



Digital and socio-demographic aspects of the dissemination of library and information science education

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Abstract. The processes of digitisation in society have an impact on the technological, socio-economic, and demographic aspects of developing and implementing educational programs in the library and information sector. This results in an increased role for libraries, archives, and management structures as educational centers. The article aims to study the patterns of influence that the digitisation of society has on the technological, socio-economic, and demographic aspects of developing and implementing educational programs in library and information science at foreign educational institutions. Research methods are analysis, synthesis, logical generalisations, synchronous section, and content analysis. The findings reveal that the inclusion of educational components on digitalisation and information literacy in bachelor's and master's programs, as well as in postgraduate education programs for continuous professional development of specialists, contributes to improving education quality and adherence to educational standards in library and information science. The competitiveness of educational programs is determined by their alignment with labour market needs. The social desirability and status of the library and information science field are contingent upon shifting away from conventional notions regarding its societal function. The institutional functions of academic libraries are evolving as they engage in scientific research as research partners and provide scientific communication services. Innovative pedagogy in library and information science entails adherence to the values of social equity, diversity and inclusivity, and accessible education and research. Libraries are acquiring a dominant status as information and analytical centers. Digital technologies profoundly change the nature of the professional activities of library and archive workers. These trends drive the transformation of higher education towards international educational standards and modernisation of professional education content. The practical significance of the study is that its results can be used to improve and revise educational programs in library and information activities

Keywords: educational program; scientific information; technical information; program competencies; program learning outcomes; quality of education

Introduction

Digital technologies have a significant impact on social development, affecting electronic communication and access to various services such as education, health-care, and banking. In addition, they are transform-

ing traditional information structures into research and education centers with global access to resources and scientific achievements. The growing demand for comprehensive information is expanding the

Suggested Citation:

Komova, M., & Drapaliuk, D. (2024). Digital and socio-demographic aspects of the dissemination of library and information science education. *Library Science. Record Studies. Informology*, 20(2), 50-59. doi: 10.63009/lrsi/2.2024.50.

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document flow and increasing the flow of various types of information. As a result, information infrastructure, including research institutions, reference services, and electronic document management, is also expanding to protect electronic documents. These factors determine the development of library and information education systems, with curricula adapted to the socio-economic and technological status of the state.

The expansion of information services and educational programs in foreign institutions is driven by the need for digitalisation, addressing socio-demographic issues, a developed social base for education, and meeting the demand for digitally competent young professionals in the labour market.

N. Khymytsia (2023) emphasises that integration into the global market for the provision of educational services and the labour market requires the study, adaptation and implementation of the positive experience of US universities in educational standards and training programs for specialists in higher education institutions of Ukraine. High educational standards of developed countries are benchmarks for developing countries. A.V. Humenchuk (2022) considers the modern vectors of development of higher library and information education in Latin America and Africa as those aimed at forming a graduated model of library and information education, modernisation and gradual transition to qualitatively new educational standards. M. Adamenko (2022) determines that digitisation is inextricably linked to the phenomenon of open knowledge, influences state and institutional policies in the field of higher education and forms the technological basis for derivative scientific concepts such as open access to information, open education and open science. The digital representation of data has revolutionised research practices, altering how research is conducted, stored, published, and disseminated. K. Markevych (2021) details the solution of socio-economic, political, cultural, educational, technological, and socio-demographic challenges associated with digitalisation at international and national levels involves encouraging the development of digital interaction between countries and establishing global standards that take into account economic, political and cultural differences, reducing digital inequalities between developed and developing countries and building digital technologies accessible to the entire population.

The digitisation, socio-demographic, and pedagogical aspects of expanding library and information science education are contextualised within the United Nations' Sustainable Development Goals (2015-2030) (17 Sustainable Development Goals, 2023). I. Koreneva (2018) explores the concept of sustainable development as inextricably linked to education, in particular, "education for sustainable development". I. Sichko (2015) considers this issue in terms of its essence and features, as well as European integration processes in modern

education. O. Voskoboinikova-Huzieva (2020) argues that the new educational paradigm should promote the formation of a mindset that views all socio-economic and socio-environmental processes through the prism of sustainability and science-based precaution. O. Vysotska (2015) emphasises that the implementation of the Sustainable Development Goals aims to equip people with knowledge and skills for successful life in the new social and information environment, to enable them to actively contribute to the preservation and harmonious development of human society.

The article aims to study the regularities of the influence of processes of digitisation of society on the technological, socio-economic, demographic aspects of the opening and implementation of educational programs on library and information activities in foreign educational institutions.

In order to realise this goal, it is necessary to perform the following tasks: to identify trends in the use of educational programs in library and information sciences; to provide educational components related to digitisation in the humanities necessary for the training of librarians, taking into account foreign experience; to ensure that LIS educational programs meet the needs of the labour market and to promote the development of digital competencies of library professionals through continuing professional education.

The scientific novelty of the article lies in establishing the thematic focus of scientific research and identifying the specifics of training programs for specialists in library and information sciences at foreign universities.

The research methodology includes general scientific methods: analysis, synthesis, logical generalisations, synchronous section, content analysis. A synchronous section of publications indexed in the Scopus database from 2020 to 2023 was conducted. The content analysis of scientific articles made it possible to highlight the educational activities of universities on different continents and to identify the specifics of the content of library and information science curricula at universities.

Trends in the use of educational programs in library and information sciences

In the digital age, information has become a key asset and a powerful force in society. With the growth of large amounts of data, it is important for library and information science professionals to have skills in library management systems, understanding user behaviour, and performing analytical tasks such as data mining, text mining, knowledge classification, and information auditing. Progress in the field depends on the ability to conduct in-depth data and text analysis and mastery of information management technology. Skills and practical experience of LIS (Library and Information Science) specialists are not limited to information literacy. Proficient analytics specialists can utilise library user data to improve management and training systems.

An essential qualification for professional library positions in the USA is a Master of Library and Information Science degree (MLIS). A library school is a higher education institution that provides professional training for library workers. The first one was founded by Melville Dewey, the creator of the decimal system, in 1887 at Columbia University in the United States (Eberhart, 2016). Since the 1960s, there has been a shift towards electronic resources for information access with the development of telecommunications and computer networks. This transition from print to electronic media, and to information functioning beyond traditional library boundaries, has led to a reevaluation of the traditional definition of library activities and a tendency to broaden the scope of library education to include information and computer sciences. The iSchool is designed to advance the field of information in general (Olson & Grudin, 2009). There is an extensive network of library schools in the USA. Admission to an MLIS program at library schools typically requires a bachelor's degree in specific area. Most library schools in the US and Canada offer programs exclusively for university graduates who already hold other majors. Accreditation of these programs for an MLIS or MLS degree is provided by the American Library Association (ALA). This organisation provide accreditation of 65 programs at 60 institutions in USA and other countries (Accreditation Frequently Asked Questions, 2024). The bachelor's degree in LIS was largely phased out several decades ago (Wilson, 1966; White, 1976). The MLIS program at the University of California, Los Angeles (UCLA) gives understudies with a mix of conceptual, theoretical information, and viable encounter. Students learn modern library, archival, and information technology. UCLA's MLIS program, accredited by the ALA, is recognised as one of the most inventive and comprehensive in USA (Master of Library and Information Science, 2024). The University of Washington offers a master's program in library science (UW iSchool) in both educational and online modes (Master of Library and Information Science, 2024).

MLIS/MLS degree programs can vary significantly. The primary educational components typically include the study of information organisation methods, the concepts and ethics of information dissemination, as well as the creation and management of physical and digital resources. The educational component of instructive programs includes obtaining innovative abilities in different disciplines: information analytics and information administration; organisation store administration; digital libraries and digital preservation; data frameworks and data engineering; network equipment and program for computer network administration; integrated library systems; programming languages; web design, metadata and semantic web innovations; automation and natural language processing. Research methodology courses are offered for those pursuing

a Doctor of Philosophy degree, while management courses are available for those aspiring to managerial positions in libraries.

A.R. Davis *et al.* (2023) pointed that comparative studies of library science educational programs highlight national traditions and educational peculiarities more clearly. Educational requirements for LIS programs in Croatia and the USA complement studies in comparative education and comparative library science. The educational path in LIS in Croatia is more structured, leading from a bachelor's degree to a master's degree and potentially a postgraduate license. Croatian programs emphasise technology and collection management more prominently. In contrast, US universities typically offer only MLIS/MLS master's programs, which include more management courses and offer greater flexibility in course selection. Both countries' programs tend to be flexible and easily adaptable. The curricula in both countries cover several fundamental courses in librarianship.

Digitisation of humanities in librarian training content

Digital Humanities (DH) is an interdisciplinary academic field that has become integral to library practice. However, the level of student preparation for such work in modern Library and Information Studies (LIS) programs remains a topic of debate. An analysis of ALA-accredited LIS degree programs reveals significant variation in the number and scope of DH courses offered across Canadian universities. While information and computer courses necessary for digitising library work are widely taught, project management training remains deficient in most programs (Isuster & Langille, 2023).

S. Das *et al.* (2023) indicated that Digital Humanities has gained considerable popularity among students, educators, and professionals in library and information science due to new employment opportunities in libraries, museums, archives, cultural heritage organisations, and scientific data. DH employs computational methods to address humanities and social sciences issues such as history, philosophy, literature, and language. DH introduces unique approaches to traditional inquiries. However, DH is still in its early stages in the educational activities of Indian universities. Research projects are being developed for LIS schools in the context of integrating DH courses into curricula, offering a comprehensive view of DH development trends in the LIS field in India.

The training of specialists in librarianship and information sciences has declined, evident from the discontinuation of professional educational programs at several universities in Spain. To avoid obsolescence in a rapidly evolving information landscape, this profession must explore new avenues of application. The roles of Intelligence Manager and Intelligence Analyst could potentially offer new fields of study and

professional careers. Spanish universities are adapting their educational programs in library and information sciences to cultivate competencies necessary for careers in “Intelligence Professional” and “Intelligence Analyst”. These new professional profiles include a comprehensive array of subjects (Muñoz-Cañavate & Díaz-Delgado, 2021).

Developing literacy in information and communication technologies is essential for effective research data management and digital curation. Based on data from institutional websites of master’s programs in LIS accredited by the ALA, the requisite technical and technological skills for librarians have been identified: knowledge of metadata standards, familiarity with data resources, proficiency in programming languages, and other interdisciplinary skills. Library practices increasingly rely on information and communication technologies for research data management (Costal *et al.*, 2020).

M. Cerny (2021) noted that, a self-assessment of digital competencies among students of LIS at Masaryk University in the Czech Republic reveals strengths in information literacy, data management, and communication and collaboration skills. However, students are inadequately prepared in individual competencies to serve as highly skilled information specialists. There is a notable deficit in programming competencies and technical skills. The information and library studies educational program requires innovation to meet the demands of digitally competent information professionals.

The alignment of LIS educational programs with labour market needs

Studies assessing the compatibility of educational programs with LIS to prepare students for youth service roles in public libraries have been relevant. A project funded by IMLS examined students’ readiness for working with young people in public libraries. Surveys, virtual meetings, and discussions with practitioner focus groups, library administrators, and LIS educators revealed evolving trends in youth services within public libraries and identified gaps in current educational programs for youth librarianship. Researchers point out to significant shifts in youth service roles, highlighting discrepancies between traditional LIS curricula and the essential knowledge and skills for success in this domain (Rawson *et al.*, 2023).

An assessment of the relevance of LIS educational programs to the modern labour market in Pakistani universities, based on surveys of faculty, specialists, students, and employers in the information sector, reveals that current curricula do not meet market requirements. Issues include inadequate educational resources, inconsistent content in information and computer technology disciplines, irrelevant subjects, and insufficient practical training for LIS students. These findings underscore the urgent need for academic and

governmental attention to the mismatch between LIS training programs and market needs, as well as students’ perceptions of educational quality in information studies (Ismail & Khan, 2021).

The scientist P.T. Sibiya (2024) mentioned that The Fourth Industrial Revolution (4IR) and the advancement of digital sciences have fundamentally transformed the field of LIS, necessitating the inclusion of digital scientific content in educational programs at LIS schools in South Africa. However, there persists a gap between the demands of the labour market and the educational offerings of LIS programs. A survey involving scholars from LIS schools, academic librarians, and specialists from research institutions confirmed that LIS curricula often lack essential digital science components such as research data management (RDM), digitisation, metadata standards, open access principles, and institutional repositories. Collaboration among librarians, IT specialists, LIS researchers, humanities scholars, the South Africa Qualifications Authority (SAQA), and the Department of Higher Education and Training (DHET) is crucial to bridging this gap and ensuring graduates possess the necessary skills and competencies.

An in-depth examination of LIS professionals’ training in digital sciences helps gauge the knowledge, skills, and competencies of graduates from the School of Library and Information Science. South African academic and specialised research institution libraries have initiated various initiatives in digital sciences, including digital scholarship. However, many librarians trained in LIS schools before digital scholarship. Those pursuing digital LIS fellowships must acquire knowledge and skills related to digital technologies with the help of short courses for enhancing competencies, while institutions should allocate resources for infrastructure and training (Sibiya, 2023).

In Jordanian academic libraries, librarians’ high levels of digital skills significantly enhance their utilisation and perception of technological innovations. These digital skills are actively applied in managing electronic library infrastructures and services. Gender, age, practical experience, library type did not notably affect these results, although funding for librarian training remains a substantial barrier to acquiring digital skills (Hamad *et al.*, 2021).

M. Aslam (2022) noted that, the global transformation of the role of academic libraries and library professionals is driven by technological advancements, the proliferation of digital resources, and the provision of innovative services. Professional publications retrieved from the EBSCO and ProQuest databases underscore that the most effective approach for librarians to acquire new competencies and adopt innovative systems involves rethinking traditional workflows and fostering collaboration across all levels. Academic libraries continue to play a pivotal role in society by providing essential services and information resources.

Digital competences of librarians in the implementation of continuing professional education

A crucial aspect of research involves qualitatively assessing the theoretical knowledge and practical skills of librarians in Canadian academic libraries regarding data processing, analytics, and management. Specifically, MLIS is examined for its effectiveness in providing adequate training and practical experience for librarians engaged in activities such as data management, data transfer services, and working with systems for creating, managing, visualising, and analysing various data types within academic institutions. Four primary skill groups in data processing for librarians are identified: conducting original research, understanding information coding technologies and quantitative methods, proficiency in metadata comprehension, and adaptability in rapidly acquiring new skills on the job. However, researchers indicate that while expertise in metadata, documentation, and information management remains crucial, MLIS programs are becoming less competitive compared to those offering hands-on experience with diverse data types and methodological approaches in a research context (Rod, 2023).

The author M. Borbély (2022) stated that in Hungary, the assessment of digital competencies among librarians of public libraries was conducted under the grant "Development of Museums and Libraries for All" by the Szabó Ervin Library in Budapest. A comprehensive study examined the impact of varying educational levels on digital literacy competencies among city librarians. Results highlighted that higher educational qualifications strongly influence digital competency across all literacy domains. The survey identified current digital skill levels among city librarians, identified areas for improvement, and underscored the necessity for targeted professional training.

In Croatia, at the "Ivan Goran Kovačić" City Library in Karlovac, the evaluation of actual digital competencies among professionals sheds light on their awareness and adaptation to modern digital technology demands for enhancing library services. Librarians self-assess their digital competencies based on experience in meeting user demands through information searching, selection, and storage. Most librarians independently enhance their digital skills outside formal professional development systems (Katić, 2022).

The authors F. Abbas *et al.* (2023) pointed that continuing professional development (CPD) remains pivotal for librarians to uphold competencies aligned with emerging trends. A study on CPD publication activities, utilising resources such as Scopus, Web of Science, Google Scholar, and LISTA, identified Skype,

Zoom, Google Meet, and YouTube as principal digital video conferencing platforms widely utilised by professionals for remote CPD. Leveraging these channels holds significant potential for enhancing the technological proficiency of librarians.

There has been a noticeable shift in the institutional mission of academic libraries in Nigeria, with academic librarians increasingly engaging as research partners in scientific endeavors. This evolving role and competence of academic librarians in research partnerships represent a significant development in academic librarianship. Academic librarians now provide scientific communication services, fostering scientific cooperation within universities. This collaboration encompasses various facets: information identification and provision, information utilisation and evaluation, grant applications, formulation of research topics, literature and reference management, research data management, analytical literature reviews, manuscript creation, scientific publication, and research dissemination. Successful participation in research partnerships requires knowledge of research methodology and research data management. Essential skills include digital literacy, the ability to conduct information and analytical literature reviews, citation management, data curation and preservation, bibliometrics and information evaluation, and effective communication. Attitudinal indicators such as professionalism, patience, and empathy are also critical. To enhance their capabilities in research partnerships, academic librarians should engage in educational programs, seminars, and conferences focused on research methodologies. These activities are essential for acquiring necessary competencies and improving service delivery efficiency in research collaborations (Rabasa & Abrizah, 2022).

In turn, the organisation of distance learning has emerged as a primary direction in the digitalisation of professional training. Since 2007, the European Union has funded research aimed at identifying optimal models for distance education in information, library, and archive management. Many universities across Europe, following the British model, have integrated library, information, and archival specialties. The UK boasts advanced digitisation and information infrastructure, with formalised educational programs meeting national standards.

France and Spain also emphasise distance learning in these specialties, reflecting a broader European trend toward digital competence in information, archival, and library affairs. Educational initiatives focus on equipping teachers and students with digital competencies applicable to the educational landscape (Bachynska *et al.*, 2023). This should include training in information management, the use of electronic

resources, the integration of digital technologies into the learning process, and the development of innovative teaching methods that contribute to improving the quality of education and training professionals who are able to adapt to a rapidly changing digital environment.

Humanistic aspects of LIS education

As part of the “Development of Museums and Libraries for All” project, a nationally representative study in Hungary explored the correlation between the level of digital literacy and the gender and age of librarians in public libraries. The research, based on DigComp 2.1,

assessed librarians’ self-perceived competencies across five areas (Fig. 1). Librarians generally demonstrated a high level of information and information literacy, but faced challenges in content development. There was a marked gender disparity: more women had basic digital skills, while men were more likely to have highly specialised digital skills. Age had a minimal impact on information and digital literacy skills, but correlated with competencies requiring greater technological awareness. Younger librarians demonstrated higher communication and problem-solving skills than their older colleagues (Borbély & Némethi-Takács, 2023).

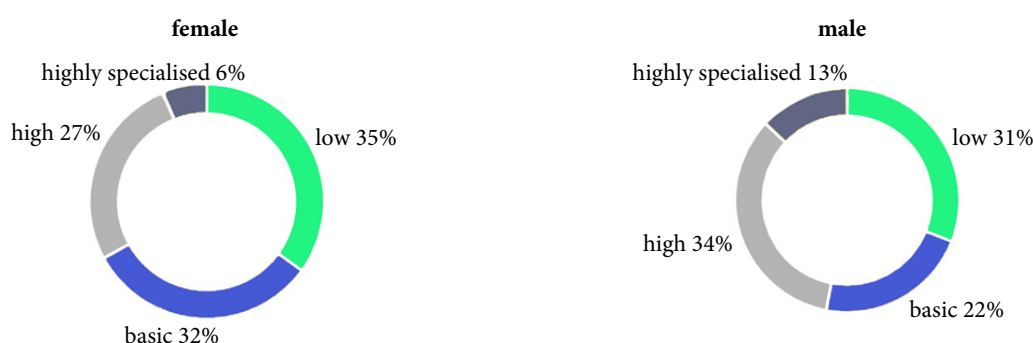


Figure 1. Results of self-assessment of librarians’ digital competencies

Source: developed by the authors

The scientists D.E. Park & S.K. Ramos (2024) said that in academic libraries, diversity support programs aim to address systemic barriers and support students from marginalised communities. Collaborations between research librarians and undergraduate research supervisors are crucial in fostering social equity and communication to overcome barriers faced by students pursuing higher education. Also, the authores noted that at Federal Fluminense University (UFF), Brazil, undergraduate programs in “Archival Science” and “Library Science and Documentation” integrate disciplines such as Reference and Information Services and Cultural Action in Information Units. These courses aim to educate archivists and librarians as information and cultural mediators, emphasising the societal relevance of their roles. By leveraging information technologies of the cybercultural society – facilitating information exchange, interactivity, collaboration, and digital tools – students actively engage in the educational process, contributing to their humanistic and social education.

Social and pedagogical goals are realised through the array of disciplines offered in the undergraduate educational programs of “Archival Science” and “Library Science and Documentation” within the courses of library science, document science, and archival science at the Federal Fluminense University (UFF),

Brazil. The integration of disciplines such as “Reference and Information Services” and “Cultural Action in Information Units” is viewed as complementary for educating archivists and librarians as information and cultural mediators. The logical, axiological, and moral connections between these disciplines strengthen the social orientation of educating information specialists who acquire the ability to act as conduits of information, culture, and cultural diversity. The use of information technologies in the cybercultural society – such as information exchange, interactivity, collaboration, and digital tools – ensures active student participation in the educational process, contributing to the humanistic and social education of archivists and librarians (Barros De Moraes & Mendes Cabral, 2023).

Thus, a synchronous section of publications on training in library and information sciences has shown the current issues of special scientific research, which covers the following areas: trends in the use of educational programs in library and information sciences, digitisation of humanities in librarian training content, the alignment of LIS educational programs with labour market needs is crucial, digital competencies of librarians in the implementation of continuing professional education, humanistic, socio-demographic, and pedagogical aspects of LIS education (Fig. 2).

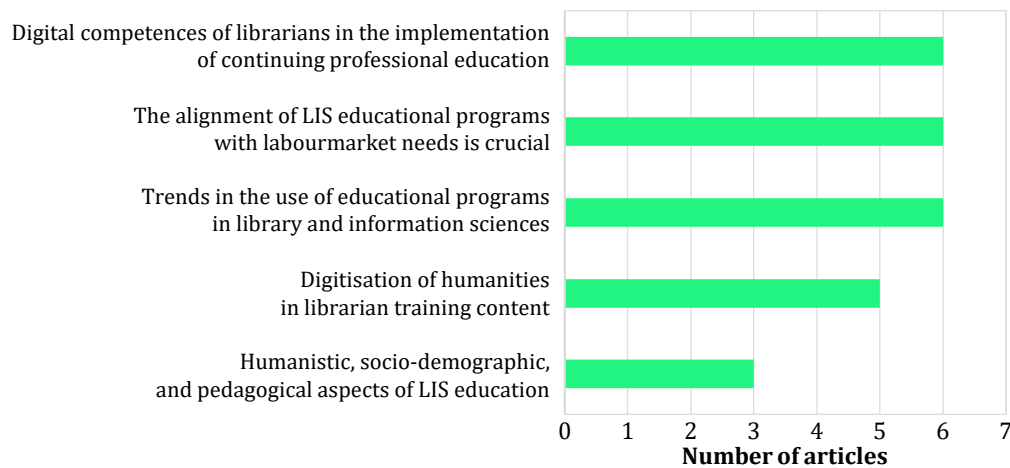


Figure 2. Relevant issues of special scientific research on LIS

Source: developed by the authors

Adhering to international educational standards and incorporating best practices in accreditation and educational activities during the initial stages of program formation enables the training of qualified specialists in LIS. Universities' participation in scientific discourse, even with modest achievements in mastering library and information sciences, facilitates their integration into the global scientific and educational sphere. Creative approaches to shaping educational content significantly enhance the attractiveness of obtaining bachelor's and master's degrees in LIS. The combination of program competencies and learning outcomes creates distinct focal points within educational programs and highlights the importance of incorporating digital literacy principles. Training specialists in library and information sciences contributes to raising the general educational level of the population, professionalising new segments of society, and enhancing information and library literacy across various foundational specialties. The deficiency in digital competencies among librarians underscores gaps in current educational programs and supports the argument for modernising educational strategies in specialist training, including the introduction of new educational programs and professional development. Education in library and information sciences, from socio-demographic and pedagogical perspectives, is rooted in the values of social justice, diversity, inclusion, open education, and scientific principles.

Conclusions

Digitisation and socio-demographic changes in humanitarian knowledge and the real economy have piqued significant interest among scientists and professionals in the experiences of educational institutions with long-standing educational traditions or those just beginning to offer library and information sciences training. Introducing educational programs in library and

information sciences expands the social, professional, and demographic subsystems of social relations, diversifies the market for educational services, and meets labour market demands. Key trends in educational efforts in LIS, at the intersection of digitisation across all social sectors and socio-demographic aspects of societal development, include: digital competencies of librarians as integral components of LIS educational program content and continuous professional development for library and archive personnel; the competitiveness of LIS educational programs hinges on their alignment with labour market needs; the prestige and popularity of the library and information sciences field depend on reshaping traditional notions of its social role, with libraries assuming a dominant role as information and analytical centers; the institutional mission of academic libraries is evolving to include participation in scientific research as partners and providers of scientific communication services; for pedagogy in library and information sciences to be innovative, it must prioritise social justice, ensure diversity, foster inclusion, advocate for open education, and adhere to scientific principles.

Modern specialists need to be proficient not only in searching, processing, storing, and utilising industrial information across both traditional and electronic media but also in generating new knowledge. Digital technologies are revolutionising the roles of library and archive professionals, emphasising the dissemination of new information and knowledge. These trends are prompting higher education to align with international standards and modernise the curricula in information, library, and archival studies.

Further research could focus on studying trends in the implementation of best practices in the development and implementation of educational programs in library and information sciences at universities worldwide, particularly within higher education departments in Ukraine.

Acknowledgements

None.

Conflict of Interest

None.

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Цифрові та соціально-демографічні аспекти поширення бібліотечно-інформаційної освіти

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Анотація. Процеси оцифрування в суспільстві впливають на технологічні, соціально-економічні та демографічні аспекти розробки та впровадження освітніх програм у бібліотечно-інформаційній сфері. Це призводить до зростання ролі бібліотек, архівів та управлінських структур як освітніх центрів. Мета статті – дослідити закономірності впливу цифровізації суспільства на технологічні, соціально-економічні та демографічні аспекти розробки та реалізації освітніх програм з бібліотекознавства та інформології в зарубіжних навчальних закладах. Методи дослідження – аналіз, синтез, логічні узагальнення, синхронний зріз, контент-аналіз. Результати дослідження свідчать, що включення освітніх компонентів з цифровізації та інформаційної грамотності до бакалаврських і магістерських програм, а також до програм післядипломної освіти для безперервного професійного розвитку фахівців сприяє підвищенню якості освіти та дотриманню освітніх стандартів у галузі бібліотечно-інформаційної справи. Конкурентоспроможність освітніх програм визначається їх відповідністю потребам ринку праці. Соціальна затребуваність і статус бібліотечно-інформаційної галузі залежать від відходу від традиційних уявлень про її суспільні функції. Інституційні функції академічних бібліотек розвиваються, оскільки вони беруть участь у наукових дослідженнях як дослідницькі партнери і надають послуги наукової комунікації. Інноваційна педагогіка в бібліотекознавстві та інформології передбачає дотримання цінностей соціальної справедливості, різноманітності та інклюзивності, а також доступності освіти і досліджень. Бібліотеки набувають домінуючого статусу інформаційно-аналітичних центрів. Цифрові технології докорінно змінюють характер професійної діяльності бібліотечних та архівних працівників. Ці тенденції зумовлюють трансформацію вищої освіти до міжнародних освітніх стандартів та модернізацію змісту професійної освіти. Практичне значення дослідження полягає в тому, що його результати можуть бути використані для вдосконалення та перегляду освітніх програм з бібліотечно-інформаційної діяльності

Ключові слова: освітня програма; наукова інформація; технічна інформація; програмні компетентності; програмні результати навчання; якість освіти