Defining scholarly practices, methods and tools in the Lithuanian digital humanities research community

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Abstract

The article discusses the current situation in the adoption of digital tools and practices in the humanities and arts in Lithuania, based on a major European survey conducted by the Digital Research Infrastructure for the Arts and Humanities (DARIAH) in 2014 and 2015. The survey was aimed at understanding existing scholarly practices, methods and tools that are applied by researchers, as well as attitudes towards digital technologies in research and scholarship. This article analyzes specific aspects of scholarly research activities and digital needs in Lithuania, and provides evidence-based insights on the national digital humanities landscape.

1. Understanding scholarly practices in the digital humanities

[1](#)
Digital Humanities can be broadly characterized as the adoption of an array of computational methodologies for humanities research [[Schreibman, Siemens, and Unsworth 2004](#)]. As a field of study it became more akin to a common methodological outlook, rather than just dependent on digital data or even digital technologies [[Kirschenbaum 2012](#)]. The definition of digital humanities presented in the Digital Humanities Manifesto, originally published in 2008, puts emphasis on research activity by describing digital humanities as a variety of scholarly practices evolving along digital data, media tools and techniques:

Digital Humanities is not a unified field but an array of convergent practices that explore a universe in which: a) print is no longer the exclusive or the normative medium in which knowledge is produced and/or disseminated; instead, print finds itself absorbed into new, multimedia configurations; and b) digital tools, techniques, and media have altered the production and dissemination of knowledge in the arts, human and social sciences. [[Digital Humanities Manifesto 2.0 2009](#)]

[2](#)

While scholarly practices are in the very essence of the concept, defying and understanding them remains an important task for researchers, especially in the field of information behavior, its management, curation and communication, and use of digital technologies within information science. The nature of digital humanities as an interdisciplinary field, where research practice continues on developing differently within separate research areas, or (even more so) it tends to hinge on a single project or individual research, entails inevitable complexity. Nowadays, the enhancement of the scholarly research process is being challenged by the need to build an infrastructure for digital scholarship similar to that already established in the sciences, commonly identified as *Cyberinfrastructure* or *eScience* [Crane, Babeu, and Bamman 2007]. Its development and capacity to support the field and ensure better research quality strongly relies on identification of actual scholarly needs. Even if it is hard to predict the full form of such an infrastructure in the future, the identification of services already in use may significantly contribute to its establishment, shifting from isolated, project based applications to ubiquitous and often invisible elements of a shared infrastructure [Crane, Babeu, and Bamman 2007].

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The exclusion of processes in scholarly work, such as changing, browsing and extracting, is an important part of the information behavior research [Ellis 1993]. The revised model of information seeking behavior, which derived from the data collected from interviews of social science researchers, included six generic features, such as starting, chaining, browsing, differentiating, monitoring and extracting [Meho and Tibbo 2003]. Endeavours in seeking to perceive the basic functions of the digital humanities lead to the notion of "scholarly primitives", the term describing scholarly activities, which are independent from theoretical orientation and cross the boundaries of different research disciplines [Unsworth 2000]. Similar principles apply to the idea of "methodological commons", as the set of the most common activities that inter-connect different content, tools and methods [Mccarty and Short 2002]. The later notions were developed into recombination of scholarly activities under five main categories, such as searching, collecting, reading, writing and collaborating [Palmer et al. 2009].

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A digital humanities taxonomy, on the other hand, is a pragmatic expression of classifying such activities and representing them in a categorized manner. In 2005, the Arts and Humanities Data Service (AHDS) ICT methods network started to develop a taxonomy of computational methods, showcasing digital humanities in practice in order to understand the impact of digital content, tools and methods on humanities and arts scholarship [AHDS Projects and Method Database 2004]. The taxonomy serves as a controlled vocabulary and classifies method terms according to two dimensions: firstly, "content types", based on the nature of the content of the digital resource employed, and, secondly, "function types", based on the broad functions commonly undertaken in digital resource creation processes [Speck 2005]. The taxonomy was later adopted by the Digital Humanities Observatory (DHO) and by the Oxford University Digital Humanities Programme, and used for the description of digital humanities projects, thus providing a framework for understanding how digital methods enable research practice and how they work with existing content and tools [Hughes, Constantopoulos, and Dallas 2015].

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Another initiative on developing a Digital Humanities Taxonomy was launched by Project Bamboo and its Digital Research Tools (DiRT) Directory, which focused on allowing researchers to find and compare digital research resources and software tools [DiRT 2016]. In collaboration with DARIAH-DE, the national project affiliated with DARIAH-EU in Germany, it developed the Taxonomy of Digital Research Activities in the Humanities (TaDiRAH). The taxonomy splits into three main categories: a) research activities, b) research objects, and c) research techniques, and includes more

detailed sub-categories with descriptions [TaDiRAH 2016]. The creation of TaDiRAH was based on a pragmatic, bottom-up and user centric approach, where the emerging taxonomy framework was developed by summarizing existing collections of content and allowing tool users such as scholars, developers and practitioners to review and add content [Luise et al. 2016].

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A more profound view on scholarly work inevitably leads to the development of a conceptual domain model, or ontology, that seeks to be more theoretically rigorous than a taxonomy. Such an ontology could help to establish a common understanding and vocabulary within the digital humanities community, to link content, tools and methods and tackle their heterogeneity, as well as to approach theoretical issues questioning critically the underlying processes of contemporary scholarship [Hughes, Constantopoulos, and Dallas 2015]. The creation of a digital humanities ontology is an ongoing effort, undertaken by the Digital Curation Unit, Athena Research Centre in collaboration with the Network for Digital Methods in the Arts and Humanities (NeDiMAH) and DARIAH-EU [NeDiMAH 2015] [DARIAH-EU 2018]; the first edition of the upper and middle layers of the ontology has been published in 2015 (http://nemo.dcu.gr). The development of the NeDiMAH Methods Ontology (NeMO) is based on the Scholarly Research Activity Model (SRAM), which conceptualizes the research process through a network of inter-related entities, such as actors, activities, methods, procedures, resources, formats, tools and services, and goals. It seeks to capture three complementary aspects of research, i.e., from the point of view of actors (agency), processes and resources, using the central notion of activity to provide a common ground for all of them [Benardou, Constantopoulos, and Dallas 2013]. The NeMO ontology seeks to encompass not just digital humanities work in the stricter sense but also digitally-enabled work in general by including a broad spectrum of humanities disciplines and covering in equal measure methods focused on use and modification of digital resources, as well as research methods representing all phases of the scholarly research life cycle [Hughes, Constantopoulos, and Dallas 2015].

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Research work on scholarly information behavior and needs, on taxonomies of digital methods and tools and on conceptual modeling of the scholarly process are the background for the investigation of the scholarly practices, digital needs and attitudes of European researchers in the human sciences [Dallas and Chatzidiakou 2018]. It attempts to take stock of the digital work, researchers' needs and attitudes to provide much needed baseline to understand these practices for educational purposes of early researchers in the field and for better requirement analysis of digital infrastructures, tools and services, as well as for much needed epistemological reflexivity within the current state of the human sciences [Dallas and Chatzidiakou 2018]. In this context, the DARIAH European survey on scholarly practices and digital needs in the arts and humanities was planned as a transnational study aiming to capture the use of digital methods and tools among all human science disciplines across Europe. The Digital Research Infrastructure for the Arts and Humanities (DARIAH) is a pan-European network of institutions, which aims "to enhance and support digitally-enabled research across the arts and humanities" [DARIAH-EU 2018]. The work of Task 2 "Understanding and expanding scholarly practice" within DARIAH had focused on scholarly information activities, research needs, scholarly use and impact of digital technology and later carried out its work as Digital Methods and Practices Observatory (DiMPO), employing an international research team of more than twenty researchers from fourteen European countries seeking to develop and provide an evidence-based, up-to-date, and pragmatically useful account of the emerging information practices, needs and attitudes of the arts and humanities researchers in the evolving European digital scholarly environment [DARIAH Working Groups 2016]. The scope of DiMPO is to operate "through the inception of a longitudinal mixed methods employed inn digitally-enabled arts and humanities work across Europe, ad through the digital

dissemination, validation and enrichment of research outcomes by the scholarly community" [Dallas and Chatzidiakou 2018]. The survey was developed and conducted by DiMPO researchers as a part of an integrated work plan serving the main purpose of monitoring and understanding state of the art scholarly research across Europe and identifying the actual needs of the researchers in the various fields of arts and humanities.

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The survey was launched in June 2014 and was open to respondents until March 2015 [DARIAH Survey 2015]. It was disseminated online in English and in nine additional national languages[1]. Overall it gathered 2177 valid responses by scholars in human sciences from sixteen European countries. In order to ensure consistent and representative results of the investigation, ten countries yielding more than one hundred responses were selected for more detailed descriptive analysis and reporting, while six of them were excluded from the study due to the lack of responses (see Figure 1).

Number of responses

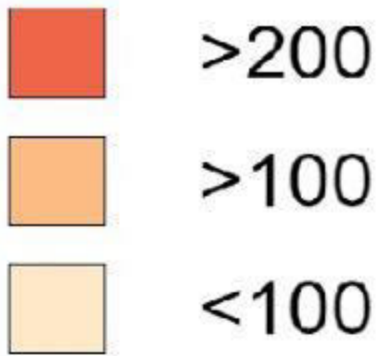- >200
- >100
- <100

Ireland

Figure 1.
The number of survey respondents across European countries.

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The main motivation of the survey project was "to establish a baseline across different European countries and scholarly disciplines with regard to questions regarding the use of digital technologies to access, organize, analyze and disseminate scholarly information resources ranging from primary data to organized databases and scholarly publications" [Dallas and Chatzidiakou 2018]. The scope of the survey allowed to map and analyze specific aspects and statistical trends of the scholarly research activities in the arts and digital humanities at national and international levels. Given the pragmatic limitations, the priority was given to reveal the aspects and research needs of scholarly practices relevant to the capabilities of data and content driven digital infrastructures, such as DARIAH-EU; thus the survey "sought to collect reliable evidence on essential aspects of scholarly information behavior and attitudes rather than develop a full picture, something that would require a much longer questionnaire as well as complementary research instruments" [Dallas and Chatzidiakou 2018]. Hence, equally important aspects related to other considerations, e. g. epistemological or ethical-political entailments of particular kinds of research, or funding, organizational and career implications for researchers, were out of the scope of this survey [Dallas and Chatzidiakou 2018]. There are further plans within the DiMPO work group to develop more sophisticated, inferential and multivariate analysis of the quantitative data produced by this survey and longitudinal investigation, "while considering carefully how many years should intervene before consecutive iterations of the survey, as well as to initiate a multi-case studies research "aiming to provide response on 'how' and 'why' dimensions of scholarly practice and needs in the digital environment" [Dallas and Chatzidiakou 2018].

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The research design of the survey relied on the prior work of the research team focusing on proposed "scholarly research activity model" helping to better understand the research process and its components [Benardou, Constantopoulos, and Dallas 2013], as well as already developed notions of generic functions and scholarly primitives [Palmer et al. 2009] [Unsworth 2000], thus defining the scope of the survey:

Scholarly work involving digital resources, methods and infrastructures was considered an integral activity encompassing all stages of the research process, from the definition of research questions and the orientation within a literature or domain to the capture and constitution of salient evidence (data, resources), to information seeking, management, curation, dissemination and use. Infrastructure, under consideration included software applications installed at the researchers' computer, but also online services, systems and tools, including pervasive, globally accessible commercial digital infrastructures. Practices examined included both those based on digital technologies and their non-digital counterparts, to ensure meaningful comparisons between, e.g. using a digital device to consult a particular kind of scholarly resource versus the use of an analogue format for the same purpose. [Dallas and Chatzidiakou 2018]

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Based on this approach and considering the main information activities undertaken in the course of the scholarly work, the final set of survey questions was selected to cover the five following areas: *Use of digital methods and tools*, *Seeking research assets*, *Organizing research assets*, *Annotating and curating research assets* and *Collaborating and disseminating research work* [Dallas and Chatzidiakou 2018]. The questionnaire consisted of twenty questions. Twelve of them concerned scholarly

information practices and needs of respondents, as well as digital methods and tools in the course of scholarly work constituted by information seeking, research data organization, annotation, curation, collaboration and dissemination patterns (e.g. use of devices to consult research material, identification of digital methods and tools that one uses, commonly accessed applications, ways of research dissemination, etc.). While eight of them invited researchers to provide some biographical information, which contributed to the definition and composition of community members (e.g. one's primary discipline, institutional affiliation, year in research, gender, age, etc.).

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The survey adopted a broader approach to its population of interest targeting "researchers in the human sciences residing in Europe who use, plan to use, or have an interest to know about the application of digital resources, methods and tools" [Dallas and Chatzidiakou 2018]. Therefore the final sample of respondents consisted not only of researchers who clearly identified themselves as digital humanists, but also included those who were keen or interested in using digital services and tools.

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The analysis and interpretation of the survey results was undertaken by DiMPO researchers who provided country-based reports of statistically-significant results. This article is the presentation of the Lithuanian results on scholarly work and the employment of digital methods and tools by the national digital humanities community, conducted as part of this broader research. It seeks to present the national position towards digital humanities and to provide insights on the existing research community that is engaged or interested in using various digital tools in scholarly work, based on the evident statistical results, which has never been collected to systematically approach the issue related to national information practice, even though the digitization of cultural heritage and the creation of digital research data along with digitally-enabled scholarly work has been going on in Lithuania for more than 20 years. The first study designed to analyze the effect of digital technologies was done in 2003 in the area of archaeology and underlined an existing necessity indicated by the majority of archaeologists to use digital data in research, which was mainly driven by personal research interests [Laužikas 2006]. Significant drawbacks at the moment were associated with obsolete software, lack of digitized research data and low level of standardization in the area of digital archaeology [Laužikas 2006]. Another study more broadly related to the development of national digital humanities infrastructure was carried out by the Faculty of Communication of Vilnius University [Laužikas 2012]. It attempted to provide an overview and analysis situation regarding the digitization of cultural heritage and research data in relation to existing national information infrastructures. The analysis showed the creation and development of the Lithuanian digital research infrastructure would be greatly influenced by institutional, technological and function distribution factors, and less so by legal and administrative factors, while the influence of economic and social factors would be the least important [Laužikas 2012]. However, the research did not include any analysis of scholarly activity and did not seek to capture the needs of researchers working in the area of digital humanities. Another similar study done in 2014 focused on the strategic management of heritage digitization in Lithuania and sought to develop a conceptual approach towards digital cultural heritage presenting it in a changing social context of "network society" [Laužikas and Varnienė 2014]. The issue of the study was on heritage digitization, which was carried out without fully evaluating the social context and consolidating resources, thus resulting in poor quality digitization products, which were unrelated and satisfied the needs of institutions rather than of the users [Laužikas and Varnienė 2014]. Additionally, periodic statistical studies of the Lithuanian scientific and scholarly institutions and research communities are carried out providing important evidence-based data on the current national research situation and statistical trends. Two of them, conducted within the time span of the survey, are considered relevant for this publication to provide insights on the quantitative aspects of human sciences in Lithuania

[Bumelis et al. 2014] [Pauliukaitė-Gečienė et al. 2016]. However, it is important to note that none of these studies had properly assessed the prevalence of digital technologies across all humanities disciplines and the impact of digital research at national, nevertheless international, scales. The DARIAH European survey on scholarly practices and digital needs in the arts and humanities disseminated at the national level was the first attempt to fill the gap in information practices and information behaviour research by comprehensively identifying and analyzing scholarly activities in the digital environment carried out by Lithuanian scholars. Furthermore, it was the first assay to compare the national phenomena with the European dimensions, thus providing an international context to the Lithuanian case study and seeing it as an integral part of the European digital humanities community.

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A purposive sampling process was adopted during the recruitment of the Lithuanian respondents. The invitations to participate in the survey were sent to eight accredited universities[2], five institutes and research centers[3] that conduct research in the arts and humanities or are engaged in digitization activities and digital cultural heritage projects. Professional associations or societies, such as librarians, museum professionals, archivists, archaeologists, historians, etc., were also addressed. Thus the survey was designed to focus on defining a broader community of digitally-enabled researchers. The survey was disseminated as DARIAH digital humanities survey and explicitly invited scholars working in the field of digital humanities and arts, as well as scholars working in the area of digitization and also with digital technologies to respond. Therefore, the assumption was made that all 137 respondents should be considered to be a part of the national community of digital humanities, though the proficiency to adopt digital technologies may vary among community members. Based on the survey results, this assumption later on led to the distinction of "digitally-enabled humanists" and "digitally-aware humanists", both considered to be relevant to a current state and development of the national digital humanities research community. The study draws attention to scholars and actual scholarly work that happens not only in digitization projects or within digital infrastructure, but also very much depends on one's personal attitudes and needs, thus contributing to a better understanding of the national state of art digital research environment.

2. Defining the community of Lithuanian digital humanists

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The overall community of Lithuanian humanists working in higher education consists of 1108 members [Pauliukaitė-Gečienė et al. 2016]. The survey sample consisted of 137 complete responses coming from the Lithuanian digital humanists thus representing 12,4% of the total scholarly population. Two key indicators, gender and age, were used to define basic demographic aspects of respondents. The former indicated that the majority of researchers working in the arts and humanities field are female (60,6%), while male researchers constitute 39,4% of the community (see Figure 2). The ratio of male to female digital humanities scholars is consistent with the general characteristics of the Lithuanian scientific community. As indicated in the "Report of the Lithuanian science state" [Bumelis et al. 2014] the ratio of female researchers has been consistently increasing over the last decade and it is one of the highest in the European Union countries exceeding an estimated EU average by 20%.
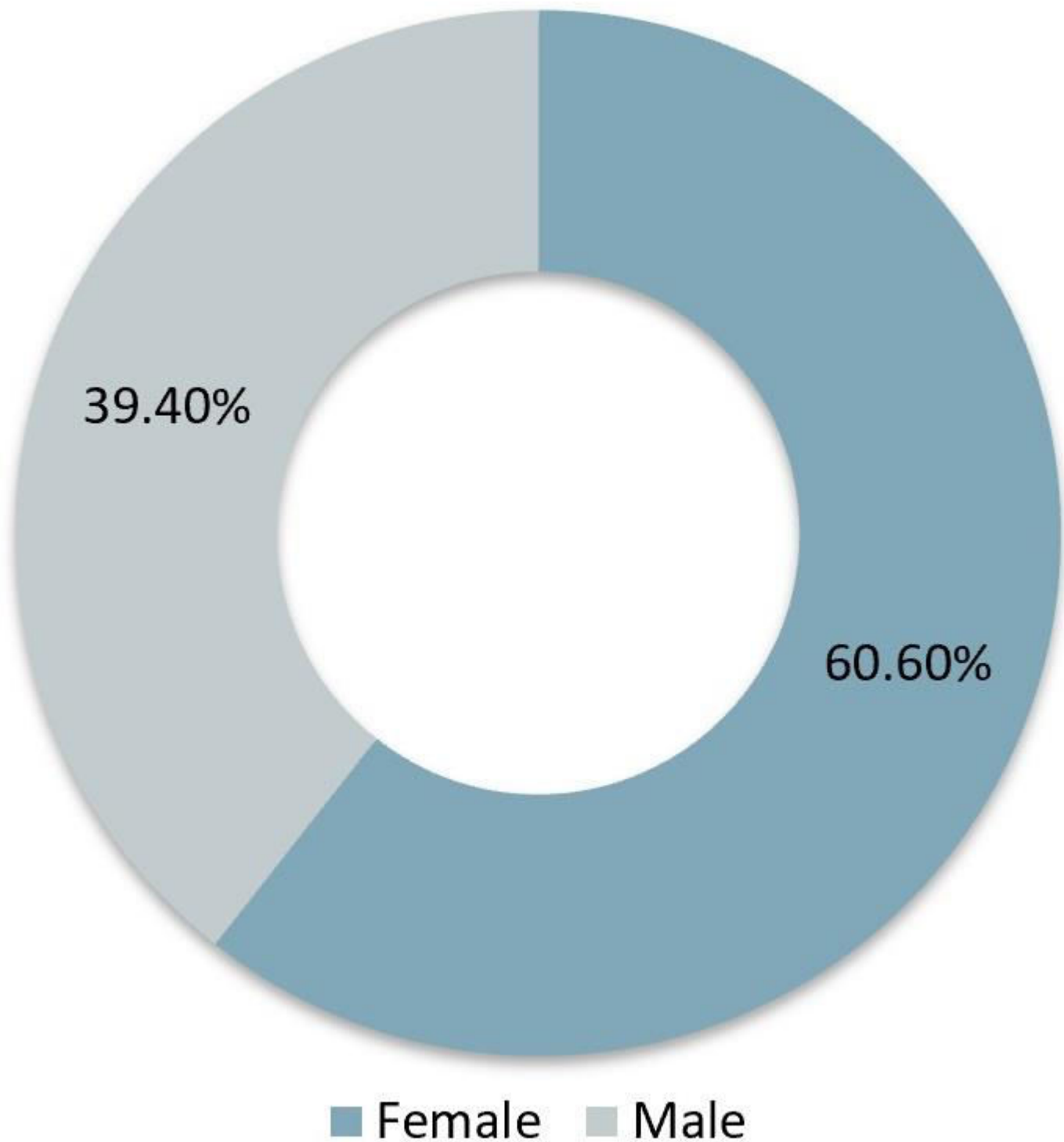
Figure 2.
Gender. N=137
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According to the age indicator, middle-aged respondents between 36 and 50 years form the largest age group in the sample (53,3%) (see Figure 4). This suggests that the Lithuanian research community in

digital humanities is of more mature age while compared to the general scientific community in Lithuania, where the majority of researchers working in the area of higher education are from 25 to 35 years old [Bumelis et al. 2014]. The latter age group of young researchers constitutes 27% of the national digital humanities community. Other age groups are represented in the sample by smaller proportions: senior researchers from 51 to 65 years old form 14,6% of the community, while 3,6% of the respondents are young adults from 18 to 25 years old, and 1,5% are scholars over 65 years (see Figure 3).
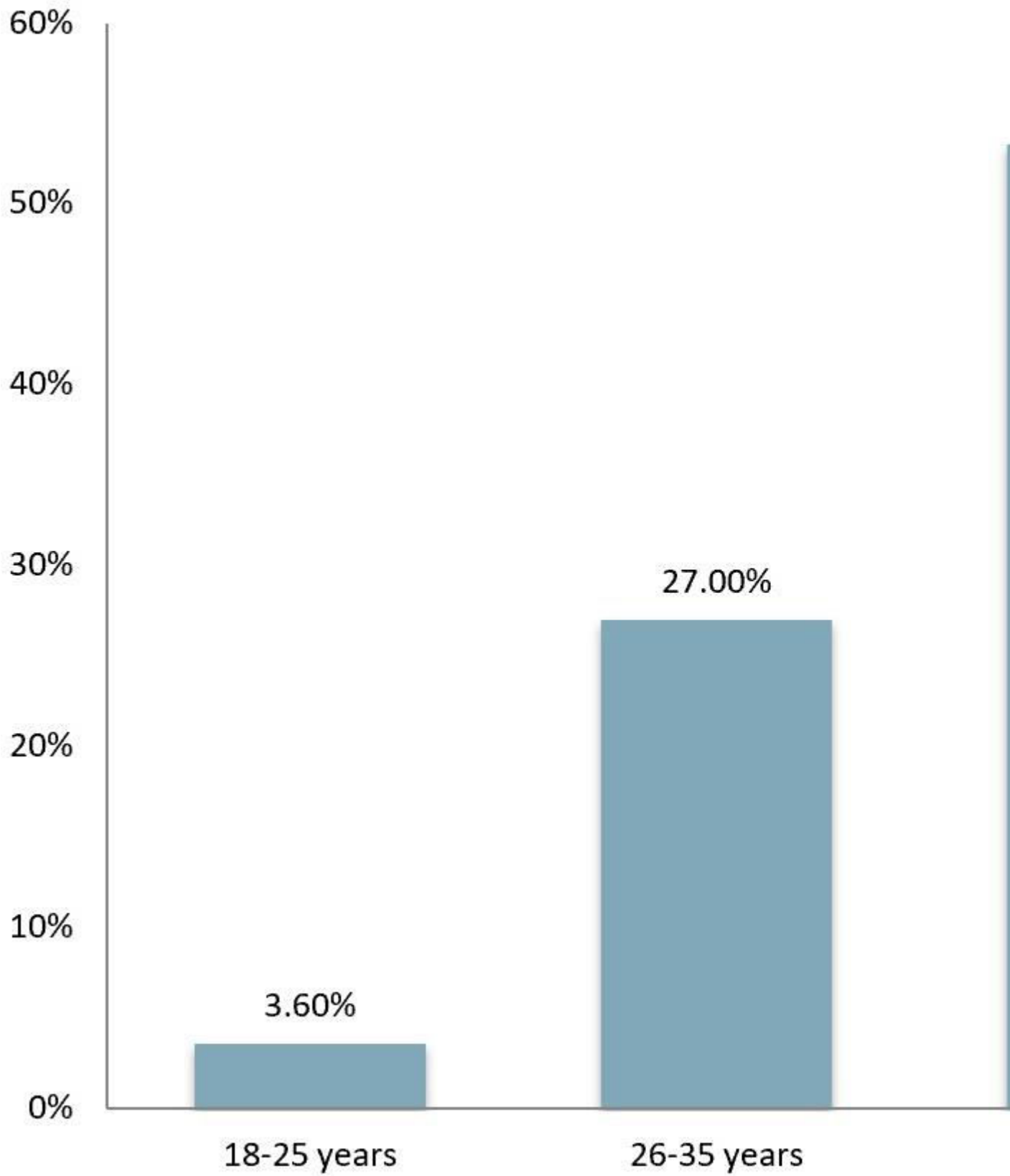
Figure 3.
Age. N=137

In addition, professional identity and background parameters were also considered in the survey. Most respondents (57,7%) confirmed being experienced researchers working for more than 10 years in research, which complies well with the age representation in the community. Another large group, represented by 29,9% of the respondents, have been engaged in research from 3 to 10 years. 8,8% of the respondents have worked as researchers for 1 to 3 years and only 3,6% of the respondents have worked as researchers for less than a year (see Figure 4).

60%		
50%		
40%		
30%		
20%		
10%		8.80%
	3.60%	

Figure 4.
Years in research. N=137

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In tandem with age and years spent in research, most of the respondents respectively defined their professional status as either senior researchers, e.g. full or associate professors (36,6%), or assistant professors and lecturers (36,4%). PhD students are also represented in the Lithuanian sample by 15,2%, while master's students, junior or contract-based, independent and post-doctoral researchers are represented in the sample by very small proportions (see Figure 5). The latter composition suggests that the community of professionally employed digitally-aware humanities researchers in Lithuania mainly consists of experienced researchers usually having tenured or tenure-track academic status, whilst there is very low representation of starting researchers holding sessional (adjunct) lecturer or post-doctoral positions. It also indicates that contract-based academic workers are offered inadequate opportunities to conduct research in this area.
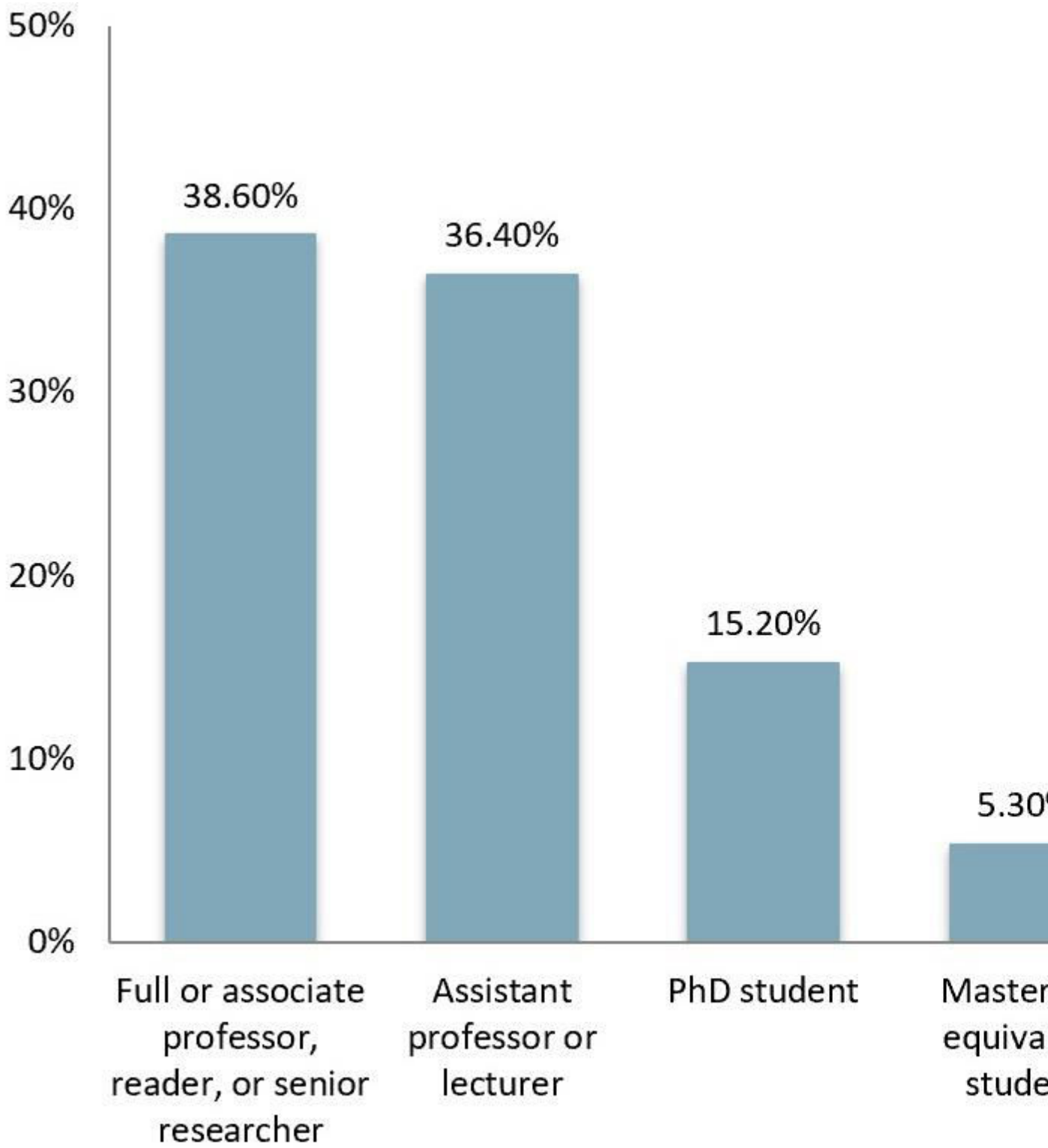
Figure 5.

Professional status. N=132

The majority of researchers (79,4%) are attached to universities, while only 14,5% of them work at research centres. Very few respondents are associated with a government department (2,3%), a private company (1,5%) or are independent researchers not attached to any institution (2,3%) (see Figure 6). The institutional affiliation suggests that much of digital research is done by academic community with universities being main facilitators of digital humanities, while other organizations or independent researchers may find less possibilities to conduct digital research projects.
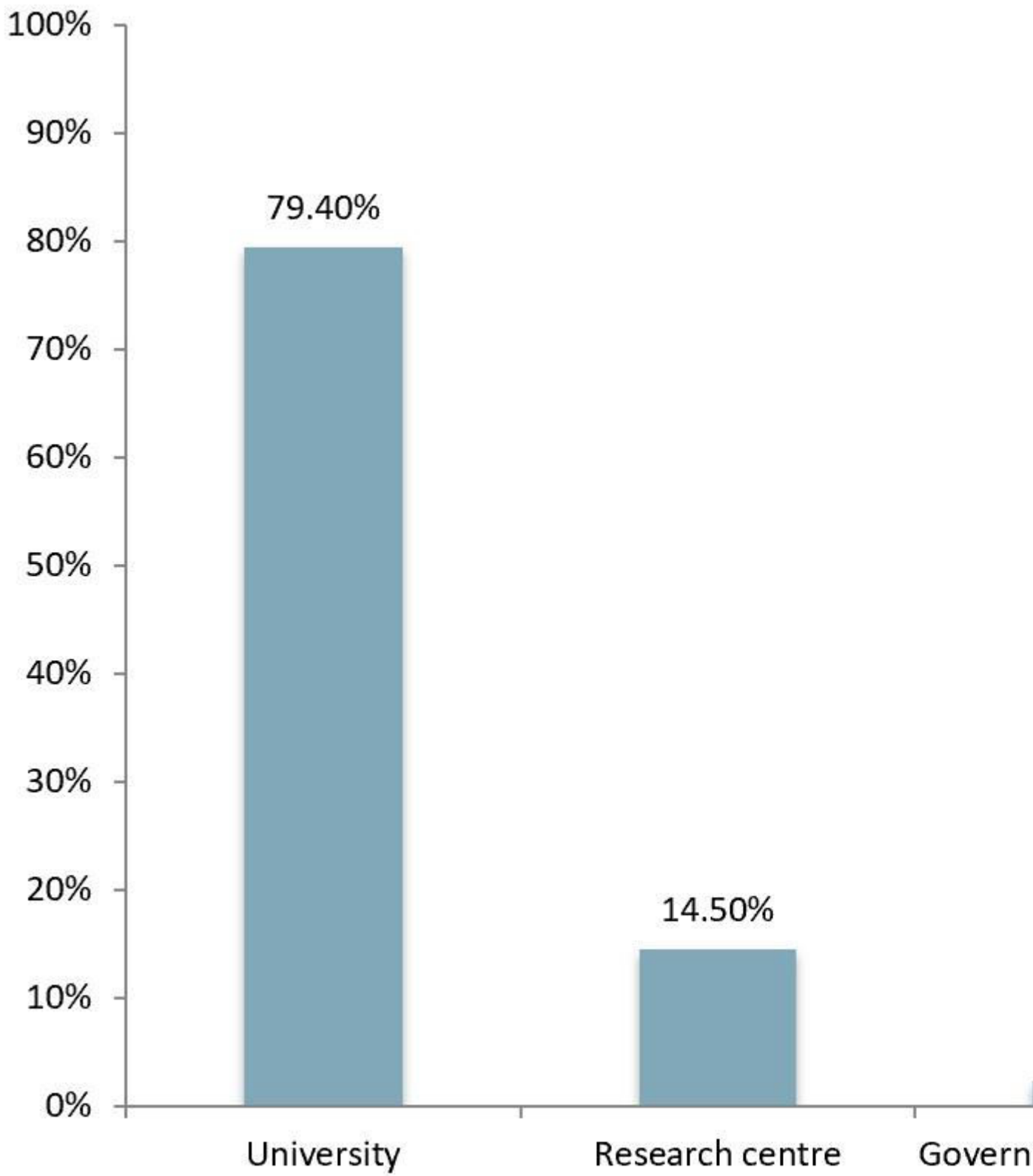
Figure 6.

Professional affiliation. N=131

The survey showed a heterogeneous representation of disciplines, as indicated by Lithuanian digital humanities researchers. However, history is the most frequently represented discipline within Lithuanian digital humanities (21,2%), followed by linguistics and archaeology, which are equally represented by 16,8% of respondents (see Figure 7). Furthermore, art, history of art or visual studies is practiced by 13,3% of researchers, while 8,9% of respondents represent language and literature-related disciplines. Traditionally, a significant leaning towards text-based disciplines, such as history, linguistics and literature, is very common in digital humanities, while the relation with archaeology is more complex even though archaeology havs been at the forefront of using ICT methods and tools [Huggett 2012]. The national composition of digital humanities disciplines complies with general trends and concurrently reveals the importance of applied research, especially in the field of archaeology, where its relation with digital humanities is difficult to track.

Other digital humanities related disciplines identified by respondents in the sample are classics, anthropology or ethnology, museum studies, ethnic, gender or cultural studies, philosophy and medieval studies, all together forming up to no more than 18% percent of the sample (see Figure 7). 5,3% of respondents specified a discipline not mentioned in the list. Some specifically mentioned disciplines not in the original questionnaire are education, and music semiotics. Other scholars emphasized their engagement in cross-disciplinary research. It is also important to note that some disciplines presented in the survey, such as drama, theatre, or performance studies music, theology or religious studies and folklore, remain missing among national responses.
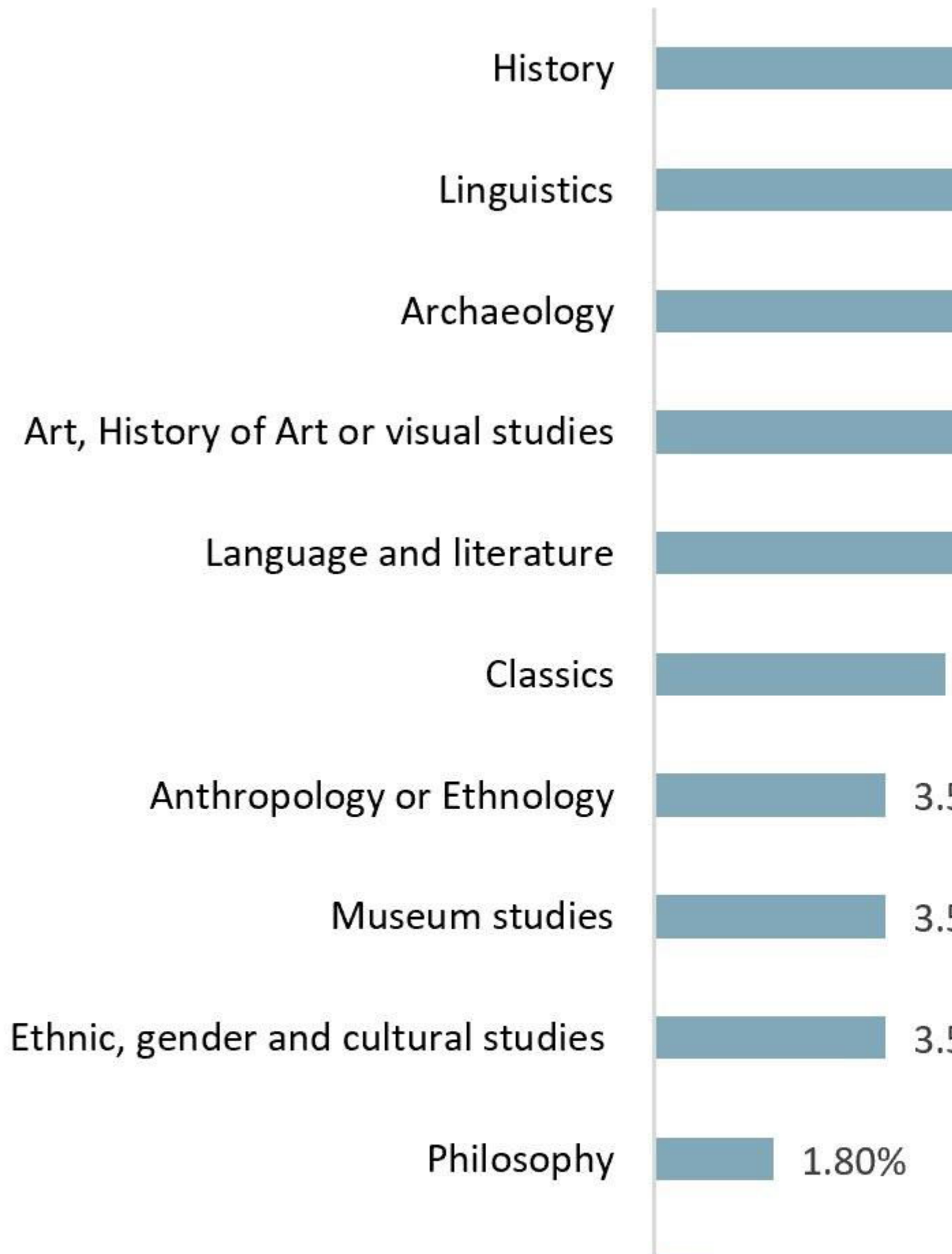
History	
Linguistics	
Archaeology	
Art, History of Art or visual studies	
Language and literature	
Classics	
Anthropology or Ethnology	3.5
Museum studies	3.5
Ethnic, gender and cultural studies	3.5
Philosophy	1.80%

Figure 7.
Discipline. N=113.

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The comparison between national and European levels[4] suggests that both scholarly communities are similar in terms of gender, age and professional status [Dallas et al. 2017]. It indicates that both communities consist of a greater number of female researchers, which is higher by 21,2% in Lithuania and 13,1% in Europe. It also shows that the larger part of digital humanists (53,3% in Lithuania and 39,5% in Europe) belong to the middle-age (36-50 years) group. Moreover, a greater majority of scholars (57,7% in Lithuania and 49,9% in Europe) are experienced researchers having more than 10 years of research experience. Universities are the main facilitators of digital research in Europe (66,50%) and even more so in Lithuania (79,4%). However, there is a greater proportion of research centers (24,30%) involved in European digital research, while in Lithuania only 14,50% of scholars reported being attached to a research center.

3. Use of digital media in scholarly work

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The application of digital methods and the use of digital technologies in research are the main indicators confirming the presence of digital humanities. One of the goals of the survey was to measure to what extent digital media is actually used in scholarly work, by asking the respondents to indicate whether they use or are interested in using digital media for their research. The interpretation of the responses in the Lithuanian context becomes even more important as there is neither an explicit definition of the national digital humanities, nor a well-established digital humanities research community supporting the field. Moreover, the digitization of heritage and scientific data in Lithuania faces major challenges, such as decentralization of national digitization activities, low level of standardization, weak interinstitutional cooperation and the lack of interoperability between different research infrastructures [Laužikas 2012]. Therefore, tracing the actual use of digital media is an important task, showcasing the prevalence of the national digital humanities field and the persistence of existing digital practices in scholarly research. As shown by the survey data the Lithuanian community of digital humanists involves not only advanced digital researchers or steady digital methods and tools users, but also includes intermediate users and digitally aware scholars. The great majority (89,1%) of scholars who responded to the survey indicated that digital technologies are very relevant in their work (see Figure 8). Herewith the majority of the community represented by 58,4% of respondents are advanced digital humanists, who acknowledged regular use of digital methods and tools in research (see Figure 8). 30,7% of respondents noted that they are interested in using digital methods or tools representing a substantial proportion of digitally-enabled or highly digitally-aware humanists, who are likely to become more persistent digital humanities researchers in the near future (see Figure 8). On the other hand, 10,9% of scholars said that they neither use, nor are interested in using digital methods or tools. The latter group of reluctant scholars cannot be determined by any particular characteristic in relation to respondents age, research discipline, etc. Thus it should be associated with lack of motivation to use digital technologies, which could be caused by different reasons. A recent study of digital humanities users [Warwick 2012] points out that humanities scholars could be very easily deterred from using digital infrastructures for numerous factors, including technical problems, complicated interfaces, poor quality of resources, incomplete content, etc. To learn new skills in order to deal with technological complexities requires persistent and highly motivated users, who appear to be only a few [Warwick 2012]. While institutional decentralization is defined as the main existing

problem in the Lithuanian arts and humanities [Laužikas 2012] it also could explain the lack of interest in using digital technologies. Separate institutions relying on individual digitization projects usually are not able to accumulate enough financial or technological resources to develop highly usable digital products, as well as to digitize vast collections or data sets that could face the needs of all scholars working in the field. On the other hand, the willingness of "digitally-reluctant scholars" to participate in the digital humanities survey also reveals a certain concern about digital humanities expressed by participants. 10,9% of theresearch community may also represent a significant proportion of digitally-aware humanists, who currently monitor digital research developments and may become potential users of digital infrastructures in the future.

Figure 8.

Interest in using digital methods or tools. N=137

The frequency of using particular devices to consult research material strongly relates to the type of material being accessed. E-publishing and online access to journals and books expands the research possibilities for scholars, and has many advantages in scope and speed over printed material. Most importantly, it welcomes new means of communication by incorporating multimedia, hypermedia or interactivity into published scholarly work. Scholarly journal publication is shifting rapidly towards electronic formats, even if it has not yet benefited in ways that online publishing in the hard and natural sciences has [Borgman 2009]. Respondents confirmed that articles in scholarly journals or conference proceedings are very much preferred in their digital form (94,2%) rather than print (30,7%). Furthermore, the vast majority of respondents mentioned videos (88,3%), images (86,1%), maps and audio (both 81,8%) as kinds of resources very often accessed digitally through PCs or laptops, and more than half of the researchers stated that they use a desktop or laptop PC to read books (67,2%) or to view archival holdings (65%) (see Figure 9).

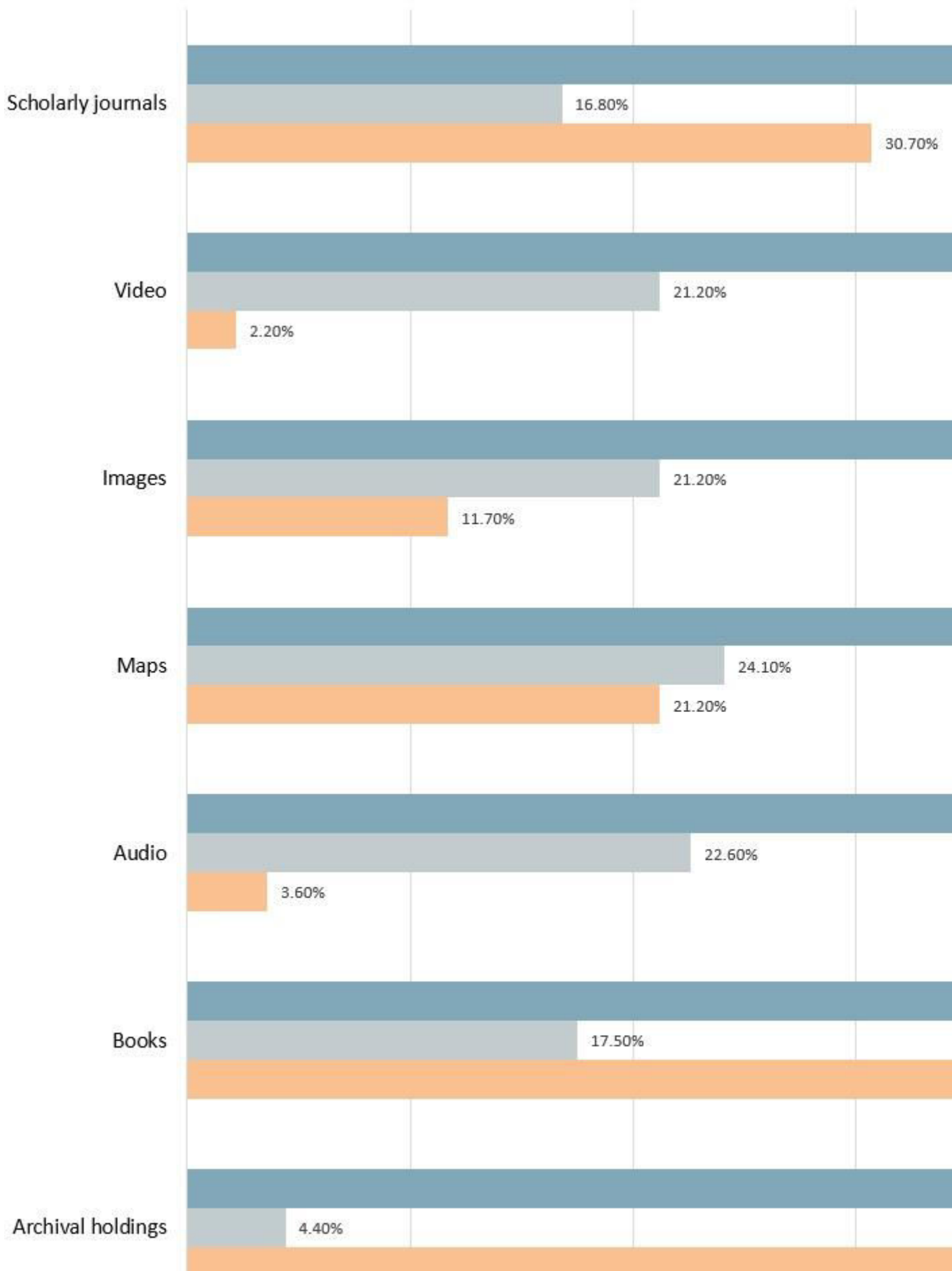| Category		
Scholarly journals	16.80%	30.70%
Video	21.20%	2.20%
Images	21.20%	11.70%
Maps	24.10%	21.20%
Audio	22.60%	3.60%
Books	17.50%	
Archival holdings	4.40%	

Figure 9.
Use of desktop/laptop PC, mobile devices and printed or analogue devices to consult research material. N=137

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It also emerges from the survey that mobile devices (e.g. tablets, smartphones, etc.) are increasingly used in research as well, even if not as widely as desktop and laptop computers. The most common kinds of research materials accessed by mobile device are maps (24,1%), audio resources (22,6%), video files and images (both 21,2%) (see Figure 9). All mentioned types of material tend to converge in the use of multimedia technologies, with mobile devices seeming to be more suitable for this purpose.

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On the other hand, print or analogue access to research materials is still widely adopted by Lithuanian scholars. Books are most often used in print form (64,2%), as well as archival holdings, which are quite commonly (46,7%) studied by using some non-digital device or form. 30,7% scholars read printed scholarly articles and 21,2% view paper maps (see Figure 9).

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The comparison between use of digital media and printed or analogue media shows that digital devices are of greater use in all cases. However, to consult books and archival holdings in print form or on an analogue device is still a common practice among researchers. On the other hand, articles in scholarly journals or conference proceedings are becoming far less commonly accessed in their printed form, while images, maps, video and audio are mainly consulted in some digital form and very rarely in printed or analogue form. The latter, and especially video and audio resources, are also more likely to be consulted on mobile devices, such as tablets and smartphones, even if these devices in general are not as widely used as desktop and laptop computers. The greater use of mobile devices to view maps, as well as audio and video material goes in line with the most recent tendency to adopt these kinds of resources in interactive cultural heritage representations by using new media and GPS based mobile applications. It also relates with an emerging interest in mobile learning that has been applied in the domain of digital heritage [Kali et al. 2014] [Read and Bárcena 2015].

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The overall usage of desktop or laptop PC in scholarly work is considered to be a primary mean to consult research material among Lithuanian digital humanists, which tallies a broader European digital humanities practice (see Figure 10).

Scholarly journals	
Images	11.70%
Video	10.30% 2.20%
Audio	14.70% 3.60%
Maps	21.20%
Archival holdings	

Figure 10.
Use of desktop or laptop PC and printed or analogue devices to consult research material among European (N=2177) and Lithuanian scholars (N=137)
29
The only exception at the European level concerns books, as in this case the use of printed books (87,60%) fairly surpasses the use digital books (62,50%) [Dallas et al. 2017]. Whereas Lithuanian respondents reported that in all cases PCs are more preferred than printed or analogue devices showing a well balanced practice in using digital (67,2%) and printed (64,2%) books. Furthermore, as shown in Figure 10, the use of printed or analogue devices is overall greater among European scholars when compared to Lithuanian digital humanists. The latter far less relies on printed or analogue devices, especially when handling images, video and audio material, while European scholars tend to use non-digital material alongside digital devices (see Figure 10). On the other hand, European researchers reported slightly more often using mobile devices, e.g. tablets, smartphones, etc., to view all kinds of material in comparison with national digital humanities community (see Figure 11).
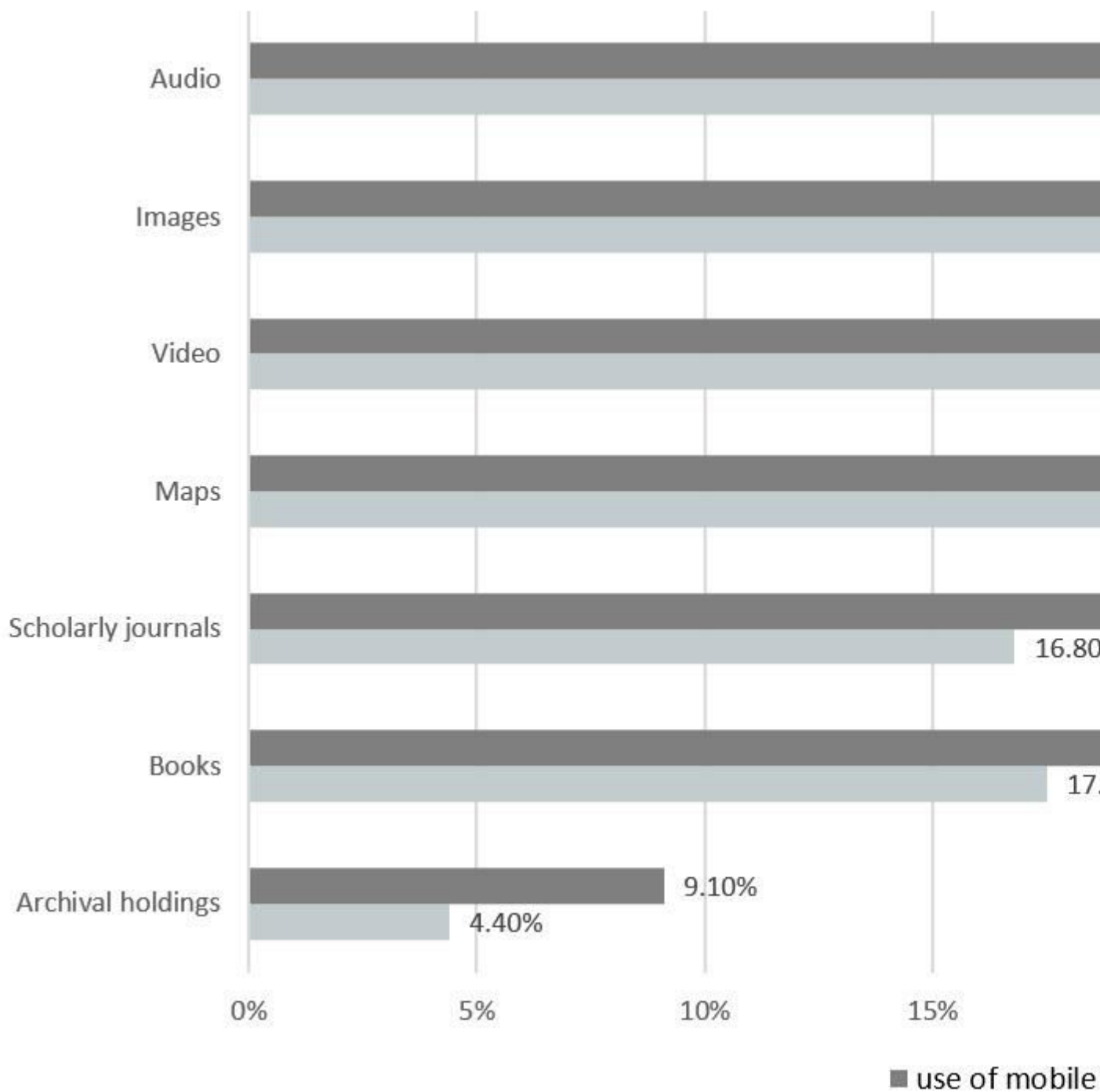
Figure 11.
Use of mobile devices to consult research material among European (N=2177) and Lithuanian scholars (N=137)

4. Identifying scholarly practices and specifying digital research methods and tools

The use of digital methods and tools is related to particular research activities and serves the precise purpose of supporting a broader process in the scholarly research lifecycle. Activity-centered models of scholarly information work focus on core scholarly activities that are common across disciplines, such as searching, collecting, reading, writing, collaborating, etc. [Palmer et al. 2009] [Benardou, Constantopoulos, and Dallas 2013]. In the survey, the respondents were presented with five major activities, or processes, representing different stages of the research cycle, such as: 1) discovery, collection and creation of research assets; 2) organization, structuration and management; 3) annotation, enrichment and curation; 4) processing, analysis and visualization; 5) publishing, dissemination and communication, and were asked to identify on which stage they usually employ digital methods and tools. As shown in Figure 12, all five suggested activities, connected with successive stages of the scholarly research process, are relevant to researchers. The initial research stage shows the highest level of digital methods and tools application. Indeed, the most frequent purpose of using digital methods or tools cited by researchers was to discover, collect or create their research assets (83,9%). Also organizing, the following stage of structuring or managing research data (76,6%), as well as processing, analyzing or visualizing research assets (the penultimate stage of scholarly research), were also very frequently mentioned as a purpose of using digital technologies (75,2%). Less frequent use of digital methods or tools is reported with regard to the middle stage (i.e. annotate, enrich or curate their research assets) and the last stage (i.e. publishing, disseminating or communicating about one's research) of the scholarly research process. However, it should be noted that over half of the respondents reported that they use digital methods or tools for all stages of the research process.

To discover, collect, or create my research assets

To organize, structure, or manage my research assets

To annotate, enrich, or curate my research assets

To process, analyze, or visualize my research assets

ˉo publish, disseminate, or communicate about my research

Figure 12.
Purpose of use of digital methods or tools. N=137
The respondents who stated that they already use digital methods and tools were also asked to specify which particular methods or tools they use. This open question allowed us to gain deeper insight in how researchers perceive the use of digital methods and tools, as well as to indicate the most popular of preferred digital methods and tools selected by researchers among broader possibilities. Responses were categorized into five groups, according to the explicit scholarly research processes related to them. Since responses comprise a mix of methods, or recurrent activities, and examples of applications mentioned together, they were separated into two groups where activities were matched with applications. The findings presented below aim to represent particular cases and provide grounded examples of individual research activities or digital methods that are relevant to research, as well as to name specific applications or tools used by digitally-aware Lithuanian humanities scholars. Some cases also take into account the frequency of occurrence of a specific response.

4. 1. Discovering, collecting or creating research assets

In order to discover and collect research assets, specific respondents stated that they access digital repositories, library catalogues or electronic text corpora covering national and international digital resources. Listed examples include well-known online repositories for searching and browsing ancient texts, such as the Perseus Digital Library [www.perseus.tufts.edu], the Thesaurus Linguae Graecae [http://stephanus.tlg.uci.edu] and the Diogenes tool [http://community.dur.ac.uk], as well as corpora in modern languages, such as the British National Corpus [http://www.natcorp.ox.ac.uk], the Corpus of the Contemporary American English [http://corpus.byu.edu/coca] and the German reference corpus [http://www.ids-mannheim.de/cosmas2] (see Table 1). National digital repositories mentioned include webpages oriented towards Lithuanistic research, such as [www.lituanistika.lt, www.tautosmenta.lt, http://donelaitis.vdu.lt, and http://coralit.lt] (see Table 1).

Discovering, collecting or creating research assets

Activity	Examples mentioned
Searching and browsing	Google, Yahoo
Access to digital repositories and library catalogues	International: academia.edu, Diogenes tool, Google Books, Google Scholar, Yahoo, Perseus Digital Library National: Lituanistika, Tautos menta
Access to electronic text corpora	International: British National Corpus (BNC), German Reference Corpus (IDS COSMAS II), the Corpus of the Contemporary American English (COCA), the Thesaurus Linguae Graecae corpora National: the Corpus of the Contemporary Lithuanian Language, the Corpus of Academic Lithuanian Language (CorALit)
Audio recording	Digital dictaphone
Digital photography	Digital photocamera
Locating	GPS and GNSS receivers, georadar, magnetometer
Photogrammetry	-

Scanning	CanonScan LiDE 500F scanner
Video recording	-
3D scanning	-
Web interviewing	-

Table 1.

Specific digital methods or tools used - Discovering, collecting or creating research assets.

33

It is no accident that web search (e.g. Google or Yahoo) and academic search engines (e.g. Google Books and Google Scholar) are widely used to discover resources on the Internet as more books, journals or other research material are digitized and could be readily accessed online. The use of web search engines (e.g. Google, Bing, Yahoo) is the most popular among researchers as 75,2% of them indicated using them very often or often (19%) (see Figure 13). Just 5,1% of respondents said that they seldom use them, while 0,7% don't use them at all. Approximately one out of two (49,6%) researchers stated very often using academic search engines (e.g. Google Scholar, Microsoft Academic Search, etc.), while 27,7% report using them often (see Figure 13). Fewer respondents could be defined as occasional users (15,3%) or non-users (7,3%)

34

Online library catalogues are also very often or often used by the great majority of researchers (82,8%). Only 17,2% of researchers said that they seldom use them, and none of them indicated that they have never used an online library catalogue.

35

Digital archives, digital collections or data repositories are used frequently by researchers, though slightly to a lesser extent than online library catalogues. 37,7% of the respondents use digital archives very often and 32,3% often (see Figure 13). 23,3% of them stated that they seldom use digital archives, digital collections or data repositories and 6,8% indicated they never use them.

36

Very similarly, online journals (e.g. JSTOR, Emerald, Springer, etc.) are used indicating that 37,9% of scholars use them very often and 31,8% often (see Figure 13). 26,5% noted that they seldom access online journals and 3,8% stated never.

37

Finally, social media sites seem not to be used by 52,2% of the respondents to discover research assets. 35,1% stated that they seldom use them, while 8,2% use them often, and only 4,5% said that they use social media sites for research purposes very often (see Figure 13).

Web se

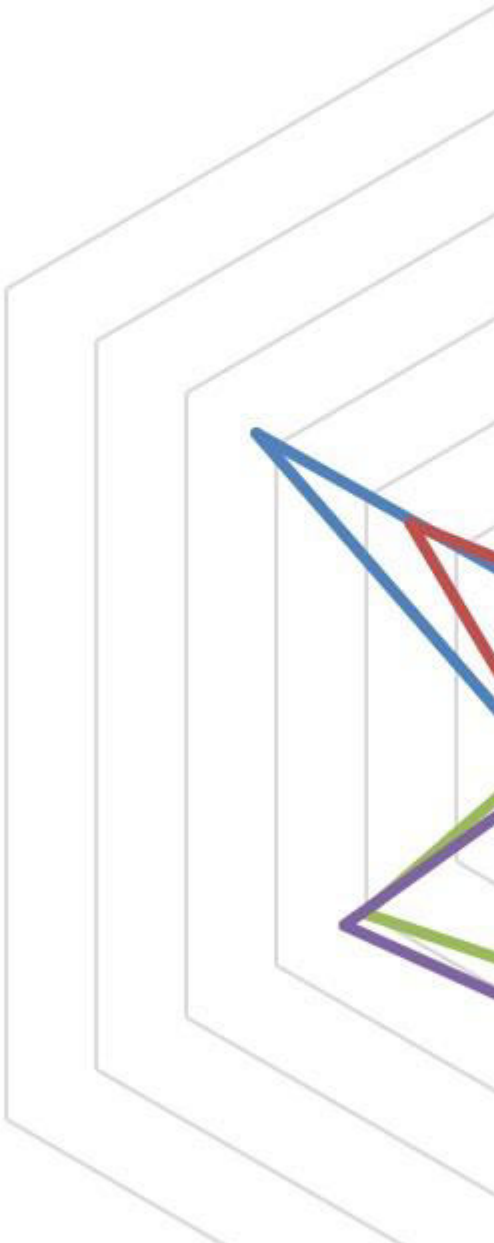Social media sites (e.g., LinkedIn, Facebook, Twitter)

Online library catalogues

Figure 13.
Frequency of use of services. N=137.

38

Another set of questions relevant to the discovery and collection of the research assets was oriented towards common scholarly activities performed during the research process, i.e.: a) visiting historical archives, special collections or museums; b) seeking information or advice from archivists, subject librarians or collection curators; and c) accessing primary sources outside one's country of residence (see Figure 14). The frequency of performing these activities was measured as an important aspect for its prevalence.

39

16% of the respondents stated that they very often or often (26,5%) visit historical archives, special collections or museums, while 41,2% stated that they visit them seldomly (see Figure 14). 16,2% of researchers never visit museums or archives during their research. Besides, assistance from an archivist, librarian or collection curator is not considered crucial in the information seeking process as usually only one of three researchers requests it (see Figure 14). Half of researchers (51,9%) rarely seek information or advice from professional assistants, while 20,7% of scholars never need it.

40

National and international sources are equally important to Lithuanian scholars for the discovery and collection of their research assets. Almost half of them indicated that they access primary sources outside their country of residence very often (11,1%) or often (37,8%) (see Figure 14). 40,7% of the respondents said that they seldom access primary sources outside their country of residence, while 10,4% rely only on national sources of information.

I visit historical archives, special collections or r

I seek information or advice from archivists, subject libr
collection curators

I access primary sources outside my country of r

Figure 14.
Scholarly activities: (1) Frequency of visiting historical archives, special collections or museums; (2) Frequency of seeking information from archivists, subject librarians or collection curators; (3) Frequency of accessing primary sources outside one's country of residence. N=137

41

Finally, for the creation of research assets, respondents named methods such as digital audio and video recording, photography, photogrammetry, 3D scanning and GPS based methods (see Table 1). The most common tools used in these activities are digital cameras, dictaphones, scanners, GPS receivers, etc. Respondents also indicated using computer-assisted web interviewing as an online research method for data collection.

4. 2. Organizing, structuring or managing research assets

42

There is a variety of online and offline computer programs that could be used to organize, structure or manage research data. The most widespread among Lithuanian digital humanists are offline tools, such as a word processor (98,5%) or spreadsheet application (75,9%) (see Figure 15). MS Excel or MS Office programs are among specifically named offline tools used for systematization of research assets (see Table 2). The latter are the most popular data management tools that have been increasingly used by Lithuanian researchers for over a decade [Laužikas 2006].
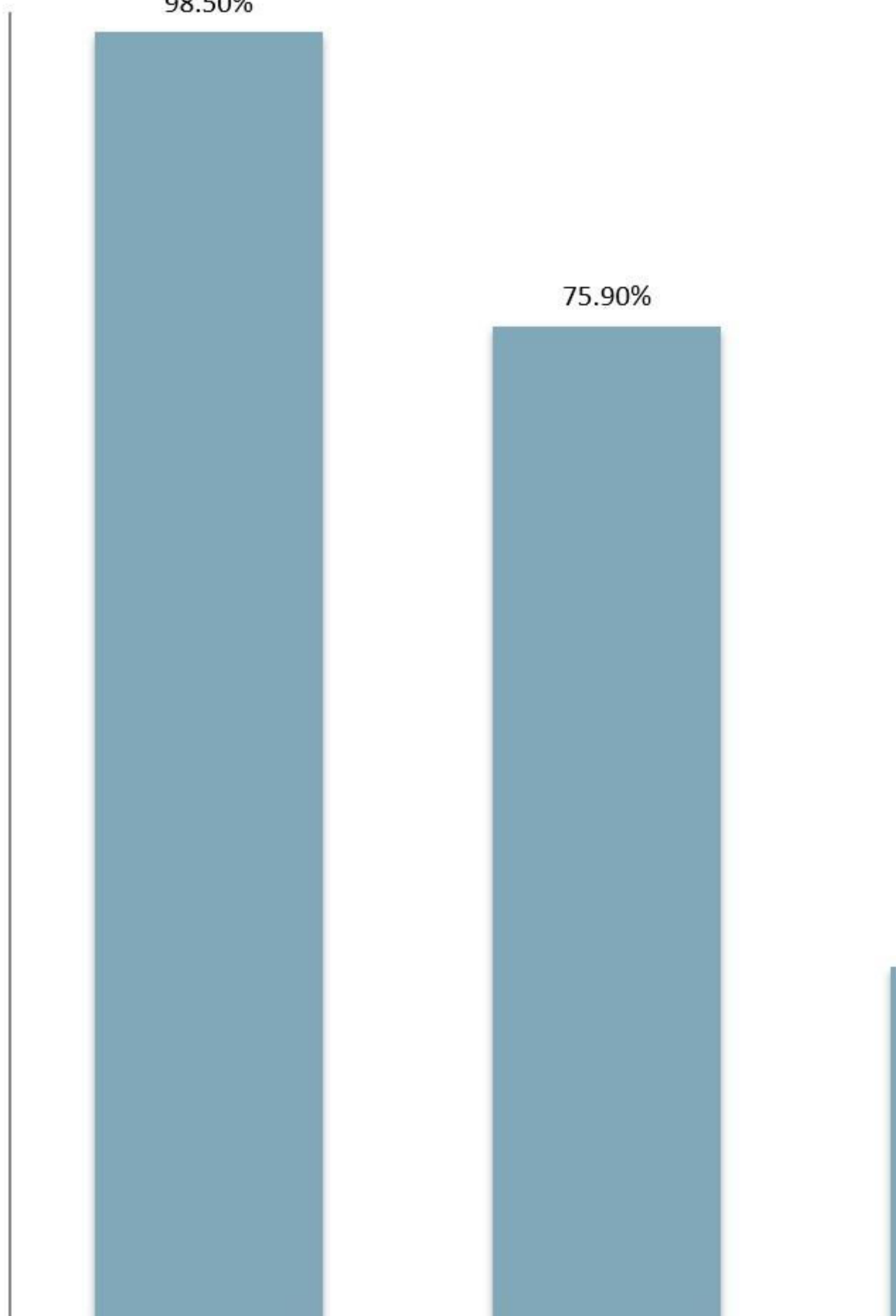
Figure 15.
Use of applications. N=137
Organizing, structuring or managing research
assets

Activity	Examples mentioned
Manage content online	WordPress
Systemize data	MS Excel, MS Office
Use of cloud based services and platforms	-
Use of databases	MS Access, WinBasp, ArcGIS
Use of GIS	-
Use of reference management software	Endnote, Zotero

Table 2.
Specific digital methods or tools used - Organizing, structuring or managing research assets.

43

The majority of the digital research community (73%) uses databases (see Figure 16) and almost one-third (27%) of it a database management system to organize, structure or manage research assets (see Figure 15). When using databases, researchers tend to choose personal databases (31,4%) over institutional databases (10,2%). However, using both personal and institutional databases is also a common practice, as one out of every three (31,4%) researchers indicated (see Figure 16).
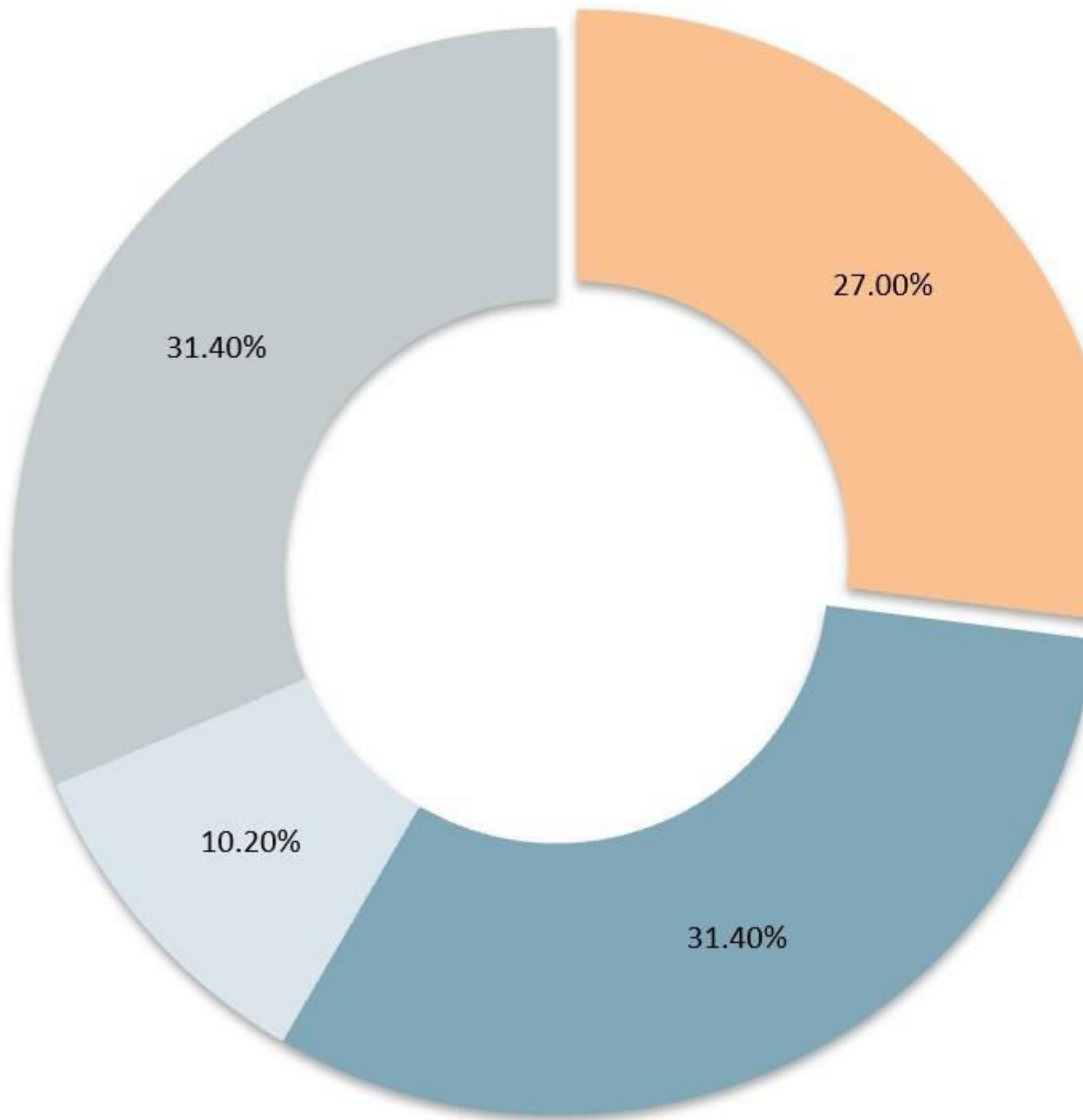
Figure 16.
Use of database. N=137.

A few more specific examples of software allowing management of digital resources in the database were named by respondents: Microsoft Access, WinBasp and ArcGIS (see Table 2). While MS Access is a very versatile software and can be applied in different areas, WinBasp and ArcGIS are software packages focused exclusively on archaeological research.

The researchers who indicated they use databases were also asked to state what kind of content is stored in their databases, among the following options: a) characteristics (attributes) of data or sources, b) textual descriptions or commentaries, c) photographs or scanned images, d) transcripts, e) maps, f) audio recordings, g) videos, and h) 3D models (see Figure 17). As indicated by survey results, research databases used by digitally-aware Lithuanian humanists most often contain textual descriptions or commentaries (86,6%), and characteristics or attributes of their data or sources (84,4%). They are also frequently used to store and manage photographs or scanned images (74,7%), as well as transcripts (69,6%). To a lesser extent, they are used to store maps (48,3%), audio (32,6%) or video recordings (32,6%). The least common kind of content in humanities research databases is 3D models (20,5%)
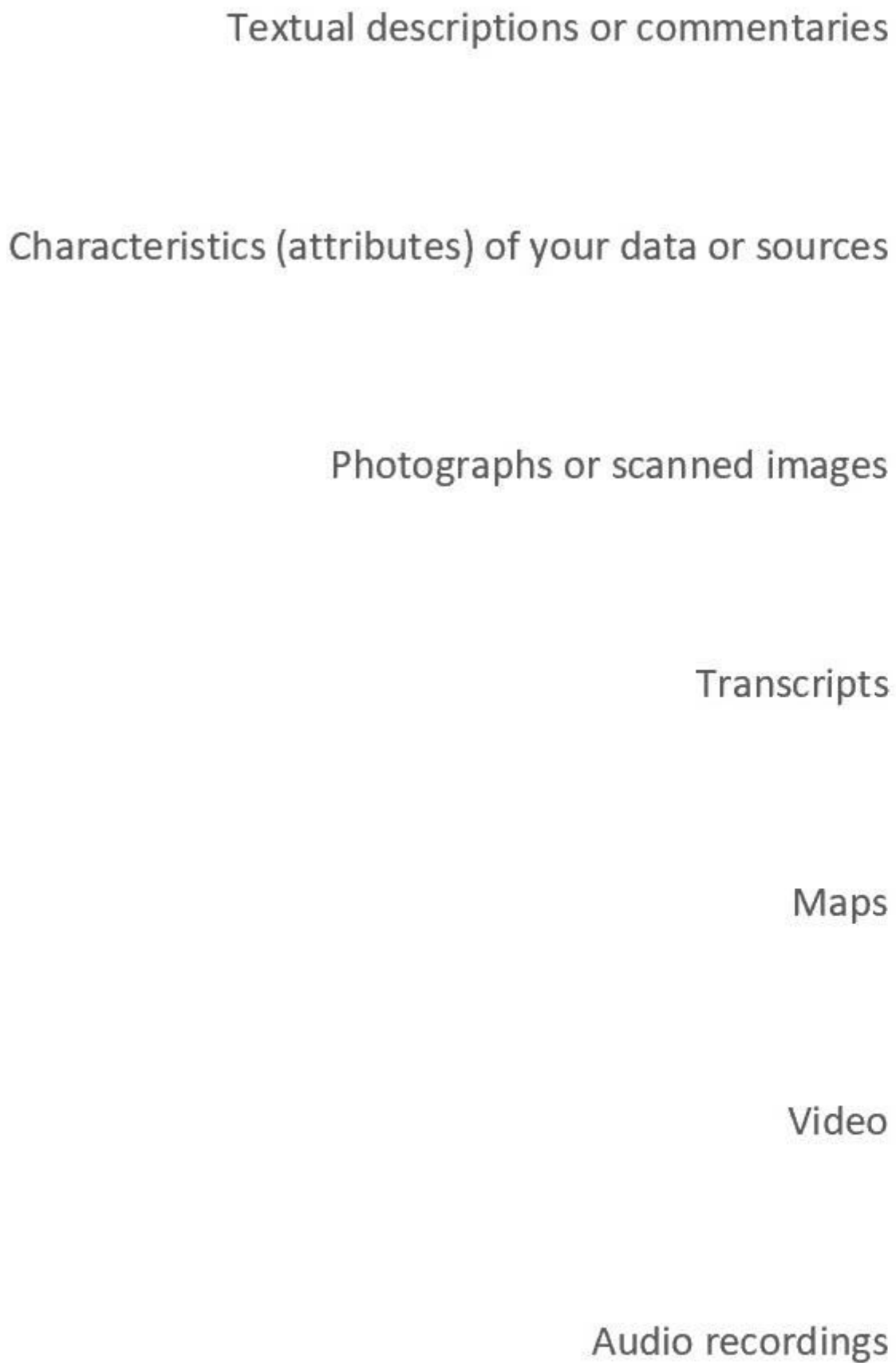
Textual descriptions or commentaries

Characteristics (attributes) of your data or sources

Photographs or scanned images

Transcripts

Maps

Video

Audio recordings

Figure 17.
Database contents. N=137
46
Additionally, researchers were also asked if they use keyword lists or thesauri to organize research assets. Overall, researchers seem to use their own keyword lists or thesauri to the same extent as standard ones, though a personal keyword list is slightly more preferable for usage (see Figure 18). 41,2% of researchers are frequent users of personal keywords and 35,4% use standard keyword lists or thesauri. However, one of three researchers report that they seldom, or never use standard or personal keyword lists or thesauri (see Figure 18). The latter fact relates to an indicated low level of standardization and lack of strategic reglementation in national research infrastructures dealing with scholarly data [Laužikas 2012]. On the other hand, a considerable number of reported use of thesauri or standard keyword lists could be associated with digital heritage research. Cultural heritage sector had adopted a national digitization strategy, which ensures more advanced development and application of standards in digitization activities [Laužikas 2012].
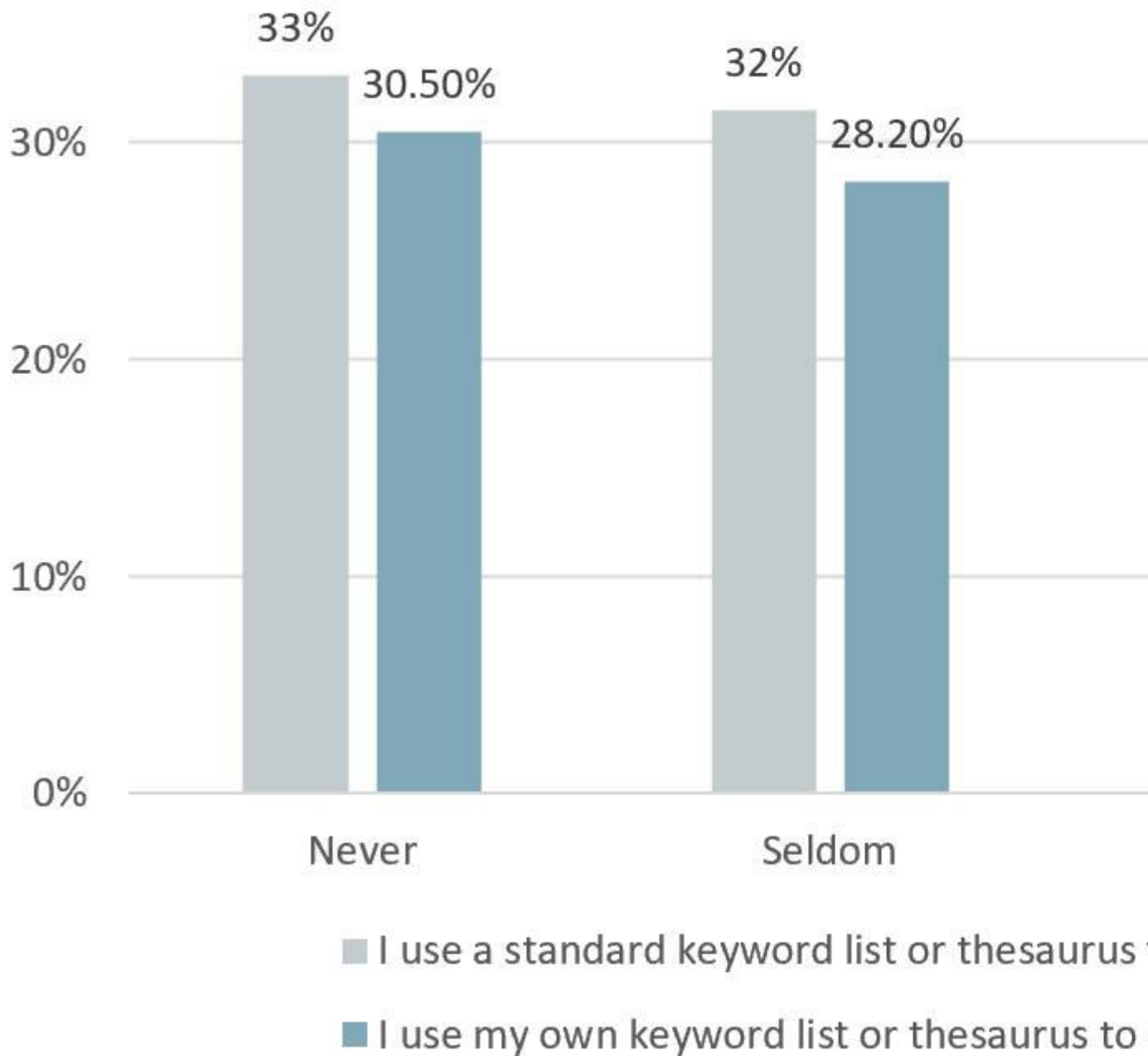
Figure 18.
Scholarly activities - Frequency of using one's own or standard keyword list or thesaurus to organize research assets. N=137

Other less common applications for research data management include note-taking programs and web-based content management systems (see Figure 15). Only 15,3% of researchers tend to take notes digitally by using reference management software, such as Endnote or Zotero (see Table 2). Cloud storage systems, services and platforms were also mentioned as being used, but only 10,9% of digital humanists mentioned using web-based applications (see Figure 15). Wordpress software was mentioned as one of the examples of online content management (see Table 2).

Finally, it is important to note that not all work done by digital humanists entirely rely on digital technologies. 43,80% of respondents mentioned using some non-digital method to organize research assets (see Figure 15).

4. 3. Annotating, enriching or curating research assets

The survey data revealed little about scholarly practices concerning annotation, enrichment and curation of the research assets. These activities also represent a middle stage of the scholarly work lifecycle, which is the least exposed to digital technology, as only half (56,90%) of researchers reported using digital methods and tools in this stage (see Figure 11). Only a few mentioned examples showcase scholarly activities, methods and tools used for these purposes (see Table 3). The respondents state that they use citation programs, such as EndNote and Zotero, to manage bibliographies and references. Sometimes scholars also choose to manage their own citations in order to measure research impact by using "Publish or Perish".

Annotating, enriching or curating research assets

Activity	Examples mentioned
Use of citation programmes	EndNote, Zotero
Measuring research impact	Publish or Perish

Table 3.
Specific digital methods or tools used - Annotating, enriching or curating research assets.

However, using a note-taking application is not very common practice among Lithuanian digital humanists as only 15,30% of respondents indicated using it (see Figure 15 above). The same applies to using a bibliographic management application whereas it is very often used by 7,5% and often used by 9% of scholars. One of five respondents (19,5%) use it seldom and the majority of respondents (63,9%) never use such an application to manage citations (see Figure 19).
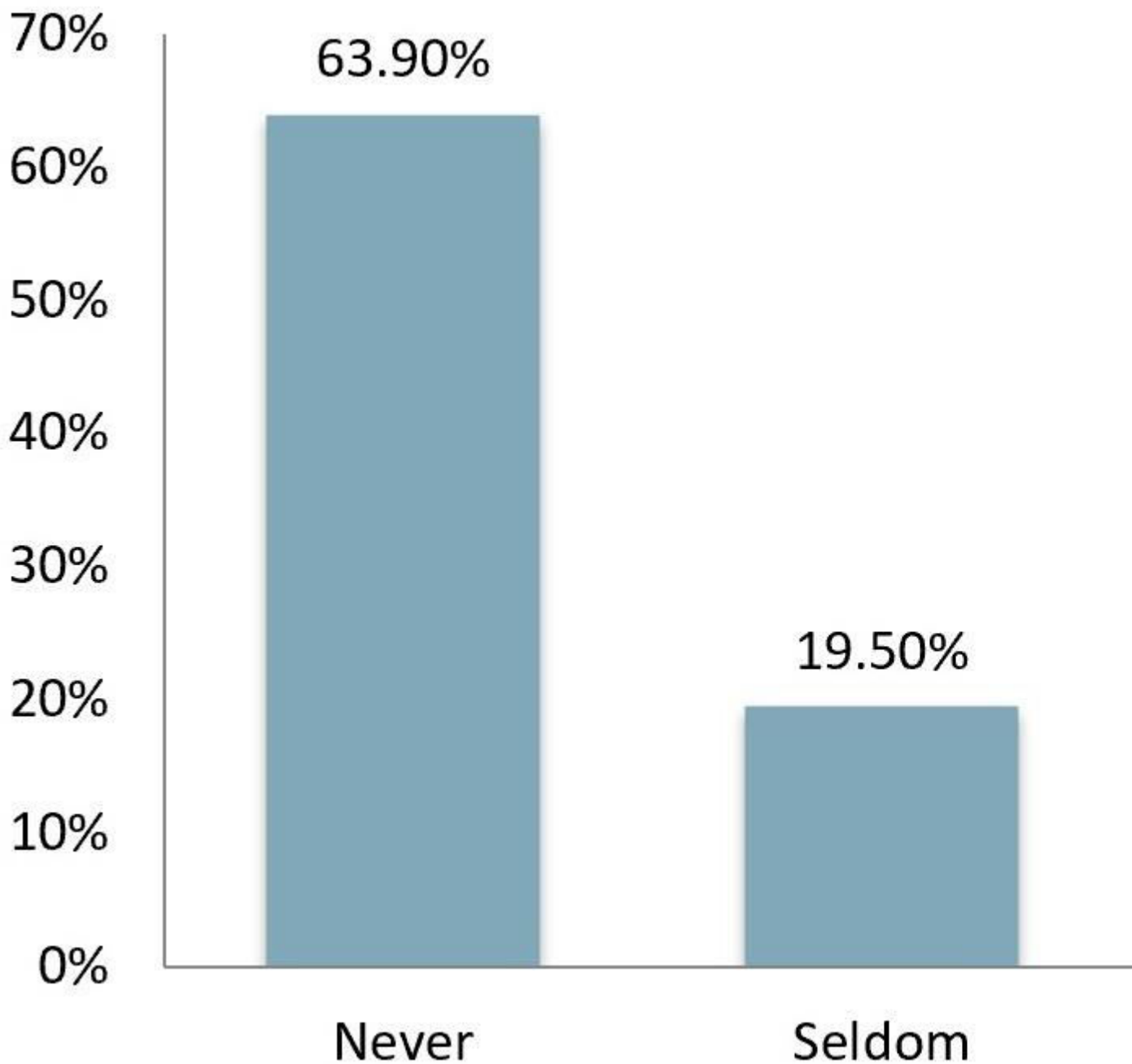
Figure 19.
Scholarly activities - Frequency of use of bibliographic management applications to manage citations. N=137

4. 4. Processing, analyzing or visualizing research assets

A wide range of activities and tools were identified by researchers when trying to describe digital practices linked with data processing, analysis and visualization. Mentioned examples mainly

concentrated on data analysis where the choice for the particular digital method or tool depends on specific data that is relevant to respondents' research field, e.g. for archaeological data analysis ArcGIS, ArcMap and WinBasp tools are used, linguistic analysis uses tools provided by AntConc and WordSmith software, and social network analysis is often implemented with Gephi software (see Table 4). On the other hand, many digital methods and tools are versatile and spread across different digital humanities disciplines. Such examples include qualitative, quantitative, comparative, computational, statistical, web analysis, etc. and a list of appropriate tools that allow to process data, e.g. MS Excel, MS Word, Loglet, Mathcad, HAMLET, MAXQDA, PSPP, SPSS, OriginLab, Google Analytics, etc. (see Table 4). Other activities to process research data include programming, transcribing, audio and video editing. Some of them also mention tools used for these purposes, e.g. online keyboard TypeIt for phonetic transcription or Adobe Premiere Pro and Videopad software – for video editing (see Table 4). The visualization of data, including drawing and 3D visualization, is another important activity mentioned by researchers. The most common image processing tools are Adobe Illustrator, Adobe Photoshop, CorelDRAW and AutoCAD (see Table 4).

Processing, analyzing or visualizing research assets

Activity	Examples mentioned
Archaeological data analysis	ArcGIS, ArcMap, WinBasp
Comparative analysis	MS Excel
Computational analysis	Loglet, Mathcad, MS Excel
Correspondence analysis	-
Data processing	MS Excel, MS Office
Data visualization	ArcGIS, MS Word
Drawing	CorelDRAW
Geo-data analysis	ArcGIS, ArcMap
Image processing	Adobe Illustrator, Adobe Photoshop, CorelDRAW
Linguistic analysis	AntConc, WordSmith
Programming	-
Quantitative and qualitative data analysis	HAMLET, MAXQDA, PSPP
Semantic text analysis	-
Serialism	-
Social network analysis	Gephi
Sound analysis	-
Statistical analysis	SPSS, OriginLab
Transcribing	TypeIt
Video analysis	-
Video editing	Adobe Premiere Pro, Videopad
Web analysis	Google Analytics
3D visualization	AutoCAD

Table 4.
Specific digital methods or tools used - Processing, analyzing or visualizing research assets.

4. 5. Publishing, disseminating or communicating about research

52

With reference to the scholarly research cycle, 59,10% of digital humanists use digital methods and tools that enable research publication, dissemination or communication (see Figure 12 above). Mentioned examples of activities are lecturing, presenting, collaborative learning, online dissemination, blogging and social networking (see Table 5). Tools contributing to these activities include Microsoft Powerpoint used for lecturing or presenting and online tools, such as WordPress for blogging and social network sites, such as Facebook or Academia.edu, in supporting online communication and dissemination (see Table 5).

Publishing, disseminating or communicating about research

Activity	Examples mentioned
Collaborative learning	-
Lecturing	MS Powerpoint
Online dissemination	-
Blogging	WordPress
Presenting	MS Powerpoint
Social networking	Facebook, Academia.edu

Table 5.
Specific digital methods or tools used - Publishing, disseminating or communicating about research.

53

The dissemination of scholarly work could be done by using different means, e.g. an institutional repository or portal, an open content journal, one's own website or blog and social media sites. A distinction between the latter was made having in mind an existing diversity of social media sites where dissemination is done through different ways or different kinds of content. Also, not all social media tools could be used to the same extent. Respectively a few options were suggested to respondents in order to avoid overgeneralization of social media tools. Proposed options include scholarly community sites (e. g. academia.edu, ResearchGate) (1), generic online content communities (e. g. Slideshare, Flickr, Youtube) (2) and social networks (e. g. Facebook, Twitter, Google+) (3). An important aspect of collaboration in the digital humanities community is the shift over the last two decades from a focus on the audience to participation that includes scholars, students and the general public [Borgman 2009]. Many scholars are familiar with Web 2.0 tools and social media possibilities allowing to be engaged in more profound scholarly communication and perform miscellaneous participatory activities. The use of these technologies is an important indicator showcasing the change of information behavior in the context of scholarly communication.

54

However, even with an existence of a variety of options provided by digital technologies and Web 2.0 tools, researchers still prefer more traditional means to disseminate their research results. The survey revealed that the dissemination of scholarly work in Lithuania is mostly done through an open content journal or publication (see Figure 20). 30,1% of the respondents use it very often and 36,8% of them often. 23,5% of researchers indicated using it seldom, while 9,6% of them stated they never used such means of dissemination.

55

Using the portal or repository of their institution is the second most used mean of dissemination (see). 12,5% of the Lithuanian researchers reported using it very often, while 34,4% use it often. On the other hand, the activity is seldom performed by 32,8% of the respondents and never performed by 20,3% of them.
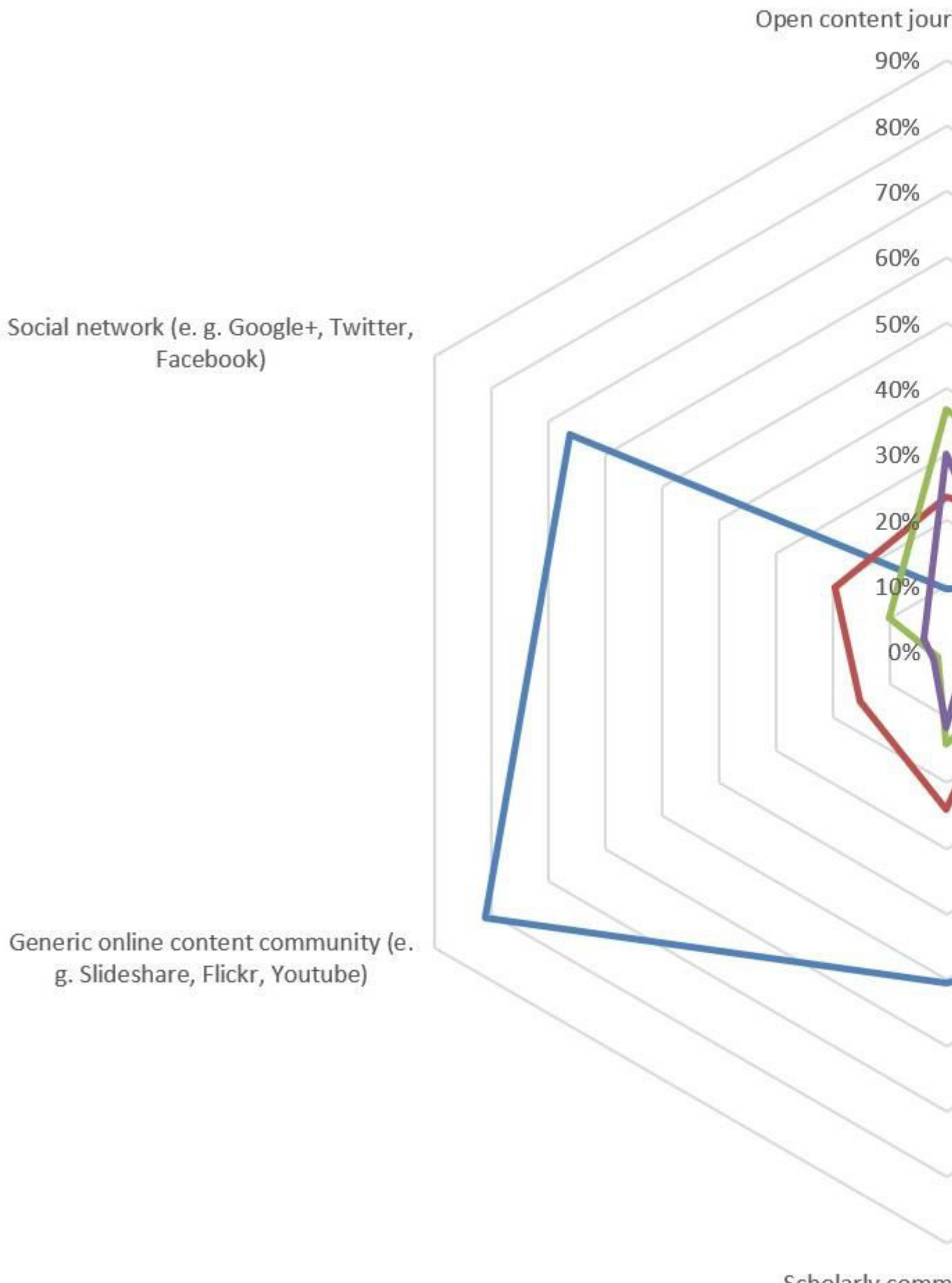
Open content jour...

90%

80%

70%

60%

50%

40%

30%

20%

10%

0%

Social network (e. g. Google+, Twitter, Facebook)

Generic online content community (e. g. Slideshare, Flickr, Youtube)

Scholarly comm...

Figure 20.
Means of dissemination of scholarly work. N=137.

56

The survey indicated that digital humanists in Lithuania are still not steady users of social media. Dissemination through a scholarly community site seems to be seldom amongst Lithuanian researchers in the humanities (see Figure 20). Scholarly community sites (e.g. academia.edu, ResearcGate, etc.) are the most popular type of social media used in research dissemination, followed by social networks (e.g. Facebook, Twitter, Google+, etc.). 11,6% of respondents are very frequent and 14% frequent users of online academic communities, while social networks are very frequently used by only 3,9% and frequently by 10,2% of researchers. One out of four (24%) researchers are occasional users of online scholarly communities and one out of five (19,7%) of social networks. However, the majority of researchers never use scholarly communities (50,4%) or social networks (66,1%) to promote research.

57

Blogs or personal websites are even less preferred in scholarly communication activities, while generic content communities are the least preferable mean of scholarly communication. Only 3,1% of respondents very often and 11% often use one's web site or blog, while content communities are accessed very often only by 2,4% and often by 1,6% of researchers. 10,2% of researchers rarely use blog sites, while 15,1% seldom share content through generic online communities. The vast majority of scholars report never using one's web site or blog (75,6%) or generic online content community (81%) to disseminate research work (see Figure 20).

58

Overall, the use of social media for dissemination purposes seems to be low in the national digital humanities as researchers prefer more formal ways of dissemination, such as journals or institutional portals. Social media usage patterns demonstrate a slow shift towards participatory and more collaborative scholarly communication, but do not indicate a breakthrough point in the community. Usually researchers with adequate Web/Web 2.0 skills have a greater variety of information practices, more choices for multi communication, and more tools in social media [Gu and Widen-Wulff 2011]. Thus a wider application of Web 2.0 technologies in national digital humanities may be expected in the future, when researchers will develop a specific set of skills and a certain level of confidence in using them.

59

Additionally, related questions were asked to gain deeper insight about digital publishing, communication and dissemination practices carried out by Lithuanian digital humanists. Researchers were asked to indicate their publishing preferences regarding scholarly work. Publishing in their native language is the priority for Lithuanian researchers as it is done by the majority (79,5%) of them. English is the most preferred second language for publishing research work as 19% of scholars stated they primarily publish in English. Only 1% primarily publish in some other language (see Figure 21). The major preference for publishing in national language and relatively low proportions of other languages used in scholarly publishing suggest that international cooperation and collaboration between researchers in digital humanities is inadequate.
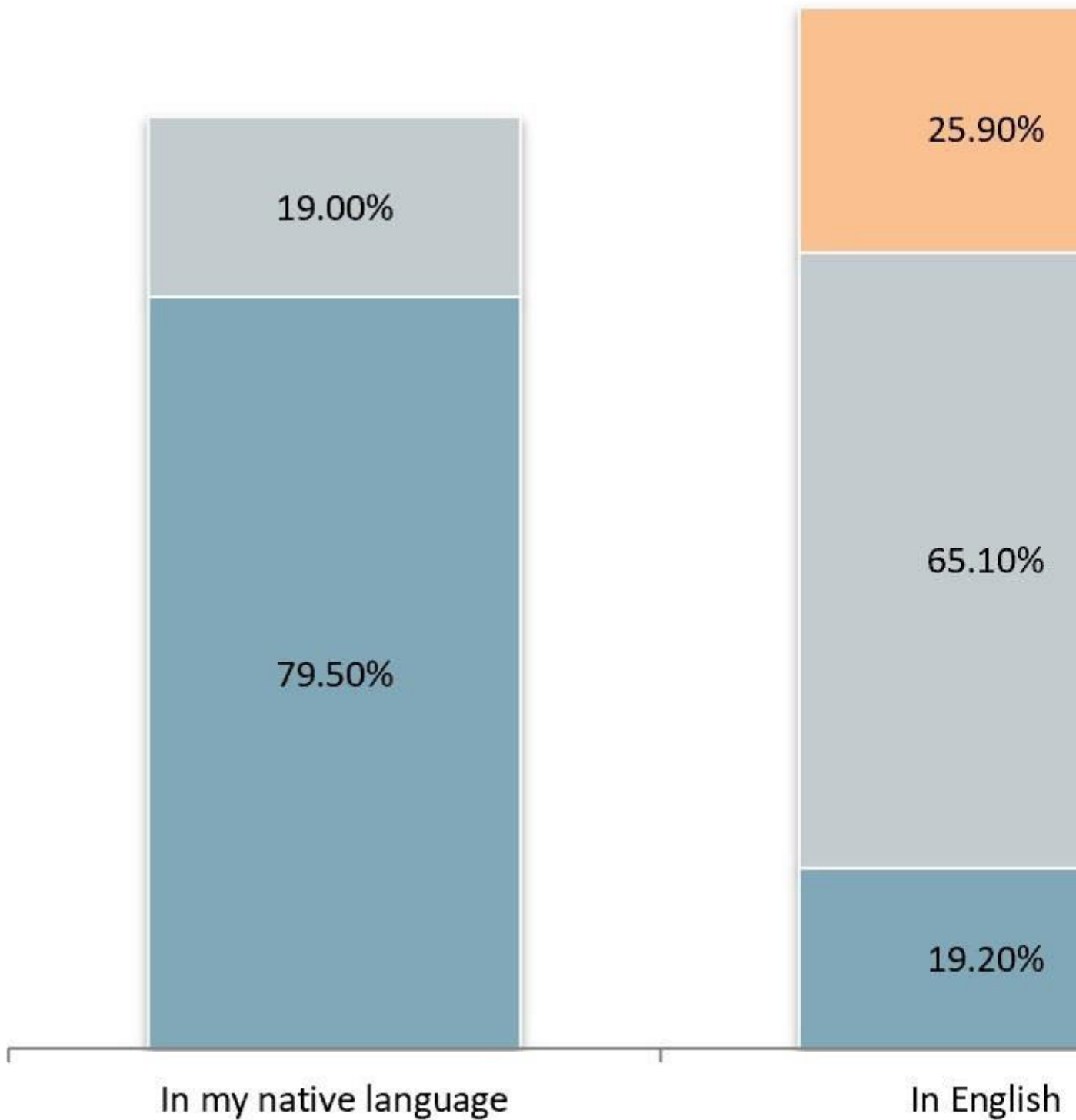
Figure 21.
Publishing language. N=137

Collaboration is one of the most important aspects relevant to the current state of digital humanities. It is known that traditional humanities still obtains an image of the "lone scholar", while digital

humanities are becoming more collaborative [Borgman 2009]. Collaboration is an effective way to produce new knowledge and could be easily and effectively done in a digital environment. Some of the Lithuanian scholars mentioned collaborative learning as part of their scholarly activities (see Table 5 above). Respondents were also asked to state how often they collaborate with others on research projects. It seems that collaboration is quite common research practice among Lithuanian scholars as 24,1% do it very often and 46,6% often collaborate with others (see Figure 22). 24,8% of respondents stated that they collaborate seldom and only 4,5% said they never collaborate with others on a research project. The results of the survey appear to contradict the conclusion presented in the "Report of the Lithuanian science state" showing a very low level of collaboration in the humanities research [Bumelis et al. 2014]. However, as noted by the report authors themselves, the estimations were made according to the index of co-authored publications, which deals with an objective and easily measured data, but it does not take into account other means of collaboration. An existing example like this suggests that in some cases the impact of humanities research might be nationally underestimated as present strategies on evaluating scholarly research might be questionable.
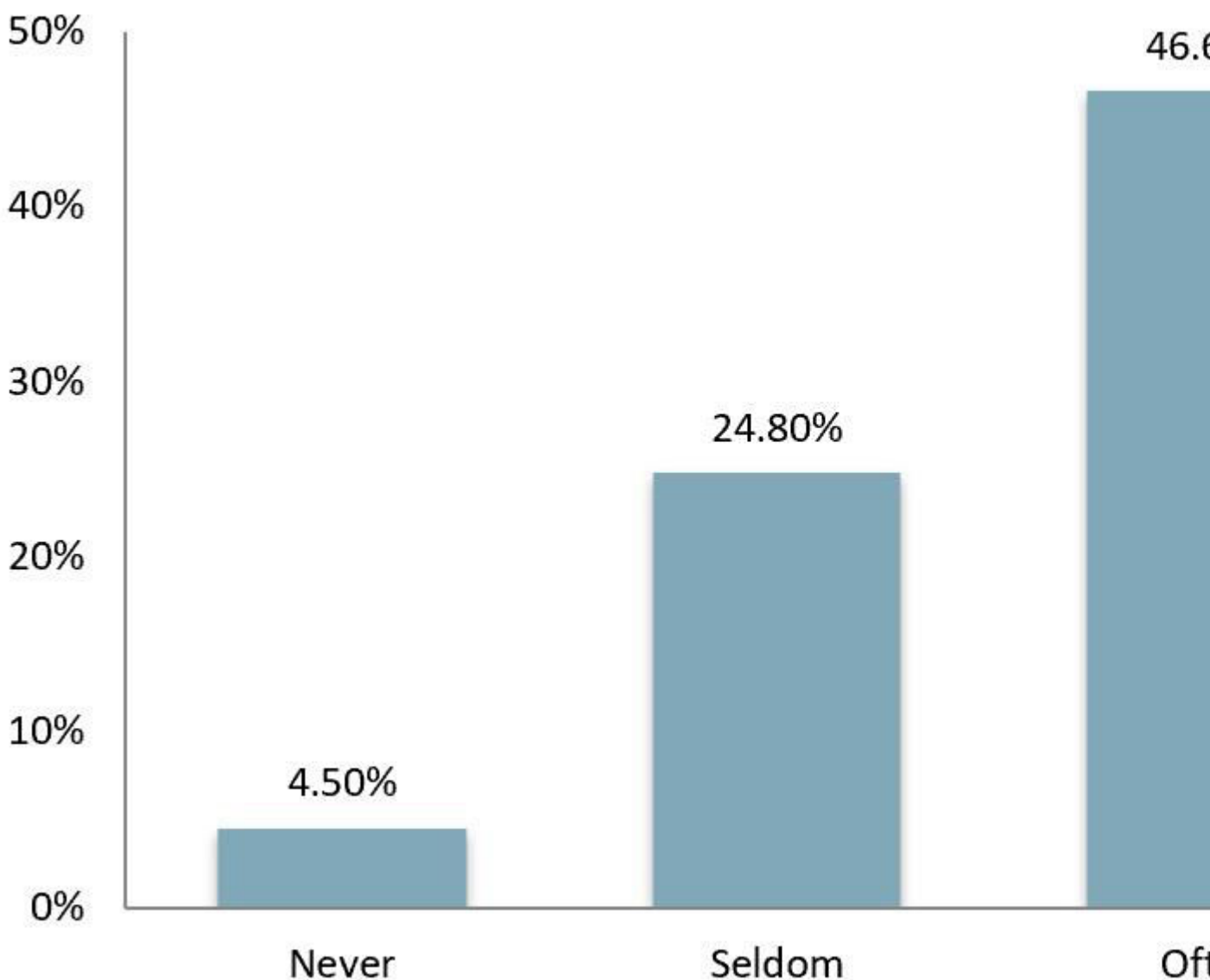
Figure 22.
Scholarly activities - Frequency of collaborating with others on a research project. N=137

Both Lithuanian and European respondents reported using digital methods or tools to support all phases of the research lifecycle from discovery to dissemination [Dallas et al. 2017]. However, Lithuanian scholars in comparison to European scholars find digital methods and tools less suitable for research annotation, enrichment or curation and much less useful for research publication, dissemination or communication (see Figure 23).
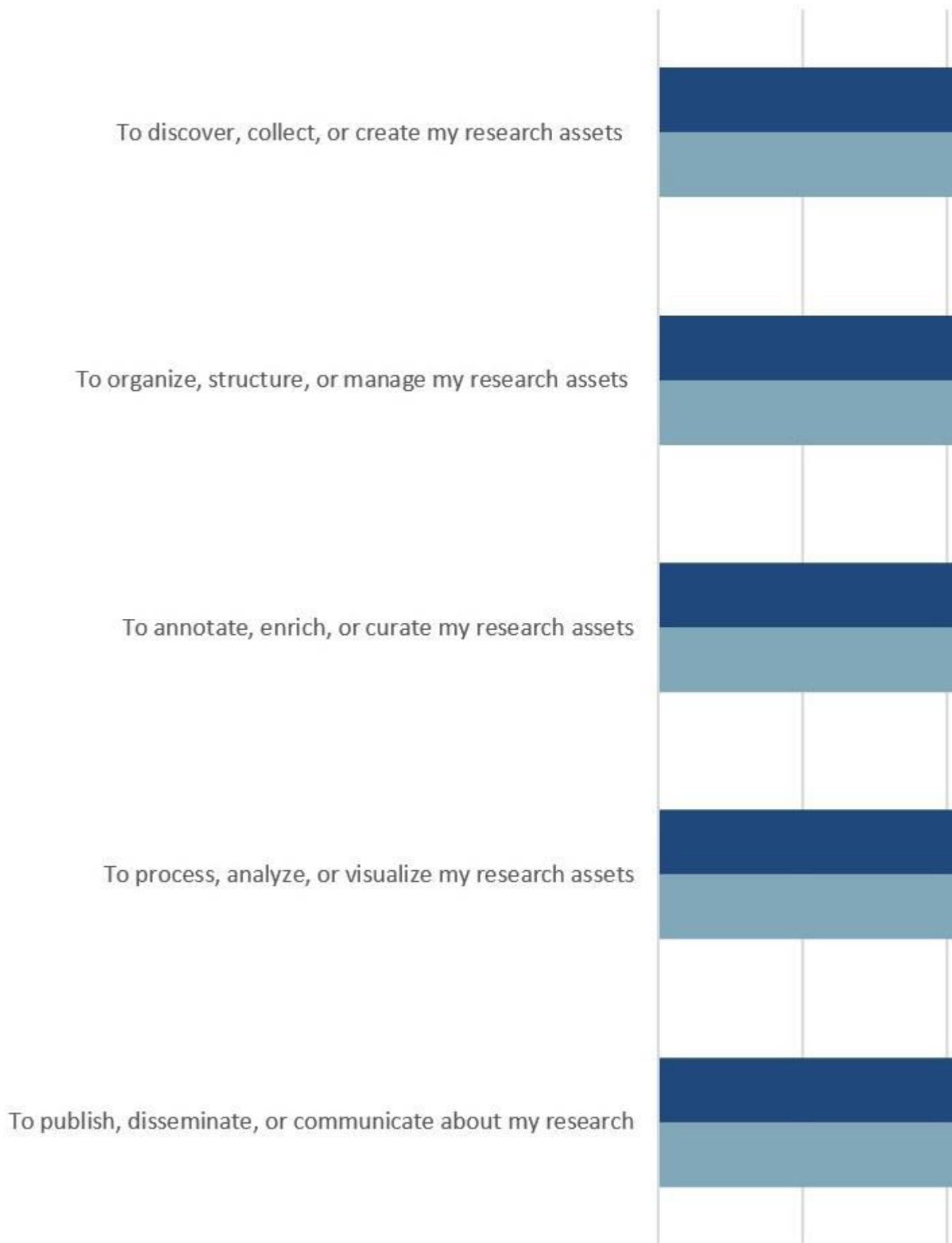
To discover, collect, or create my research assets

To organize, structure, or manage my research assets

To annotate, enrich, or curate my research assets

To process, analyze, or visualize my research assets

To publish, disseminate, or communicate about my research

Figure 23.
Purpose of use of digital methods or tools among European (N=2176) and Lithuanian scholars (N=137)
62
The comparison of latter activity at European and national levels revealed that European scholars generally are more keen to use innovative dissemination tools, e.g. blogs, online communities and social networks, (see Figure 24) which leads to overall greater application of digital tools during the last stage of the research cycle [Dallas et al. 2017]. Whereas Lithuanian scholars still greatly rely on "traditional" means to publish research results, e.g. scholarly journals and institutional portals, and rarely use other tools for dissemination (see Figure 24). Also, certain kinds of tools (e.g. blogs and personal websites) in this case are particularly overlooked by Lithuanian scholars (see Figure 24).

Social network (e. g. Google+, Twitter, Facebook)

Generic online content community (e. g. Slideshare, Flickr, Youtube)

Figure 24.
Very often or often used means of dissemination of scholarly work among European (N=2132) and Lithuanian scholars (N=137)
63

Another slight difference between national and European research communities was observed during the middle stage of the research cycle encompassing annotation, enrichment and curation practices [Dallas et al. 2017]. European respondents reported a higher percentage of using digital methods and tools (65,5%) when compared to national digital humanists (56,9%) (see Figure 23). Accordingly, note-taking applications (e.g. Zotero, Endnote, etc.) as one of the main digital tools, which could be used for annotation, as well as for organization of data, are twice as often employed by European (33,70%) than Lithuanian (15,30%) scholars (see Figure 26).
64

The use of digital methods and tools during other stages of the research cycle is reported to be very similar in European and Lithuanian digital humanities communities (see Figure 23 above) [Dallas et al. 2017]. However, more detailed analysis of particular practices revealed few important disparities that deserve closer attention. One of the aspects that separates the national field of digital humanities from the European dimension is the use of social media for research purposes. It concerns not only dissemination or scholarly communication, but also involves the discovery and collection of research assets. Only 12,70% of Lithuanian digital humanists very often or often seek information via social media, while almost twice as many (22,70%) scholars in Europe use it for the same purpose (see Figure 25).

Web

Social media sites (e.g., LinkedIn, Facebook, Twitter)
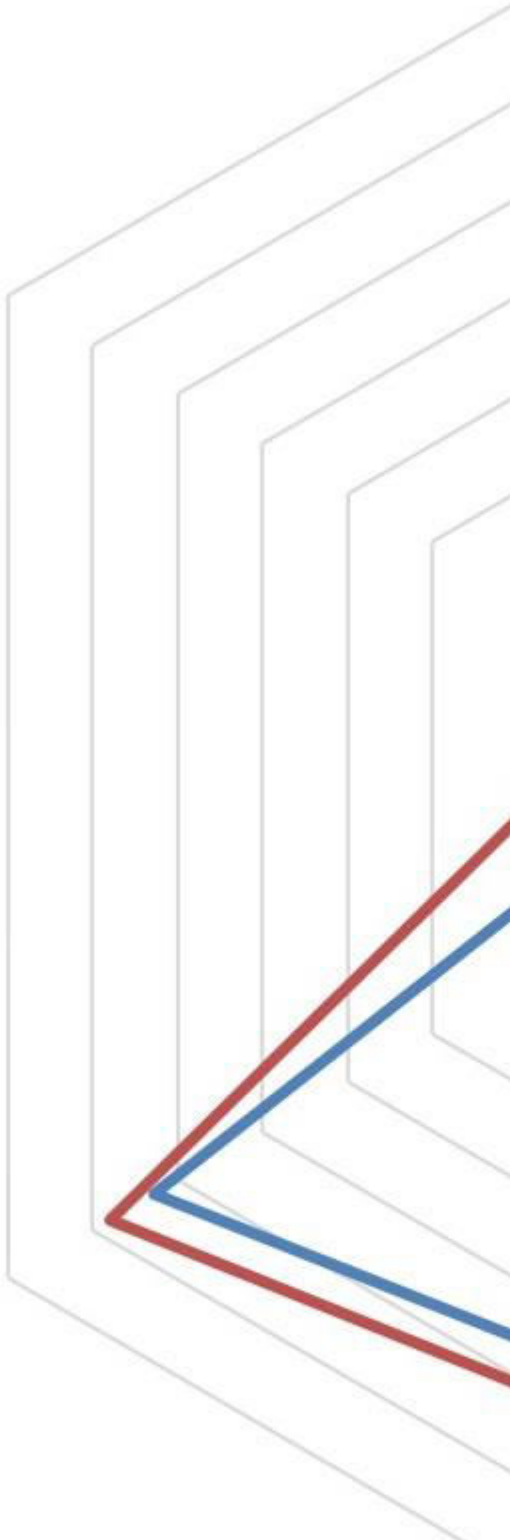
Online library catalogues

Figure 25.

Very often or often used services in discovering, collecting or creating research assets among European (N=1452) and Lithuanian scholars (N=137)

65

Similar usage patterns for both communities are traced at the second research stage concerning data organization, structuring and management [Dallas et al. 2017]. Though at this stage word processors and spreadsheet applications along with some non-digital methods are slightly more popular among Lithuanian researchers, while European scholars tend to use database management systems, note-taking applications and web-based content management systems slightly to a higher extent (see Figure 26).
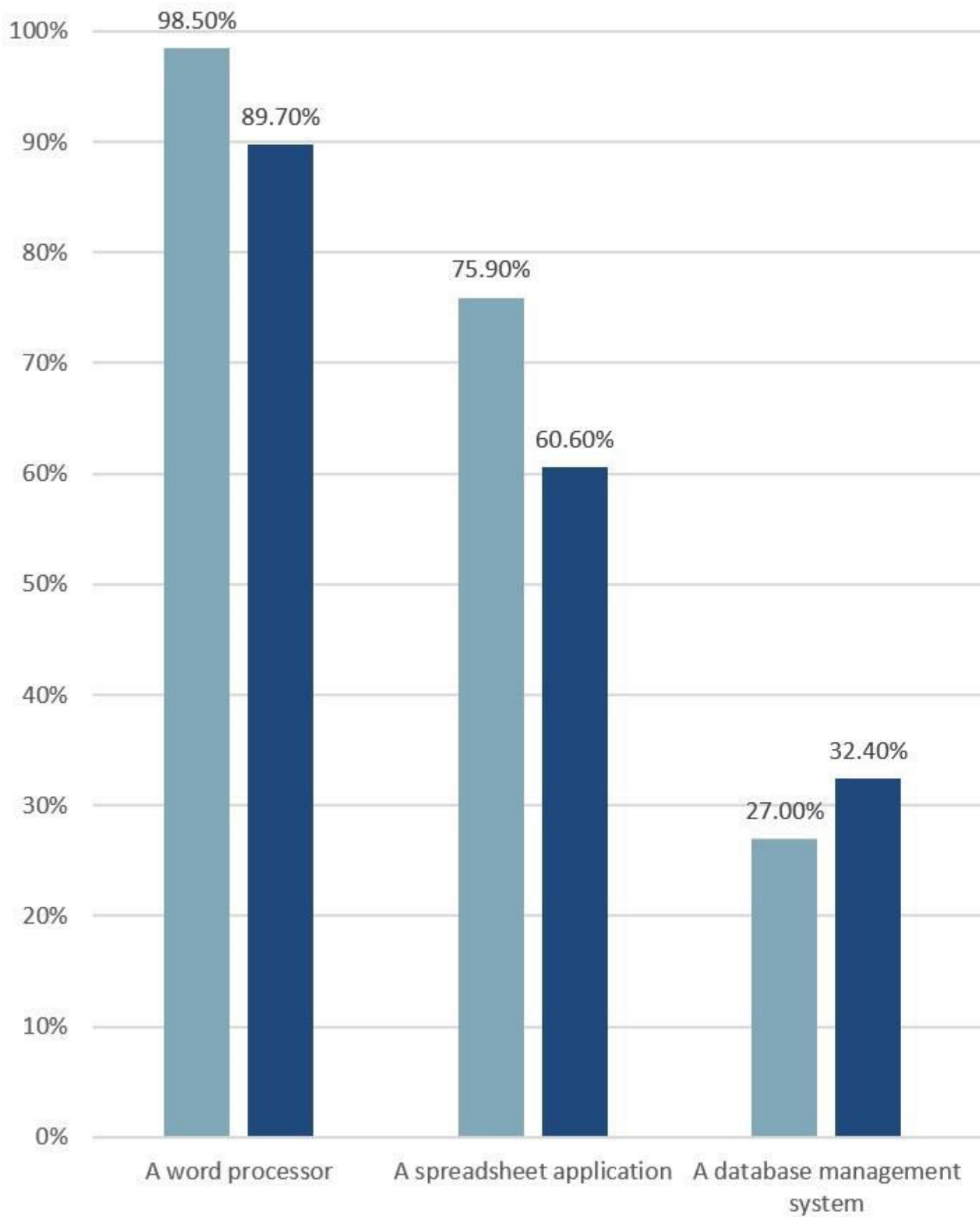
	A word processor	A spreadsheet application	A database management system
	98.50%	75.90%	27.00%
	89.70%	60.60%	32.40%

Figure 26.
Use of applications among European (N=2176) and Lithuanian scholars (N=137)

5. Assessing research needs

66

Finally, in order to better understand existing scholarly requirements for digital research, respondents were asked to rate the importance of a series of statements regarding their research needs on a scale from 1 to 10, where 1 is the least important and 10 is the most important. The survey revealed that all available statements of needs are relevant to Lithuanian digital humanists. Nevertheless, improved findability or access to existing digital research resources, having an average score of 9,2, seems to be the most important requirement for the majority of scholars (see Figure 27). Additionally, respondents also noted that digitization of research resources (av. sc. 8,6) and improved access to digital tools and software (av. sc. 8,3) are important issues for them as well (see Figure 27). It seems that the digitization of research data still remains one of the most essential requirements since 2003, seeing that the absolute majority of archaeologists (93,3%) at that time indicated the necessity to digitize research material [Laužikas 2006]. The period of 2005–2009 is considered to be a turning point in national cultural policy with an approval of strategic documents in the area of digitization, which consolidated memory institutions and fostered collaboration in national cultural heritage digitization activities [Laužikas and Varnienė 2014]. In spite of the fact that there has been a significant increase in quantitative digitization of cultural heritage resources over the last decade, the digitization of data still remains an important matter for researchers. One of the reasons leading to inefficient outcomes of digital projects is the prevalence of conservative strategic management resulting in poor quality digitization products, which do not satisfy users' needs [Laužikas and Varnienė 2014]. Moreover, as noted in the national case study of 2011 on digitization of cultural heritage and scientific data [Laužikas 2012], existing research infrastructures had accumulated digital and digitized content with great social and cultural significance, but they still require more efficient access. This could be achieved by aggregating them in a single infrastructure and by developing a more consistent national strategy for existing digital scholarly data [Laužikas 2012]. Finally, it is also important to note that digitization is a continuing activity evolving along with digital tools and software, which require ongoing development. Therefore these requirements must always be properly considered in future projects and national digitization activities.

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Another scholarly need listed among the key requirements is networking with other researchers (av. sc. 8,3) (see Figure 27). Networking or collaboration is one of the most important aspects of digital humanities, which refers to "iterative scholarship, mobilized collaboration, and networks of research" [Digital Humanities Manifesto 2.0 2009]. Rating the importance of scholarly networks revealed that Lithuanian digital humanists highly regard networking, which is considered to be as important as improved access to digital tools and software.

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Online advice and information on using digital methods and tools (av. sc. 7,2), as well as technical support on digital infrastructures, tools and software (av. sc. 7,1) are also considered relevant to Lithuanian digital humanists, though the importance is to a lesser extent (see Figure 27). These indications suggest that Lithuanian scholars consider technical support and online information to be adequate or they are quite confident in their abilities to apply digital methods or tools in their research.

69

The least important needs stated by digital researchers include courses or workshops on digital humanities (av. sc. 6,6) and online support from a professional assistant (e.g. archivist, librarian, curator, etc.) to find online material (av. sc. 6,4) (see Figure 27). The latter indication confirms that Lithuanian scholars highly depend on their personal skills to navigate the complexities of digital humanities research and do not consider help "from outside" to be crucially important. One of the reasons relates to the evolution of national digital research, which at least in the field of digital archaeology was fostered by personal research interests bringing up self-taught digital humanists [Laužikas 2006]. However, the qualitative development in the national digital humanities greatly relies on professional competence-based training, which is pointed out to be one of the priorities for the national digitization strategy in 2014–2020 [Laužikas and Varnienė 2014].

Improved findability or access to existing digital research res

Digitization of research resources or data currently not

Improved findability or access to digital too

Networking with other researchers, research groups and institutions
research

Online advice and information on using digital methods and too

Technical support on digital infrastructure, too

Courses or workshops on how digital humanities methods and tools might
research

Online support from archivists, curators and/or librarians on finding materi
my research

Figure 27.
Importance of needs. N=137.
70
The assessment of digital research needs does not show a significant difference between national and European digital humanities communities both underlying the importance of improving the access to existing digital research resources, which is the key concern altogether. Other important needs for both national and international communities include the continuity of digitizing current non-digital resources, ensuring better access to digital tools or software and fostering networking among scholars and research institutions in the field of digital humanities. Minor deviations between national and European level researchers could be traced when other needs (e.g. online information, technical or professional support, digital humanities courses and workshops) are considered. In comparison, they are valued with a lower score by European researchers and more appreciated by national scholars. It suggests that Lithuanian digital humanists, who in many cases are self-taught and driven by personal motivation, place more value on the opportunity of getting professional training, as well as receiving technical support and competent assistance.

Discussion and conclusions

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The outcomes of the DARIAH survey on scholarly methods and tools suggest that the Lithuanian digital humanities community is in many ways similar to one established in Europe as they both show great similarities in research community composition, as well as in patterns of using digital methods and tools during the research process. There was no indication of any distinctive national phenomena that would significantly contradict the usual European research practice suggesting that in many ways Lithuanian digital humanities should be seen as an integral part of a global practice enabled by digital technologies that crosses disciplinary and geographical borders.
72
As seen from the national response sample, which composes 12,4% of all Lithuanian scholars in the humanities, digital humanists vary in their abilities to effectively apply digital methods and tools in scholarly work, and most probably to understand particular aspects of digital research itself. Whereas the majority of the community (58,4%) are considered to be advanced digital humanists, who indicated using digital methods and tools on a regular basis, a substantial proportion of scholars (30,7%) should be perceived as digitally-enabled humanists, who tend to declare interest in digital methods and tools instead of constant usage. Furthermore, despite the fact that nowadays it's hard to imagine research work being done without the help of a computer or the Internet, 10,9% of Lithuanian scholars expressed a reluctant attitude towards the use of digital technologies when the option of stating "I neither use, nor I am interested in using digital methods or tools" was left open. While the reluctant approach may indicate main drawbacks associated with digital technologies, it also may represent weak understanding and perception of digital methods and tools, as well as of digital humanities. The latter group of scholars represents a notable proportion of digitally-aware humanists, who admit lacking knowledge about digital research and/or does not consider themselves to be part of the digital humanities community, but judging by their responses to other questions these researchers actually use digital methods and tools in their work, though to a lesser extent. The issue of perceiving one's identity as a digital humanist is part of broader discussion focusing on existing complexities related to the definition of digital humanities, which brings down the typology and broadly conceived landscape of

digital scholarship [Svensson 2010]. However, these dimensions were out of the scope of the DARIAH survey and remains an important task for further qualitative research within the DiMPO working group.

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The use of digital media in scholarly research is widespread in national, as well as European research communities. While a desktop or laptop PC is the primary mean to consult all types of research material, mobile devices show a high potential to become an alternative medium in the future, especially for visual and interactive research data (e.g. video, images, maps, audio). On the other hand, non-digital material and analogue devices still play and important role in scholarly research as it is a common practice to use digital devices in parallel with non-digital, especially in case of viewing books and archival records. Generally, this tendency is relatively more explicit among European digital humanists, whereas Lithuanian scholars reported being far less likely to use non-digital devices, which means that there is a significant amount of digitized or born-digital research data available to the national research community.

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Digital methods and tools are used by scholars throughout the whole research cycle that starts with research data collection and ends with research results dissemination. However, it seems that digital methods and tools serve better in particular research cycle stages, which concern discovery, organization, analysis and dissemination of research data. Accordingly, a great deal of tools specifically named by researchers support the latter activities, which not only reveals the most common competencies and skills developed by European digital humanists, but also showcase a current situation of tools available on the digital research market. The main drawback in this case is digital annotation, enrichment and curation tools that serve the intermediate stage of the research cycle, which opens a discussion on the potential of developing more efficient tools enhancing the practice. In fact, as noted by the study on scholarly annotation "established Humanities Computing (HC) areas of interest, do not seem always to connect with the actual process of the research work being carried out by most humanists" [Bradley and Vetch 2007].

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It is important to note that the main difference between the European and national scholarly communities occur in the last stage of the research cycle, which concerns publishing, dissemination and communication of research results. National digital humanists are less keen on using digital methods and tools, and are still accustomed to long-established research dissemination practices. Moreover, the use of social media for research purposes seems to be particularly underestimated by Lithuanian scholars. Social media as an innovative communication and dissemination tool has been increasingly employed by individuals and business companies over the last decade, and the overall use of social media by Lithuanian enterprises takes a median position among the European Union countries ["Social media – statistics" 2016]. A national study of scholarly communication facing these concerns could provide insights on the issue of innovative communication and help to ensure better preservation, quality and outreach of Lithuanian digital humanities research results in the future.

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The DARIAH survey should be seen as the first attempt to gather comprehensive evidence-based results on the scholarly work done by Lithuanian digital humanists, and provided accurate and measurable data to keep abreast of scholarly needs and current state of the art. It also pointed out particular areas of concern that may require more thorough investigation, which could be done by carrying on multi-case studies or other types of qualitative research to gain a proper understanding of underlying reasons, attitudes and motivations concerning digital humanities research.

Notes

[1] The translations in French, German, Greek, Lithuanian, Polish, Serbian, Slovenian and Spanish were provided by VCC2 participants and representatives of DARIAH participating countries.
[2] Kaunas University of Technology, Klaipėda University, Lithuanian Academy of Music and Theatre, Lithuanian University of Educational Sciences, Šiauliai University, Vilnius Academy of Arts, Vilnius University, Vytautas Magnus University.
[3] Centre of Regional Cultural Initiatives, The Institute of Lithuanian Language, The Institute of Lithuanian Literature and Folklore, The Lithuanian Institute of History, The Lithuanian National Culture Centre.
[4] The generalization of results at the European level was obtained by summarizing DARIAH survey responses from ten European countries, i.e. Austria, France, Germany, Greece, Ireland, Lithuania, Poland, Serbia, Slovenia and Switzerland.

Works Cited

"Social media – statistics" 2016 Social media – statistics on the use by enterprises (2016). http://ec.europa.eu/eurostat/statistics-explained/index.php/Social_media_-_statistics_on_the_use_by_enterprises
AHDS Projects and Method Database 2004 AHDS Projects and Method Database (2004). http://www.ahds.ac.uk/about/projects/methods-db/
Benardou, Constantopoulos, and Dallas 2013 Benardou, A.; Constantopoulos, P.; Dallas, C (2013). "An Approach to Analyzing Working Practices of Research Communities in the Humanities". In: *International Journal of Humanities and Arts Computing*, Vol. 7, No. 1–2, 105–27.
Borgman 2009 Borgman, C. L. (2009). "The Digital Future Is Now: A Call to Action for the Humanities". In: *Digital Humanities Quarterly*, Vol. 3, No. 4
Bradley and Vetch 2007 Bradley, J., Vetch, P. (2007). "Supporting Annotation as a Scholarly Tool — Experiences From the Online Chopin Variorum Edition". In: *Literary and Linguistic Computing*, Vol. 22, No. 2, 225–41.
Bumelis et al. 2014 Bumelis, V.; Masevičiūtė, K.; Reimeris, R.; Skirmantas, R.; Tauginienė, L. (2014). *Lietuvos mokslo būklės apžvalga*. Vilnius: Mokslo ir studijų stebėsenos ir analizės centras.
Crane, Babeu, and Bamman 2007 Crane, G.; Babeu, A.; Bamman, D. (2007). "eScience and the Humanities". In: *International Journal on Digital Libraries*, Vol. 7, No. 1–2, 117-122.
DARIAH Survey 2015 DARIAH survey on digital practices in the arts and humanities (2015). http://surveys.dcu.gr/index.php/196761/lang-en
DARIAH Working Groups 2016 DARIAH Working groups (2016). In: *Digital Research Infrastructure for the Arts and Humanities*. http://www.dariah.eu/activities/working-groups.html
DARIAH-EU 2018 DARIAH-EU (2018). https://www.dariah.eu/
Dallas and Chatzidiakou 2018 Dallas, C., Chatzidiakou, N. (2018). European survey on scholarly practices and digital needs in the human sciences. Report in preparation.
Dallas et al. 2017 Dallas, C.; Chatzidiakou, N.; Bernardou, A.; Bender, M.; Berra, A.; Clivaz, C.; Cunningham, J.; Dabek, M.; Garrido,; Gonzalel-Blanco, E.; Hadalin, J.; Hughes, L.; Immerhauser, B.; Joly, A.; Kelpšienė, I.; Kozak, M.; Kuzman, K.; Lukin, M.; Marinski, I.; Maryl, M.; Owain, R.; Papaki, E.; Schneider, G.; Scholeger, W.; Schreibman, S.; Schubert, Z.; Tasovac, T.; Thaller, M.; Wciślik,; Werla, M.; Zebec, T. (2017). European survey on scholarly practices and digital needs in the arts and humanities: Highlights Report. http://zenodo.org/record/260101

DiRT 2016 DiRT: digital research tools (2016). http://dirtdirectory.org/

Digital Humanities Manifesto 2.0 2009 Digital Humanities Manifesto 2.0 (2009). http://manifesto.humanities.ucla.edu/

Ellis 1993 Ellis, D. (1993). "Modeling the Information-Seeking Patterns of Academic Researchers: A Grounded Theory Approach". In: *The Library Quarterly*, Vol. 63, No 4, 469-486.

Gu and Widen-Wulff 2011 Gu, F.; Widen-Wulff, G. (2011). "Scholarly Communication and Possible Changes in the Context of Social Media: A Finnish Case Study". In: *The Electronic Library*, Vol. 29, No. 6, 762-776.

Huggett 2012 Huggett, J. (2012). "Core or Periphery? Digital Humanities from an Archaeological Perspective". In: *Historical Social Research / Historische Sozialforschung*, Vol. 37, No. 3, 86–105.

Hughes, Constantopoulos, and Dallas 2015 Hughes, L.; Constantopoulos, P.; Dallas, C. (2015). "Digital Methods in the Humanities". In: *A New Companion to Digital Humanities*, 150–70.

Kali et al. 2014 Kali, Y.; Sagy, O.; Kuflik, T.; Mogilevsky, O.; Maayan-Fanar, E. (2014). "Harnessing Technology for Promoting Undergraduate Art Education: A Novel Model That Streamlines Learning between Classroom, Museum and Home". In: *IEEE Transactions on Learning Technology*, Vol. 7, No. 99, 1-13.

Kirschenbaum 2012 Kirschenbaum, M. (2012). "What Is Digital Humanities and What's It Doing in English Departments?" In: *Debates in the Digital Humanities*. http://dhdebates.gc.cuny.edu/debates/1

Laužikas 2006 Laužikas, R. (2006). *Archeologija ir muzeologija: komunikacijos skaitmeninėje erdvėje taikomasis modelis*: daktaro disertacija: humanitariniai mokslai, komunikacija ir informacija (06H). Vilnius, 2006.

Laužikas 2012 Laužikas, R.; Vosyliūtė, I. (2012). "Kultūros paveldo ir lituanistinių mokslo duomenų skaitmeninimas Lietuvoje: 2011 metų situacija". In: *Informacijos mokslai*, Vol. 60, 96 – 115.

Laužikas and Varnienė 2014 Laužikas, R.; Varnienė, R. (2014). "Paveldas ir visuomenė: Lietuvos kultūros paveldo skaitmeninimo strateginės plėtros gairės 2014 – 2020 metų programavimo laikotarpiui". In: *Informacijos mokslai*, Vol. 69, 118 – 143.

Luise et al. 2016 Luise, B.; Dombrowski, Q.; Perkins, J.; Schöch, C. (2016). "TaDiRAH: A Case Study in Pragmatic Classification". In: *Digital Humanities Quarterly*, Vol. 10, No. 1.

Mccarty and Short 2002 Mccarty, W.; Short, H. (2002). *Mapping the field*. http://www.allc.org/content/pubs/map.html

Meho and Tibbo 2003 Meho, L. I.; Tibbo, H. R. (2003). "Modeling the Information-Seeking Behavior of Social Scientists: Ellis' Study Revisited". In: *Journal of the American Society for Information Science and Technology*, Vol. 54, No 6, 570-587.

NeDiMAH 2015 NeDiMAH: Network for Digital Methods in the Arts and Humanities (2015). http://www.nedimah.eu/

Palmer et al. 2009 Palmer, C. L.; Teffeau, L. C.; Pirmann, C. M. (2009). *Scholarly Information Practices in the Online Environment: Themes from the Literature and Implications for Library Service Development*. http://www.oclc.org/content/dam/research/publications/library/2009/2009-02.pdf

Pauliukaitė-Gečienė et al. 2016 Pauliukaitė-Gečienė, Ž.; Dunauskas, S.; Jakštas, G.; Jaujininkas, V.; Juknevičius, T.; Masevičiūtė, K.; Ozolinčiūtė, E.; Reimeris, R.; Repečkaitė, J.; Skirmantas, R.; Umbrasaitė, J. (2016). *Lietuvos mokslo ir studijų būklės apžvalga*. Vilnius: Mokslo ir studijų stebėsenos ir analizės centras.

Read and Bárcena 2015 Read, T.; Bárcena, E. (2015). "Mobile Social Learning as a Catalyst for Cultural Heritage". In: Proceedings of the 8th International Conference on Personalized Access to Cultural Heritage, Vol. 1352, 19-23.

Schreibman, Siemens, and Unsworth 2004 Schreibman, S.; Siemens, R.; Unsworth, J. (2004). *Companion to Digital Humanities*. Oxford: Blackwell Publishing Professional. ISBN 1405168064.

Speck 2005 Speck, R. (2005). *The AHDS Taxonomy of Computational Methods*.
http://www.ahds.ac.uk/about/projects/documents/pmdb_taxonomy_v1_3_1.pdf

Svensson 2010 Svensson, (2010). "The Landscape of Digital Humanities". In: *Digital Humanities Quarterly*, Vol. 4, No. 1.

TaDiRAH 2016 TaDiRAH: Taxonomy of Digital Research Activities in the Humanities (2016).
http://tadirah.dariah.eu/

Unsworth 2000 Unsworth, J. (2000). "Scholarly Primitives: What Methods Do Humanities Researchers Have in Common, and How Might Our Tools Reflect This?"
http://people.brandeis.edu/~unsworth/Kings.5-00/primitives.html

Warwick 2012 Warwick, C. (2012). "Studying Users in Digital Humanities". In: *Digital Humanities in Practice*. 1-22. ISBN 1856047660

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