2014.898238
- Hansson, J., & Johannesson, K. (2013). Librarians’ Views of Academic Library Support for Scholarly Publishing: An Every-Day Perspective. *The Journal of Academic Librarianship*, 39(3), 232–240. doi:10.1016/j.acalib.2013.02.002
- Jones, D. R. (2013). Locked Collections: Copyright and the Future of Research Support. *Law Library Journal*, 105(4), 425–460.
- Kaatrakoski, H., & Lahikainen, J. (2016). “What We Do Every Day Is Impossible”: Managing Change by Developing a Knotworking Culture in an Academic Library. *The Journal of Academic Librarianship*, 42(5), 515–521. doi:10.1016/j.acalib.2016.06.001
- Kerby, E. E. (2016). Research Data Services in Veterinary Medicine Libraries. *Journal of the Medical Library Association*, 104(4), 305–308. doi:10.3163/1536-5050.104.4.010
- Kim, J. (2017). Data Sharing from the Perspective of Faculty in Korea. *Libri*, 67(3), 179–192. doi:10.1515/libri-2016-0116
- Klain-Gabbay, L., & Shoham, S. (2016). Scholarly Communication and Academic Librarians. *Library & Information Science Research*, 38(2), 170–179. doi:10.1016/j.lisr.2016.04.004
- Knight, N. (2013). Enhancing Access to Library Resources at Northern Caribbean University through an E-Library Initiative. *The Electronic Library*, 31(6), 753–769. doi:10.1108/el-01-2012-0001
- Ko, Y. M., Shim, W., & Pyo, S.-H. (2016). Factors Affecting Users’ Assessment of the Economic Value of University Library Services. *Journal of Librarianship and Information Science*, 48(3), 223–235. doi:10.1177/0961000614566338
- Lafia, S., Jablonski, J., Kuhn, W., Cooley, S., & Medrano, F. A. (2016). Spatial Discovery and the Research Library. *Transactions in GIS*, 20(3), 399–412. doi:10.1111/tgis.12235
- Liu, X., & Ding, N. (2016). Research Data Management in Universities of Central China. *The Electronic Library*, 34(5), 808–822. doi:10.1108/el-04-2015-0063
- Maceviciute, E. (2014). Research Libraries in a Modern Environment. *Journal of Documentation*, 70(2), 282–302. doi:10.1108/jd-04-2013-0044
- Mammo, Y., & Ngulube, P. (2013). Academics’ Use and Attitude Towards Open Access in Selected Higher Learning Institutions of Ethiopia. *Information Development*, 31(1), 13–26. doi:10.1177/0266666913500977
- Mangiafico, P., & Smith, K. L. (2014). Reason, Risk, and Reward: Models for Libraries and Other Stakeholders in an Evolving Scholarly Publishing Ecosystem. *Cultural Anthropology*, 29(2), 216–235.
- Martin, K., & Quan-Haase, A. (2016). The Role of Agency in Historians’ Experiences of Serendipity in Physical and Digital Information Environments. *Journal of Documentation*, 72(6), 1008–1026. doi:10.1108/jd-11-2015-0144
- Mattern, E., Andrew Cox, D., Jeng, W., He, D., Lyon, L., & Brenner, A. (2015). Using Participatory Design and Visual Narrative Inquiry to Investigate Researchers’ Data Challenges and Recommendations for Library Research Data Services. *Program*, 49(4), 408–423. doi:10.1108/prog-01-2015-0012

- Matysek, A., & Pulikowski, A. (2018). Strategie wyboru źródeł informacji naukowej. *Katowice, 29–30 listopada 2018: Prezentacja z konferencji „Zarządzanie informacją w nauce”*. <http://hdl.handle.net/20.500.12128/7765>
- McLure, M., Level, A. V., Cranston, C. L., Oehlerts, B., & Culbertson, M. (2014). Data Curation: A Study of Researcher Practices and Needs. *Portal-Libraries and the Academy, 14*(2), 139–164.
- Mierzecka, A. (2018). Students' Information Needs and Digital Technologies in Academic Libraries. *Przegląd Biblioteczny, 86*(4), 509–530.
- Naum, A. (2014). Research Data Storage and Management: Library Staff Participation in Showcasing Research Data at the University of Adelaide. *The Australian Library Journal, 63*(1), 35–44. doi:10.1080/00049670.2014.890019
- Nazari, F., Khosravi, F., & Babalhavaeji, F. (2013). Applying Rogers' Diffusion of Innovation Theory to the Acceptance of Online Databases at University Zone of Iran. *Malaysian Journal of Library & Information Science, 18*(3), 25–38.
- Nel, M. A., & Fourie, I. (2016). Information Behavior and Expectations of Veterinary Researchers and Their Requirements for Academic Library Services. *The Journal of Academic Librarianship, 42*(1), 44–54. doi:10.1016/j.acalib.2015.10.007
- Principles and Strategies for the Reform of Scholarly Communication 1, (2006).
- Reynolds, L. M., Smith, S. E., & D'Silva, M. U. (2013). The Search for Elusive Social Media Data: An Evolving Librarian–Faculty Collaboration. *The Journal of Academic Librarianship, 39*(5), 378–384. doi:10.1016/j.acalib.2013.02.007
- Rodríguez-Bravo, B., & Alvite-Díez, M. L. (2013). Impact of the Consumption of Electronic Contents on Research Productivity in the Universities of Castile and Leon. *Library Collections, Acquisitions, and Technical Services, 37*(3–4), 85–106. doi:10.1016/j.lcats.2013.09.007
- Serrano-Vicente, R., Melero, R., & Abadal, E. (2016). Open Access Awareness and Perceptions in an Institutional Landscape. *The Journal of Academic Librarianship, 42*(5), 595–603. doi:10.1016/j.acalib.2016.07.002
- Shimizu Wilson, C., D'Ambra, J., & Drummond, R. (2014). Exploring the Fit of E-Books to the Needs of Medical Academics in Australia. *The Electronic Library, 32*(3), 403–422. doi:10.1108/el-09-2012-0118
- Suiter, A. M., & Moulaison, H. L. (2015). Supporting Scholars: An Analysis of Academic Library Websites' Documentation on Metrics and Impact. *The Journal of Academic Librarianship, 41*(6), 814–820. doi:10.1016/j.acalib.2015.09.004
- Swanson, J., & Rinehart, A. K. (2016). Data in Context: Using Case Studies to Generate a Common Understanding of Data in Academic Libraries. *The Journal of Academic Librarianship, 42*(1), 97–101. doi:10.1016/j.acalib.2015.11.005
- Tahir, M., Mahmood, K., & Shafique, F. (2010). Use of Electronic Information Resources and Facilities by Humanities Scholars. *The Electronic Library, 28*(1), 122–136.
- Thomas, C. M., & Clyde, J. (2013). Game as Book: Selecting Video Games for Academic Libraries Based on Discipline Specific Knowledge. *The Journal of Academic Librarianship, 39*(6), 522–527. doi:10.1016/j.acalib.2013.07.002
- Toms, E., & O'Brien, H. L. (2008). Understanding the Information and Communication Technology Needs of the E-Humanist. *Journal of Documentation, 64*(1), 102–130.
- Volentine, R., & Tenopir, C. (2013). Value of Academic Reading and Value of the Library in Academics' Own Words. *Aslib Proceedings, 65*(4), 425–440. doi:10.1108/ap-03-2012-0025
- Wang, M. (2013). Supporting the Research Process through Expanded Library Data Services. *Program, 47*(3), 282–303. doi:10.1108/prog-04-2012-0010
- Weller, T., & Monroe-Gulick, A. (2014). Understanding Methodological and Disciplinary Differences in the Data Practices of Academic Researchers. *Library Hi Tech, 32*(3), 467–482. doi:10.1108/lht-02-2014-0021
- Zha, X., Zhang, J., & Yan, Y. (2014). Exploring the Effect of Individual Differences on User Perceptions of Print and Electronic Resources. *Library Hi Tech, 32*(2), 346–367. doi:10.1108/LHT-07-2013-0099