How can the specific skills of the librarian in a digital context be used in the future?

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17.1   Introduction: the profession in its societal context

We begin by framing and placing the profession of 'librarian' in its societal context.

17.1.1   Technology and knowledge

The conditions that increasingly influence society, institutions, and working life are persistent, accelerating, and unpredictable (Stegeager and Laursen, 2011, p. 21). The French philosopher Manuel Castells (Castells, 1996) postulated in the 1990s that technology *is* society, and that society can, therefore, not be understood without technology. He reasoned that systems, processes, and institutions, through information technology, are based on network logic (Castells, 1996, p. 5). This development impacts both work structures and human relations because work will primarily be carried out within networks (Castells, 1996, p. 68). When work to a greater degree takes place within networks, it becomes necessary to have a more communication-based culture in institutions and this will affect the institution's social, technological, and structural conditions (Castells, 1996, p. 68).

Gibbons et al. (1995) share this view and describe how knowledge production will change when society develops to become based on the information and communication technology, and how the focus will increasingly shift towards access to knowledge. They predicted that the boundaries between the various societal areas will dissolve, and the division of functions will be replaced by integrated knowledge processes that will interact in completely new ways. In Denmark, this is already familiar in the shape of the attention that is paid to voluntary and committed partnerships with regard to developing new and improved solutions in the educational sector and society in general. This can, for example, be seen in a project under the auspices of the Ministry of Higher Education and Science, in which interdisciplinary and intercontextual development and research networks will be established with the aim of generating knowledge about how to organize courses that aim to develop innovation skills (University College Syddanmark, 2013). At the same time, the boundary between generation and dissemination of knowledge has become more fluid than before: knowledge dissemination takes place within the framework of the actual knowledge generation process. The question is whether these developmental trends necessitate significant changes for academic librarians, if there is a need for new types of relations with the campus, students, and educational programmes, and whether there is a need for new ways of organizing the work in the academic libraries.

Looking forward in time, the general picture of development indicates that it is necessary to acquire increased and improved skills in addition to a mere education, and that the demands for work skills are dynamic, in that they are constantly changing in line with a company's tasks (Holdt Christensen, 2002, p. 21). Psychologist Peter Holdt Christensen emphasizes that work processes change due to, amongst other things, international sharing of work tasks in networks. It will, therefore, not suffice for employees to be high-level specialists only, but they must also develop their specialty in interaction with society's general developmental trends (Holdt Christensen, 2002, p. 21).

Another important impact of major developments on academic libraries is that since the millennium, just about every type of institution, distributor of knowledge, and party that takes over the role of disseminators of knowledge at will, have offered free knowledge resources (Schreiber, 2018). This development is in stark contrast to the past when academic libraries almost had a monopoly on the dissemination of academic literature and existed in a more or less symbiotic relationship with publishers.

17.1.2 Labour market

The development outlined above provides a background to the present, where The Danish Centre for Social Science and Research (VIVE) produced a report in 2018 *Den teknologiske udvikling og kompetencer på fremtidens arbejdsmarked – en litteraturoversigt* (The technological development of skills in the future labour market – a literature review) (Albæk and VIVE, 2018). The publication reviews a range of international reports and studies to identify trends in the demand for skills, and, based on the technological developments, those that will dominate the future labour market. One of the conclusions is that the future labour market does not necessarily preclude current skills from being used in the future, but that they will be prioritized differently. Overall, most studies cite cognitive skills, social skills, and problem-solving skills as the most important (Albæk and VIVE, 2018, p. 6).

The report distinguishes between routine work functions that can be taken over or performed by machines, and nonroutine work functions, and asks whether work functions are cognitive or manual. Routine work functions have been reduced significantly in the recent years, both cognitive and manual. At the same time, there has been a large increase in cognitive nonroutine work functions, whilst the manual nonroutine work functions are placed somewhere in the middle (Albæk and VIVE, 2018, p. 36). The report argues that the movement towards fewer routine work functions and more nonroutine work functions is expected to mean that social skills, collaborative skills, and the ability to interact productively with colleagues will be important in the future labour market. It is presumed that this polarization of skills in the work market will not continue because middle skill job functions, where technical skills combined with basic intermediate skills in reading, arithmetic, adaptability, problem solving, and common sense cannot be translated into components that enable machines or technology to fully take over the work without a significant reduction in quality.

These work functions at the middle level, which are a combination of routine functions and nonroutine functions, are characterized by requiring abilities such as interpersonal interaction, flexibility, and adaptability. In the future, it will thus be important that the labour force has skills that complement new technology; skills that cannot be replaced by technology.

17.1.3 Librarianship in Denmark

The description of middle skill job functions matches to a certain extent what we in Denmark also describe as profession subjects. Profession subjects are characterized by a combination of technical knowledge and interpersonal skills. Profession subjects involve a wide range of skills compared to how they are described, for example, in VIVE's report. They concern specialized/abstract the knowledge on which the profession is based, how 'heavy' the knowledge is, how much authority and autonomy the profession has, and how 'important the tasks are for society at the time'. Therefore, the connotation 'semiprofession' coexists. A semiprofession often suffers the lack of recognition from the ambient society. Overall, the profession librarian is considered either one of the professions or even a semiprofession. In Denmark, as is the case in many countries, library science degrees are at master's level. As with other professions, there has been an academicization of librarianship over the years. Originally, it was a master's apprenticeship, but today it is an academic degree. In this chapter, the focus is on academic and research librarians. What characterizes the job functions in this area of librarianship is teaching and supervision of students carrying out basic education, continuing education, assistant professorships, and PhD studies. This area is also concerned with knowledge gathering, registration of research, dissemination, copyright, preparation of systematic reviews, information technology tasks, and more. Many librarians have also taken a master's degree related to learning processes, knowledge management, coaching, or similar subjects.

17.1.4 Knowledge as emerging, fleeting, and context dependent

An overall picture emerges that is characterized by the fact that knowledge is a crucial product in the global market. Knowledge is emerging, fleeting, and context dependent, and is created in the space between people, society, and technology. Functions that require cognitive skills are on the rise. At the same time, an intermediate group of job functions deals with technical knowledge combined with human judgement, which in all likelihood cannot be outmanoeuvred by technological solutions because its justification lies in the space between the human and the profession.

In any case, the above review bears witness to a close interaction between technology and society that affect each other mutually, and there is much to indicate that technology is strongest. By that we mean that technology has a larger impact on society than the other way around. In this context, we wish to investigate the librarian skills in a digital context today and in the future.

17.2 Research question

How can the specific skills of the librarian in a digital context be used in the future?

17.2.1 Method

This chapter is based on a literature review and two qualitative interviews. The literature review was inspired by the scoping review method (Pedersen, 2017). This was chosen because

we wanted to maintain and highlight the breadth of the question, with regard both to the impact of digital developments on future librarianship, and with regard to the type of studies that are included in the selected literature. The two qualitative semistructured interviews shed light on the views of leading Danish librarians with regard to the question of research. The results from the literature review indicate that there is little Scandinavian literature that sheds light on this particular question. The aim of the two interviews was, therefore, to place the Danish educational sector librarian's (digital) future into a global context.

17.2.2   Scoping review

Our scoping review was carried out according to the following methodology: identification of the research question, preparation of inclusion criteria, literature search, identification of relevant studies, data extraction, and conclusion (Pedersen, 2017).

17.2.2.1   Inclusion criteria

The review includes articles that describe education and research librarians and/or libraries. Even though other types of library (public libraries and school libraries) exist with the same societal environment, we believe that the context from which they originate is not transferable to an educational context. The most important factor that differentiates the two segments of the library sector is that work in a research or education library is not the core product for the institution, whilst work in a public library is the core product in itself. This could mean that the education and research librarian must constantly legitimize herself with regard to the core services: teaching and research.

   We have chosen to include studies with various empirical bases. To maintain breadth in the review, we are interested in studies with various approaches. Our research question can thus reveal trends and predictions, and various approaches can precisely, therefore, be relevant. We only searched for studies and materials published 2016–20. We chose this relatively short timeframe because of accelerating technological and digital developments. In addition, we only selected studies in English from countries and states in which the educational system is constructed in a manner that is comparable to the Danish educational system. We searched the following databases during September-November 2019: Scopus, Library Information Science & Technology Abstracts, Academic Search Premier, Eric, Oria (Norwegian) and SwePub (Swedish), Bibliotek.dk, and Forskningsdatabasen (Danish). The databases were selected on the basis of search results from initial exploratory searches. The databases searched are thus a mix of national library databases, databases concerned primarily with educational research, and interdisciplinary databases. We made this choice to ensure breadth of coverage and to shed light on the research question from a sociological perspective overall rather than solely a library sector perspective.

   The procedure for the search in all the databases was the same. Initially, we carried out a series of broad and transversal pilot searches. Searches were undertaken with natural language and on title/abstract, keyword, author-keyword/author-abstract levels. Wherever possible, the limit functions of the databases were also used. The aim of the initial searches was to identify relevant subject words, core journal titles, and choice of databases. We reviewed the search results and selected a number of articles on the title/abstract level. These articles are the basis of the final search matrix in the individual databases.

Table 17.1 Search matrix for systematic search.

Academic libraries/librarians	Skills	Digital	Future
Academic librarianship Academic librarians Librarian Library roles Library role Librarian attitudes Teacher-librarian-collaboration Library development Academic libraries University library	Competence Knowledge Skills	Technological Technological innovation Technology Artificial intelligence Digital?	Transformation Organizational change Educational change Educational trends New user needs Future of society Time perspective Repurposing

We used the following search matrix in the systematic search (Table 17.1).

The searches were carried out in blocks with the use of Boolean operators. Where possible, we used the database's controlled subject word lists. The search matrix was adjusted and adapted to the various databases. The last search was carried out on 27 November 2019. After sorting on the title level, we had 47 articles that we read through critically at abstract level. Thereafter, we selected six articles based on our inclusion and exclusion criteria and the research question. None of the articles was from Scandinavian databases. The content and conclusions from the selected articles are reviewed in the following section.

17.3   Summary of articles

Since the research question was *How can the specific skills of the librarian in a digital context be used in the future?* We have kept our focus, in the following summary, on the elements that deal with librarian skills in a digital future.

17.3.1   Article 1

Bandyopadhyay, A., Boyd-Byrnes, M.K., 2016. Is the need for mediated reference service in academic libraries fading away in the digital environment? Ref. Serv. Rev. 44(4), 596–626. doi:https://doi.org/10.1108/RSR-02-2016-0012.

In this literature review, no answer is provided as to which skills will be in demand in a digital future; instead, the review indicates the skills that (still) cannot be taken over by digital solutions and that, therefore, are still an important part of librarianship. As the title implies, the focus is on working with references.

The article indicates that the shift from printed matter to electronic resources and the Internet's possibilities for giving access to information has had a great impact on users' search behaviour and thus on working with references. Technological developments

mean that users can access materials on their own wherever and whenever they wish. This paradigm shift, in combination with declining budgets, has forced many libraries to redefine their reference services and it has been shown that there has been a change from librarians being 'information seekers' to being 'information creators'.

The article concludes that no matter how the work is organized, the digital environment will still need human intervention because it is not possible to transfer processes that take place during human communication to electronic solutions. This applies to problem solving and critical thinking as well as the ability to interpret information and user needs in various contexts. These skills can still not be translated into digital solutions.

17.3.2   Article 2

Ciccone, A., Hounslow, L., 2019. Re-envisioning the role of academic librarians for the digital learning environment: the case of UniSA online. J. Univ. Teach. Learn. Pract. 16(1).

The second article focuses exclusively on work in a digital environment and describes three librarians' reflections on being associated with the start of an online educational process at the University of South Australia (UniSA) and the relational, pedagogical, and digital challenges they experienced. The librarians experienced a discrepancy between the role, which they had envisioned and the role that the rest of the participants in the project envisioned for them. For example, the project partners believed that the librarians should check all the materials for copyright clearance and had expectations that they could gain access to e-books for all the students.

The librarians had to assert their value and explain where and when they could be used in the project. They made sure to highlight not only traditional librarian skills but also their abilities in developing students' digital and academic skills.

The three librarians had challenges with the software they used. There were limits in relation to developing what they wanted to develop. In addition, it did not interact optimally with the overall online platform. Digital ingenuity, a good dose of personal robustness, and the close relations they developed were a great help. According to the article, librarians in the 21st century must be good at communication, technology, supervision, teaching, and project leadership.

17.3.3   Article 3

Cox, A.M., Kennan, M.A., Lyon, L., Pinfield, S., Sbaffi, L., 2019. Maturing research data services and the transformation of academic libraries. J. Doc. 75(6), 1432–1462. https://doi.org/10.1108/JD-12-2018-0211.

The article investigates how research data management (RDM) in academic libraries has developed as a consequence of digital developments and, by extension, the influence these developments has had on the roots of the academic library. The background is that other studies clearly indicate how RDM develops and helps transform the role of academic libraries. The study, which is from 2018, was carried out as a web-based questionnaire survey with respondents from employees in academic libraries in many parts of the world: Australia, Canada, Germany, Ireland, the Netherlands, the United Kingdom, and the United States.

The results of the survey indicate that RDM is primarily advisory. Service development is seen mainly as an expansion of traditional librarian supportive tasks in connection with research data. However, a potential transformation can be identified when the traditional service is combined with the demands of new services, such as text and data mining, bibliometrics, and artificial intelligence (AI).

The study seems to confirm the previous studies that indicate that librarians still experience a gap between skills and abilities in relation to delivering qualified work in the area. It also contributes to a broader and promising discussion of how the fundamental approach in academic libraries is fundamentally changing as a consequence of digital developments. In sum, RDM will likely mark a potential paradigm shift in, and re-structuring of, professional relationships by opening up new types of collaboration across professions and faculties, resulting in a new concept of 'co-opetitive', a hybrid between competitive and cooperative. This transformation is also likely to impact traditional skills and professional identity, and create the potential for librarians' involvement in data analysis.

17.3.4   Article 4

Cox, A.M., Pinfield, S., Rutter, S., 2019. The intelligent library: thought leaders' views on the likely impact of artificial intelligence on academic libraries. Libr. Hi Tech 37(3), 418–438. doi:https://doi.org/10.1108/LHT-08-2018-0105.

The article is based on interviews with 33 library directors, library commentators, and experts within the education and publishing sectors. It investigates future expectations of the influence of artificial intelligence (AI) on academic libraries.

The expectation is that AI will optimize search machines significantly, and that text mining and research data management will become a part of librarians' work portfolio. At the same time, new ways of publishing, where traditional publishers no longer provide the only way to publish research and other knowledge, will have an influence on librarians' work and the skills and tools that will become necessary to service users. The librarian will not disappear but there will be changes in the profile. The point of the article is that the modern librarian is a software engineer with skills within procurement and licensing of e-content, software, and services; digital management and digital preservation; design of information discovery infrastructure; with an understanding of the scholarly publishing landscape.

17.3.5   Article 5

Koltay, T., 2019. Accepted and emerging roles of academic libraries in supporting research 2.0. J. Acad. Librariansh. 45(2), 75–80. https://doi.org/10.1016/j.acalib.2019.01.001.

Based on a nonexhaustive review of the recent literature, the article describes theoretical and practical questions, and presents results of the empirical research in the area.

The literature review identifies some of the roles and tasks that academic librarians, as a consequence of development of Research 2.0, must relate to, and which require new and supporting activities and actions. The areas in question are research data

management, expert service, and data curation. The article points at new tasks and roles for data librarians. Some of them are as follows: continuous storage of data, distribution of unique identifiers, creation and management of metadata, data curation, and development of an infrastructure that supports data management throughout the research process.

Academic librarians must adapt to new conditions and new requirements in research environments. Today, librarians can, on the one hand, make use of their traditional skills when managing data. On the other hand, they need to bring a conceptual understanding of data into the process and must be able to find, extract, gather, filter, organize, analyse, and present data. Some librarians acknowledge that the library is not seen to offer RDM support because involvement in research data management happens too late. It is, therefore, important to create personal relations between researchers and librarians.

17.3.6   Article 6

Poremski, M.D., 2017. Evaluating the landscape of digital humanities librarianship. Coll. Undergrad. Libr. 24(2–4), 140–154. doi:https://doi.org/10.1080/10691316.2017.1325721.

Digital humanities (DH) is not an independent area of knowledge, but a number of different practices that explore a world where printed material is no longer the exclusive or normative medium. The American Association of Research Libraries describes DH as a growing field that uses computer-based technologies to explore new areas of research in humanities. Librarians working in this field face the special challenge of finding the best ways to support this rapidly developing discipline. How do we satisfy the users' new demands? How do we adapt librarianship to this growing field of study?

The study indicates that for academic, specialized librarians, DH can potentially lead to new partnerships. DH offers new, emerging, and intellectual space and methods for using new technologies and tools. The challenge for specialized librarians is to identify and meet the needs of this new intellectual discipline. The particular challenges in the digital environment call for expertise with regard to the creation and navigation of sustainable digital solutions.

The results of the study coincide with a bigger picture: that libraries are experiencing an identity crisis and that there is a need to find out which disciplines are important in the academic environments. A DH librarian builds bridges between the current humanities research methods. Academics in the Humanities need to collaborate with librarians with regard to new methods and technological solutions on campus.

17.4   Interviews

We carried out two qualitative interviews. The interviewees were selected on the basis of their roles as leaders with many years of experience in the sector. They were also selected because they work at the strategic level, setting the direction for future work

in research and educational libraries. The two respondents each represent their professional college. For the sake of anonymization, we will refer to the interviewees as interviewee A and interviewee B.

The focus of both semistructured interviews was to elicit answers to the question of how leaders view the future role of specialized librarians and which specific skills they feel these people either have or will need to have to ensure the continuing development of research and educational libraries in their respective contexts. Prior to both interviews, the interviewees received a guide because, as questions had a certain complexity, we felt that the quality of the answers to our questions would have improved significantly if the subjects were given an opportunity to reflect on the themes.

The questions were as follows:

1. Do you agree with the statements that, over the last 15 years, there has been a tremendous digital development and that it has had a great impact on the educational libraries?
2. What in digital development do you think has been the most crucial element for the libraries? And in which way?
3. How do you see the role of the educational library today in a world characterized by digital services and digitization at all?
4. What do you think educational librarians' core competencies are—what are we doing that others cannot?
5. Do you see any new tasks that the education library could benefit from?
6. How do these tasks differ from library tasks in the past? Why do we have to take these tasks?
7. In what areas do you think that we, as an educational library, are particularly challenged by the digital development when it comes to competencies?
8. Do educational librarians have some special strengths in relation to digital development and the competencies it demands?
9. What is unique about us? Do we have any competencies that cannot be acquired by other professional groups or put in an electronic formula or algorithm? If so, which ones?
10. When you work with library development on a strategic level, where do you look for inspiration?
11. How do you select which trends the education library should follow?

The interviews were processed on the basis of the qualitative research method with transcription, meaning condensation, and theme derivation (Kvale and Brinkmann, 2015).

17.4.1 Analysis of data

The interviews were performed and recorded via Skype business (audio file attached in the addenda) and were then transcribed in fragments. The analysis was performed according to Kvale's five steps (Kvale and Brinkmann, 2015) where, first, (1) an overall impression is made, (2) units of opinion are identified, (3) then thematized, (4) the units of opinion are questioned, and (5) the themes are connected in a descriptive statement (Kvale and Brinkmann, 2015, pp. 269–270).

The analysis is thus made in relation to a hermeneutical circle structure as mentioned above, where the intention is to initiate the process which through

preunderstanding leads to understanding and postunderstanding (Thisted, 2014, p. 62). Postunderstanding will thereby appear as new interpretations that can enlighten the thesis, as will become evident in the conclusion.

17.4.2   Interview themes

17.4.2.1   The asynchronous meeting

Both respondents agree that the technological changes are more than 15 years old. The most significant transformation caused by these is that the librarian must be able to relate to the asynchronous meeting with the students and other users and the fact that we no longer hold the sole access to information.

17.4.2.2   Relational and collaborative skills

There has been a migration away from the physical space towards a collaboration with the educations. And, the respondents put great emphasis on the relational skills and the interdisciplinary collaboration, where the educational librarian needs to apply his/her skill set in different contexts and milieus.

17.4.2.3   Critical thinking and digital formation

One respondent emphasizes the role of the educational librarian regarding digital formation in that there is a great task in teaching the students to be critically reflective, particularly because, when moving around digitally, we leave behind data which is then picked up by tech giants and used for commercial purposes. The tech giants already know far too much about us. In the digital formation lies also the understanding of how these data can be used against us. Here, we see an ethical and democratic dilemma in which the educational librarian also plays an essential role.

17.4.2.4   The unique skills of the educational librarian

Both respondents agree that the educational librarian has a special task related to knowledge production and dissemination. They can qualify the research process because they can aid in qualifying the research question and in finding the pre-existing information. Moreover, when it comes to the handling of information in general, we can provide tools to all types of users, which can support the processes of finding and assessing. Within this area lies the unique skills of the educational librarian.

17.4.2.5   From generalist to specialist

Technological development entails some of the traditional work areas in which the educational librarian has been taken over by technologies. They nevertheless still need to support their use. The field has grown too vast for one to have a general overview. The educational librarian must, therefore, dare to specialize within specific areas of

knowledge such as, for instance, some of the aforementioned. They need to possess the more general skills within the pedagogical and didactic area, as these particular fields of knowledge define the very existence of the trade.

17.5   Results

Overall, as described above, the literature indicates that various societal conditions will contribute to disruption of the concept of libraries in the educational sector. In the light of technological developments, the skills that will be in demand in the future library job market will include cognitive, social and problem-solving skills, and increasing numbers of librarians will have their skills challenged and must work on them (Ciccone and Hounslow, 2019). Some studies emphasize digital literacy and data literacy as key concepts behind the digitization of library work and education in general (Ciccone and Hounslow, 2019). This concerns the content of what we need to know and be capable of with regard to new media and digital tools, and how we interact with them and each other in a digitized world. Studies as well as interviews point out the following themes for the skills of the specialized librarian in the future.

17.5.1   New ways of retrieval, preservation, and dissemination

Overall, the studies and interviews show broad consensus that the transition from physical materials to electronic materials is the most important change in the work conditions and tasks of the librarian because he or she no longer has control of the indexation and search processes. This means that she can no longer predict and explain a search result with the same precision. A loss of control has occurred here. The changes have a great impact on what previously could be described as the core of the traditional work of specialized librarians (Bandyopadhyay and Boyd-Byrnes, 2016; Ciccone and Hounslow, 2019; Cox et al., 2019a,b).

Since the advent of the Internet and search machines such as Google, much knowledge can be accessed online. Users have altered their search behaviour and no longer need to go to a physical space for help (Bandyopadhyay and Boyd-Byrnes, 2016). In addition, more and more academic programmes can be taken online. The librarian must, therefore, liberate herself from the physical space and seek users and partners in various places and contexts. She must work across disciplines and relate to an asynchronous reality (Bandyopadhyay and Boyd-Byrnes, 2016; Cox et al., 2019a,b).

17.6   Librarian skills in a digital society

When we look across the literature and the two interviews, there is a sizeable convergence of the skills that are regarded as being important for the future librarian. They fall within a range of themes that we have chosen to mention highlighted here:

- Technological and digital skills.
- Skills within the research area, including knowledge generation and knowledge processes.
- Skills within digital humanities.
- The last theme, interpersonal skills, is clearly dominant.

The four themes are described as follows:

17.6.1   Technological and digital skills

A wide-ranging set of skills predominates here. First and foremost is data management in a broad sense. It is described as, amongst other things, data curation and the management of big data. Common to both is that they concern the ability to procure large amounts of data from various sources, to analyse them, and then put them to good use in a given context. Data curation is more in line with classic librarianship skills because there is an emphasis on organization, quality assurance, and dissemination of data, whilst big data, which stems from computer science, has a more commercial aim (Cox et al., 2019a; Koltay, 2019).

Another important topic within this theme is research data management: the digital processes in the research process (Cox et al., 2019a; Koltay, 2019). Other skills that emerge from both textual informant empiricism are familiar librarian skills, but that are believed to gain greater importance, such as bibliometrics, information architecture, and text mining. Roles such as web developer and programme supporter are also mentioned. There is also a new concept, co-opetitive, as described previously, which describes the librarian as a hybrid between a collaborator and a competitor (Cox et al., 2019a).

Development within AI is also mentioned as an element that will affect librarianship in the future; the question is how. One study indicates that the modern librarian is a software engineer with skills in, amongst others, procurement and licensing of e-content, software, and services; digital management and digital preservation; and design of information discovery infrastructure (Cox et al., 2019b). A final topic includes a number of transversal skills within digital humanity and digital literacy (Poremski, 2017).

17.6.2   Skills within the area of research

There are many indications that in the future librarians will become close collaborators with researchers in several ways as perhaps an 'extended research assistant'. Librarians need to have knowledge about or at least insight into all disciplinary landscapes and their standards for research, their norms, and their ethics. Librarians must be able to facilitate research processes and ensure access to the gathering and dissemination of the knowledge that the research generates (Cox et al., 2019a,b; Koltay, 2019). One article mentions the 'hybrid researcher' (Poremski, 2017).

17.6.3   Skills within digital humanities

This theme includes skills that are already required for most librarians in educational institutions (at least in Denmark). They include didactics, classroom teaching, critical reflection, source criticism, academic skills, and the ability to produce syntheses.

Topics such as entrepreneurship, innovation, and project management are mentioned repeatedly. These three topics have all been important in Danish educational policy for years as skills that are necessary for our survival. There will, therefore, be a number of librarians employed at research and educational libraries, who have worked with these skills in various ways in the past 10 years or more (Regeringen, 2006).

17.6.4   Interpersonal skills

This theme is clearly the biggest one. 'Relational', in particular, is a term that appears regularly (Bandyopadhyay and Boyd-Byrnes, 2016; Cox et al., 2019a,b; Koltay, 2019; Poremski, 2017) (interviewee A and interviewee B, 2020). In addition, terms such as communication, interpretation of needs, broker, interpreter, host, partner, collaboration, dissemination, and intermediary are used. Common to these terms is that they touch on the inter and intrapersonal, and that they are precisely the skills that cannot (yet) be translated into technological and digital solutions (Bandyopadhyay and Boyd-Byrnes, 2016; Poremski, 2017; Koltay, 2019). It is about using personal abilities and skills to understand people in various processes and contexts. This means that the librarian must constantly be able to relate to something dynamically emerging and analyse how her own skills can be brought into play in the context in question (Poremski, 2017; Koltay, 2019).

17.7   The overall picture

Rapid digital development has major implications for *what* we need to learn and *how* we need to learn. The need for new forms of interaction and collaboration, including how the librarian should enter into new knowledge generation and knowledge processes in completely new contexts are pointed out (Ciccone and Hounslow, 2019; Koltay, 2019; Poremski, 2017).

The librarian must be capable of being in what Mezirow calls a transformative learning process. According to Mezirow, learning is 'creating new or revised interpretations of the meaning of an experience that contributes to shaping subsequent understanding, assessment, and action' (Illeris, 2012, p. 157). This means that learning can have various depths or levels in the individual. Mankind seeks meaning and is reflective and must, therefore, be understood as an interpretive being. Man must be understood via what takes place on the intrapersonal level. Man seeks meaning, which is structured by setting up frames of reference and perspectives. These are created through the socialization process, where emotion exerts a strong influence on how deeply the meaning perspective is stored in mankind. Knowledge generation is perceived as a construct: the individual constructs a meaning with his or her experiences based on assumptions and experiences, and when this basis of understanding no longer gives meaning, a new understanding of meaning is constructed.

Mezirow's conceptualization of learning operates at different learning levels. Here, we would like to highlight (i) instrumental learning, a cause-effect relationship, where there is a focus on the actual action and (ii) communicative learning, where the idea is

to understand meaning and create coherent understanding (Illeris, 2012, pp. 162–163). Critical reflection happens when we experience problems or dilemmas, where our current 'frames of reference' no longer give meaning. We are forced to change perspective. Changes in perspective are a critical reflection of how and why previous meaning perspectives helped us to experience and understand the world around us and how this perspective is no longer viable. Critical reflection on one's own terms can thus lead to transformative learning.

What the librarian need is to be capable of ongoing critical reflection on her way of mind and 'frames of reference'. It represents a state of constant willingness to change mindset and views to what is important in any given environment/context at any time.

17.8   Discussion

As mentioned above, a common feature of both the studies and the interviews is the assumption that technological development increases the need for new ways of working and new skills. These developments give rise to new trends, where society's focus shifts from products to processes. A characteristic of these processes is that we are constantly on the move, and that we as employees must constantly be able to regulate the course of, and review, the processes since new elements must be taken into account. According to the articles and the interviews, these changes exert considerable influence on what is considered the core of the academic library, which has traditionally been the procurement, creation, and dissemination of knowledge and is now about facilitating knowledge generation. The change indicates a significant need for developing the academic library of the future, where there are demands for new and even more complex and diverse skills.

The pervasive and most central skills are, according to the studies we reviewed and the statements from the interviewees, the interpersonal skills that focus on individual interaction, and their importance and role in relation to learning and learning processes. The focus could be on dialogue, practices, or ways of interacting (Säljö, 2003). There are strong indications that academic librarians and libraries worldwide face a common challenge. We believe that two central issues can be identified:

(1) Academic libraries need to be more visible and present in educational institutions—at different levels. The prerequisite for this is development of a new library image, where the library is perceived as a dynamic function that is deeply involved in many different processes in the educational environment. It can be postulated that the role is, therefore, no longer to view oneself as an institution within an institution, but rather as a process. This perspective is also fundamentally linked to the fact that knowledge is built up and changed in the processes. This means that:

(2) The academic librarian must go out to where things are happening, and establish new relations, as traditional roles are dissolved. We believe that it can be destructive if the librarian seeks to cling to old roles and tasks. The question is how academic libraries can liberate the future so they do not just end up being copies of the present. This is supported by the empiricism presented in this chapter, which emphasizes that academic librarians must balance working with new tasks in new relationships and new ways of collaborating, with the existing tasks—within organizational or structural conditions, which will not necessarily change.

In addition, it is not necessarily a process without conflict for the individual academic librarian, since learning is about questioning the validity of a meaning perspective—a meaning perspective that has perhaps always been taken for granted and that is based on an academic understanding of oneself and which may mean rejecting values that have been central to one's professional self-perception (Illeris, 2012, p. 165). As we have mentioned previously, Mezirow describes this process as transformative learning:

> *Transformative learning refers to the process by which we transform our taken-for-granted frames of reference (meaning perspective, habits of mind, mind-sets) to make them more inclusive discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action.*
>
> *(Illeris, 2012, p. 68)*

According to the Danish learning theorist Knud Illeris, transformative learning is also central to the concept of skills because it is about what the things learned can be used for in relevant contexts. In Denmark, the new generation of librarians has also received another education, because the educational programme has been reformed continuously and has been closed as an independent institution. Our Danish management interviewees, therefore, ask themselves if what they regard as the essence of academic librarians is simply on the way out. In line with this, they point out that there is an identity crisis.

17.9   Conclusion

In answer to our research question: *How can the specific skills of the librarian in a digital context be used in the future?* Digital development and video production have radically changed work in academic libraries. In future, academic librarians must take on roles that require cognitive, interpersonal, and pedagogical/teaching skills. The librarian must work closely and in an integrated manner with a wide range of partnerships, including with researchers and teachers, and be skilled at creating close work relationships with a range of collaborative partners. The librarian must be able to keep pace with a dynamic and emerging reality, where new tasks and skills must be introduced. We are talking about skills and tasks within areas such as RDM, artificial intelligence, and creation of digitally sustainable solutions.

In addition, the librarian must have solid insight into the knowledge, ethics, and research methods of each domain. These are skills that to a great extent build on the librarian's core skills. In future, the librarian cannot survive by being a specialist within her specific domain but must instead constantly enter into new processes and partnerships with the other actors in the institution. As such, the library goes from being a function to a process that is constantly part of a number of other processes.

17.10   Outlook

According to Trine Schreiber, the profession is not predetermined but is something that is created and developed by participating in various networks within and outside of the institutional framework. The actors are students, teachers, researchers, programmes, and digital technologies. The individual librarian is formed by networks and tasks (Schreiber, 2015).

The processes and the various networks will reflect the realities that will affect and shape each librarian's understanding of her own reality. Seen in that light, there are strong indications that the concept of skills in an educational environment will be in constant movement, and that it may develop variously at different educational institutions. We will leave that question open.

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