

Review Paper

# Economic Effectiveness of State Policy in Reforming Higher Library and Information Education in Ukraine

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## ABSTRACT

The article considers the conceptual and practice issues of reforming higher library and information education in Ukraine within state policy. Two-planes approach is applied: the study combines educational research and concepts of state policy efficiency evaluation with taking into account exogenous factors. The current state, problems and prospects of LIS education in Ukraine are considered in light of overall world trends in libraries development in the 21<sup>st</sup> century and best practices of some European states. The conclusion is made that in the last decade, there has been a transformation of the instrumental, that is, technological, model of the modernization of librarianship into a conceptual one focused on the implementation of the new socio-cultural mission of libraries in the knowledge-based information society, and, accordingly, LIS education should not only correspond but get ahead of libraries evolution, with a view on extremely rapid knowledge obsolescence. The model of evaluating economic effectiveness of state policy in reforming higher library and information education is proposed, which is rather universal that nation-state-oriented, as it allows taking into account the influence of specific factors of environment.

## HIGHLIGHTS

- The article is devoted to the analysis of current state and problems of higher library and information education in Ukraine in frames of applied state policy.
- The obtained results demonstrated the necessity of interdisciplinary approach to planning further development, as well as evaluation of LIS education state policy.
- The practical significance of the research lies in the development of universal model for evaluating economic effectiveness of state policy in reforming higher library and information education, allowing taking into account the influence of specific exogenous factors.

**Keywords:** LIS Education, Curricula, Innovation, Professional Skills

At present, everyone recognizes the growing role of the library in the expanding information space, but the development of librarianship is still given insufficient attention.

One of the many problems is the training of personnel for libraries. In our opinion, library and information education is an important factor

and a necessary component of the development of Ukrainian society. Namely this education

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contributes to the organization of the cultural genesis of society and forms the cultural code of the nation (Zoska *et al.* 2020).

The strengthening of the role of information in society brings the profession of a librarian to a different qualitative level, and with the advent of new specialties, it expands the scope of professional skills application. Library and information education today cannot be limited to the implementation of traditional curriculum options, but must include elements of innovation and creativity (Bird, Chu, and Oguz, 2015).

In the field of higher professional library and information education, the task of improving the quality of training human resources for libraries is relevant. The main characteristic of modern education is its continuity, education throughout life. Self-education, the ability to work with information are the necessary conditions for being in demand as a library specialist. Therefore, the ability to search for scientific and technical information by traditional methods and through the use of information technologies of education becomes extremely important.

Since the library network of Ukraine includes almost 40,000 book collections of various departments, state and communal ownership bodies, enterprises, organizations and institutions, it is clear that such a powerful network needs appropriate personnel support. Currently, the number of library employees is 67,000, but according to various estimates, from 30% to 60% of employees have more than 20 years of experience, so it is necessary to plan personnel renewal.

Specialists for the industry are trained by 24 educational institutions of the I-II level of accreditation with a total volume of graduation of up to 300 persons per year (educational and qualification level "Junior specialist"), 5 educational institutions of III-IV level of accreditation with a total volume of graduation of up to 220 persons per year (educational qualification level "Bachelor", "Specialist" (according to the new law on higher education in Ukraine, this category does not exist), "Master", and this number is obviously not enough for personnel renewal (Serbin and Yaroshenko, 2015).

The existing system of training librarians in universities of Ukraine is outdated, inflexible, does not take into account the real needs of libraries, lags behind international standards and global trends in library education, and has a weak material base for acquiring the necessary knowledge and skills. In this context, as Sheyko and Kushnarenko rightly note, the activation of European integration processes, the development of an open information society presupposes the designing of a conceptual model for the training of a modern librarian and a librarian of the future (Sheyko and Kushnarenko, 2019). Currently, there is a lack of scientific research on the problems of library education and prospects for its reform, and even more so in the systemic aspect, that is, research on the economic effectiveness of the state policy of reforming library and information education.

The relevance of the indicated problems is due to the fact that librarianship, like other branches of the national economy, overcoming the contradictions of the existing system of library services, can develop steadily only in the context of updating the philosophy of education. And it seems that the problems associated with the search for an education model adequate to the national economy should not be limited to considering the possibility of obtaining primary, secondary and higher professional education. It is legitimate to expect the effectiveness of this process only if it is carried out on the basis of a new paradigm focused on lifelong education and its prognostic character.

## LITERATURE REVIEW

Today, it is reliably known about the colossal achievements of Ukrainian scientists in the field of research into the history, state, and prospects of the development of library education in the fundamental science plane. In particular, scientists V. Babych, I. Davydova, V. Zagumenna, V. Ilganaeva, L. Kaliberda, U. Kraus-Läichert, N. Kushnarenko, T. Novalska, V. Pashkova, M. Slobodianyuk, A. Solyanyk, A. Chachko, V. Sheyko, G. Shemayeva paid a professional look at this problem.

It should be noted that library pedagogy is a scientific discipline that is being formed on the basis of the integration of pedagogy and library science. Its subject is the problems of reading theory, library

and pedagogical activities, the solution of which will allow the younger generation to become familiar with the world of book culture, will allow the use of literature and other information sources as the most important means of education and upbringing of a growing person, the formation of his reading culture and information culture.

The formation of library pedagogy as an independent scientific discipline is due to two interrelated groups of factors: first of all, the development of Ukrainian domestic library science as a complex, dynamically developing system, the emergence of new research strategies in it; secondly, the needs of science in studying the pedagogical aspects of the activities of libraries (Chukanova, 2015).

Modernization of the system of training specialists in the library and information sphere within the framework of lifelong education is based on the formation of the continuity of its main stages, the achievement of the adequacy of the level of professionalism of library workers to the information needs of society, the development of personal and creative abilities of subjects of activity.

It should be noted that the problem of the continuity of different educational levels for pedagogical science and practice is not new. Researchers in this area focus on various aspects and forms of relationships between elements of the lifelong education system. There are several approaches to studying this issue (Klymenko *et al.* 2016; Kryshtanovych *et al.* 2022). One of them includes the study of the interaction of well-known links of the state educational system: preschool educational institutions - general education school - schools and colleges of primary and secondary vocational education - university - postgraduate studies - advanced training and retraining. The other is represented by supporters of the so-called "content direction", who focus on considering the sequence in which a person acquires knowledge and the given content of each educational level (Ishwar, 2019). At present, there is also an activity-focused study of lifelong education. According to representatives of this scientific direction, the mechanism of functional connection between the links of the lifelong education system is the learning process, which forms the ability for self-determination and self-realization of students (Huggins, 2017).

In turn, based on the activity-focused approach to the study of the analyzed phenomenon, it is legitimate to assume that the effectiveness of the training and formation of human resources for the library and information sector will be achieved only in the case of basing on a triune complex consisting of pre-university training, university education, and postgraduate education. For each stage of the lifelong education system, its goals, objectives, and priorities are determined.

In particular, the main tasks of pre-university training should be seen in revealing the social meaning and content of library work, ensuring continuity between general and professional education, including better preparation of school graduates for entering a university and mastering higher education programs (Deyneha *et al.* 2016; Akimova *et al.* 2020).

The problem that arises in this regard is to substantiate and build at the stage of pre-university training such unifying meta-disciplines that could ensure the formation and development of a person's abilities, which determine his professional success in the future. At the same time, it is necessary to first decide which professional skill or personal quality is the basic and backbone one for the library profession. In other words, namely during this period school students are immersed in the system of basic values of a library and information specialist. In this case, speaking about values, we mean the ethics of the profession, its philosophy, world-view principles that determine the social mission of a specialist, the boundaries of what is necessary and possible in his professional activity from the point of view of the moral norms of society and the ethical code of the corporate community.

Currently, as a rule, the system of pre-university training includes motivational-value, cognitive-intellectual, and psychological-communicative components that ensure the quality of educational programs implemented at this stage of continuous education. Courses and extracurricular activities are structured in such a way as to help students in professional self-identification and productive mastering of the educational environment. At the same time, technologies of individual-creative, personal-activity and dialogic approaches are used. An important methodological principle of

organizing the educational process at the stage of pre-university training is the implementation of an acmeological approach based on the development of the creative potential of students (Kalyayev *et al.* 2019; Kryshchanovych *et al.* 2022). The priority direction in the organization of the educational process is the use of innovative forms of education: business games, competitions, presentations of educational projects, modeling of business processes and operations, etc.

The main feature of the pre-university educational process is the differentiation of education. At each educational level, differentiated learning is characterized by a difference in the forms used and the essence of the content.

As a rule, at the initial (propaedeutic) stage of education, students are given the opportunity to build their own individual educational trajectory through demonstrating the essence of various professions and the prospects for professional education, characterizing educational institutions and their educational programs, getting to know graduates who have achieved a certain professional success, studying labor market offers (Gaman *et al.* 2022).

The logical conclusion of this educational stage should be the decision of school students to continue their education in one of the areas of specialists training at the university, including the direction of library and information activities.

The next stage of pre-university training is most often considered by scientists and practitioners as a period of profiling education, thanks to which high school students make a choice of an educational program based on their interests, abilities and intentions in relation to continuing education (Raju, 2021). At the same time, there is an in-depth "immersion" of students of specialized classes in the future profession. Achievement of this goal is carried out through the formation of an attractive image of the library profession, the conduct of career guidance diagnostics of older students, the formation of the foundations of professional knowledge.

The effectiveness of the set target will depend, first of all, on the conditions created for the formation of an individual educational request in older students, a personal need for a balanced choice of

the direction of education, a conscious choice of a future profession. It seems that the main attention at this stage should be given to revealing the essence of library work and the prestige of the profession. The study of these issues is given a focus in the course "Introduction to the specialty", which opens a block of special disciplines in pre-university training programs. The prestige of the profession is a measure of the social value and functional significance of libraries in society (Litvinova *et al.* 2020). That is why the course program should be based on the study of issues related to the activities of great known librarians, the formation and functioning of the largest libraries in Ukraine and other countries, the state of regional library systems and their role in the economic and socio-cultural development of the territory.

As it is known, the cognitive effect is enhanced by emotional and visual ways of perceiving information (Rozskazov *et al.* 2021). To this end, it is advisable for students to organize excursions to large libraries and information centers of the region, which provide an opportunity to get acquainted in practice with the heritage of library systems (Khomik *et al.* 2021).

It should be noted that the stage of formation of an attractive image of the library profession among school students is one of the most difficult in pre-university training. It is well known that the status of the profession has an active influence on the formation of a professional image. At the sectoral level, the concept of "status" directly reflects the position of the social role of the profession on the scale of roles in society and indirectly reflects the social need for this professional activity (Malhan, 2016; Miwa and Miyahara, 2015). Currently, according to scientists and practitioners in the field of librarianship, the prestige of the profession of a librarian in society is steadily falling. Among the factors that have a negative impact on the choice of a library profession, there are the low level of material well-being of library workers, the lack of career prospects, poor working conditions, heavy physical exertion, etc. But as experts rightly point out, this state of affairs is largely provoked by the unsatisfactory level of professionalism of modern librarians: "The right to work in a library must be earned. Previously, back in the 19<sup>th</sup> century, far from everyone was taken to work there, they were

checked in work, in communication with readers ... The most respected scientists stood at the head of the libraries professors, deeply educated and widely known in society" (Goulding, 2017).

At present, the profession is open to everyone, including those who have made a choice unconsciously (Panasiuk *et al.* 2020). In order to avoid the entry of 'random' people, weakly oriented in their future professional activities, into the profession, career guidance diagnostics should be carried out.

The rapid development of technologies and digital content, the emergence of new models of information exchange and knowledge dissemination systems have led to significant changes in the field of library and information education (Novikova *et al.* 2021). The main educational trend has been the expansion of interdisciplinary links with information, management and behavioral sciences, the convergence of information disciplines and, in a significant number of cases, the inclusion of LIS in the broad field of information sciences as one of the significant components (Olubiyo, 2022; Raju, 2021; Wang, 2018). The increased role of a practice-oriented approach in learning (Huggins, 2017; Wyman and Imamverdiyev, 2018), the spread of online education and digital educational initiatives (Kuzmina *et al.* 2021; Pujar and Tadasad, 2016; Shem, 2015; Wójcik, 2015), restructuring of the courses taught and the diversity of their delivery vehicles (Horvat *et al.* 2017) are also noted as major changes. In the context of ongoing transformations, it is important to study the needs and expectations of students as one of the participants in the educational process interested in its results.

To study trends and ways of developing library and information education in the digital age, it is important not only to determine the knowledge, abilities, and skills of students, but also to track and understand their opinions about the educational process, features of professional development, plans and prospects for further employment. Modern students are mostly active, creative, independent, demanding, not afraid of difficulties. Being direct consumers of educational services and active participants in the educational process, they are ready to critically and boldly identify the problematic and promising areas of this process, and express their expectations. Accordingly, the reform

of higher library and information education should take into account these trends (Panasiuk *et al.* 2021). The most important task of the vocational education system is to improve the quality of student training to the level of employers' expectations only in this case, it is possible to achieve the economic efficiency of educational reforms.

## MATERIALS AND METHODS

The methodological basis of the study was the general philosophical provisions that reveal the evolution of vocational education, the mutual influence of the general, particular and singular in the library and information educational system, the unity of the historical and logical approaches to the study of the social life of society. Research methods are determined by the interdisciplinary nature of the object, as well as the range of tasks identified in the study. Methods of theoretical and empirical analysis of publications were used to identify the degree of development of the problem, a bibliographic method to identify sources on the topic. Using the method of comparative analysis, the qualitative characteristics of the content of education were determined.

## RESULTS

The period of the late 20<sup>th</sup> - early 21<sup>st</sup> century appeared to be a turning point in the history of the development of education around the world. The transition from an industrial to an information and knowledge society leads to significant changes in many areas of human activity, in particular, in higher education. It should be noted that the nature of the development, acquisition, and dissemination of knowledge is changing, opportunities are opening up for updating the content of education and teaching methods, access to higher education is expanding, and the role of the teacher in the educational process is changing. In this regard, deep and objective processes of formation of a single open educational space of higher education are taking place in the world, including Ukraine. However, it became obvious that the formation of a single information and educational space, the widespread use of information and telecommunication technologies, the receipt of a variety of information by a person, even if it is complete and high-quality, does not always lead to awareness and does not

guarantee the success of the educational process, since the information must undergo analytical and synthetic processing and become personal knowledge (Novak *et al.* 2022). This fact determines both the formation of a new approach to the development of students' competence and the need to search for new educational technologies.

In modern conditions of socio-economic transformations, the formation of a system for training professional personnel is taking place, the distinctive features of which should be the modernization of vocational educational programs, the mobility of students and teachers, integration into the world educational system, and the widespread use of new information technologies. The ongoing processes of globalization have a significant impact on the concepts of vocational education. At the same time, training of future human resources in different countries is carried out taking into account national cultures, economic and social development, and so on.

The influence of the idea of the Bologna Declaration on the creation of a single European educational space makes it necessary to develop a single standard of education, taking into account the experience and specifics of the development of the education system of each of the participating countries. Differences in the standards of education among countries require the solution of significant methodological problems, among which one can highlight the understanding of development strategies, ensuring the readiness of pedagogical and managerial personnel for conscious action, identifying the conditions and resources for the development of the education sector. The process of creating a European system of unified educational cycles, academic degrees and qualifications affects increasingly more countries. The goal of improving the education system is to enhance the quality and competitiveness of European higher education as whole. The results of studies confirm the diversity of the currently existing curricula for the training of library personnel and the lack of a single conceptual framework for their modernization and unification (Sheyko and Kushnarenko, 2019). However, some general tendencies of institutional and cognitive changes in the system of European library education have nevertheless emerged.

The European choice of Ukraine, declared as the most important landmark of the country's strategic development in the first quarter of the 21<sup>st</sup> century, has become decisive for the transformation of all spheres of society's life, including the choice of the vector of educational reforms (Gupta *et al.* 2021). The "National Doctrine of the Development of Education" emphasizes the aim of reforming the domestic system of training for integration into the European educational space by increasing international competitiveness and the quality of educational services. Ukraine's accession to the Bologna process requires adjusting the content and structure of educational programs, taking into account the best European educational practices, identifying innovative experience and opportunities for its implementation in the domestic system of higher education, including library and information.

However, many questions were raised to which there are still no unequivocal answers:

- ◆ Whether it is possible and whether it is necessary to train a "universal" librarian, ready to work in a library of any level and in various areas of work, or still specialization is necessary?
- ◆ How to fill the content of studies in the Master's degree, and what competencies should be acquired by Masters in the field of library science?
- ◆ Should special interdisciplinary disciplines be included in librarian training plans, and what content should they acquire in training librarians (for example, information security, information protection, information wars, copyright, etc.), what criteria of qualimetry (measurement of the quality and effectiveness of educational process) are needed, etc.?

A comparative analysis of the European experience in the training of library and information personnel makes it possible to identify the main approaches to its organization and content, to objectively comprehend the achievements and problems of the leading library science schools, and to predict the directions and consequences of future educational transformations.

Regarding the structural transformations of educational programs, the vast majority of European higher education institutions are introducing a

three-level qualification system for training library and information personnel: bachelor - master – PhD. These three levels involve a gradual deepening of professional specialization by studying an extensive cycle of fundamental and general professional disciplines at the undergraduate level (it is a minimum of 180 - a maximum of 240 ECTS) to highly professional educational programs in a Master's program (amounting to a minimum of 60 - a maximum of 120 ECTS).

Under the influence of fundamental changes in the structure of information resources and channels of access to them, the rapid pace of development of computer and telecommunication technologies, the electronic convergence of documentary subsystems of society, the content of bachelor's educational programs is increasingly oriented towards interdisciplinary approaches that provide training of library and information personnel of a wide profile, capable of performing the functions of communication intermediaries not only in libraries of various types, but also in documentation centers, publishing houses, archives, museums, media structures, advertising and PR agencies (Gavkalova *et al.* 2022). Thus, for example, in one of the best library schools in the UK (School of Library, Archive and Information Studies, University College London SLAIS UCL), on a single cognitive and organizational platform, they train bachelors of library, information and archival management, publishing, Masters of library, archival and information research, PhDs in library science and informatics (Horvat *et al.* 2017).

In France, the library and information profession is defined as a set of areas "librarian", "archivist", "documentary expert", united by a single functional field of activity and a single educational space (Kryshtanovych *et al.* 2021). Many French universities form a common core of fundamental and professional disciplines for training specialists in such related specialties as book science, enterprise records management, scientific and technical information and documentation, information and communication, document engineering, cultural and documentary national heritage, museology, multimedia and information technology, information management, etc. (Pei, 2016).

Similar processes are taking place in Germany the library departments of universities significantly update the list of specialties, providing training

for bachelors in the following areas: "Library and Information Management", "Library and Media Management", "Information and Scientific Management", "Information Design", "Economics of Information", "Knowledge Management" (Pei, 2016). The consequence of these trends are also institutional changes in the system of training of future specialists for labor market in European countries there is a merger of universities with similar profiles and diversification of specialties related to the information sphere. For example, the Stuttgart Institute for Library Science and Information merged with the Vocational School for Media and Printing to become the Media Institute. At the same time, along with the preservation of classical library science educational programs, the Institute is actively developing areas related to the training of specialists in the field of web design, information and media management, public management, knowledge organization, providing information for target user groups doctors, musicians, teachers, engineering and technical workers.

While the qualification level of the European bachelor is focused on the training of middle managers, in the Master's program in the direction of "Library and Information Sciences" the student has the opportunity to deepen his specialization, having, as a rule, at least a year of work experience in either library or other socio-cultural, media, information, publishing, archival, or museum institutions (Kulikov *et al.* 2022). It is obligatory to write a Master's thesis related to the implementation of a real project, dedicated, for example, to the digitization of archives, automated indexing of web documents, library pedagogy or music information management.

Many leading European universities are actively developing such a new organizational form of training competitive personnel as an international Master's program, where teaching is conducted in English. No less valuable for studying and borrowing foreign experience in Ukraine is the introduction by many European universities of Master's programs for Bachelors who do not have a specialized library and information education. The curriculum of such a Master's program is designed not for one and a half, but for two years of study (120 ECTS) and provides a high level of retraining

of graduates with philosophical, pedagogical, technical, and other education (Levytska *et al.* 2022). Master students, as a rule, undergo an internship in library institutions (its volume is one variable module 10 ECTS) and defend a Master's thesis, which must be written in terms equivalent to six months of full-time study, that corresponds to 30 ECTS.

At present, the collegial efforts of representatives of the Departments of Library Science of the leading universities of Ukraine, aimed at graduating highly qualified library personnel, are aimed at finding optimal criteria for delineating professional competencies and the content of educational programs for the preparation of junior bachelor, bachelor, master manager and master researcher, Ph.D. Now, an approximate nomenclature of mandatory fundamental and professionally oriented academic disciplines for undergraduate studies has been discussed and preliminary agreed, which makes it possible to put forward proposals on the content of the SPE of a master manager and master researcher (Sheyko and Kushnarenko, 2019). Thus, it was decided to include the following courses in the cycle of fundamental disciplines of the curriculum for preparing a bachelor in the educational direction "Book Science, Library Science, and Bibliography": "Documentology", "Social Communications", "Analytical and Synthetic Document Processing"; in the cycle of disciplines of professional and practical training "Book Science", "Library Science", "Bibliography", "Library Fund Science", "Information Retrieval Systems", "Library and Information Service", "Automated Library and Information Systems and Technologies", "Electronic Library", "Information Law", "Management and Marketing of Library and Information Activities". The variable part of bachelor's training, which takes up to 50% of study time, is formed by universities taking into account the profiles of study chosen by students, as well as the specifics of the future place of work and the requirements of the regional labor market (Sheyko and Kushnarenko, 2019).

Taking into account the content of the invariant component of the bachelor's training, focused on the in-depth formation of a complex of professional competencies in the production and technological orientation among specialists of this qualification level, it is advisable to offer the educational and

professional program "Management of library and information activities" (90 credits) for the preparation of a Master of management profile, and for the preparation of a research Master the educational and scientific program "Theory and Methodology of Book Science, Library Science, Bibliography Science" (120 credits).

A solid methodological basis for choosing the nomenclature of the compulsory fundamental and professionally oriented disciplines of the curricula of the named Master's programs was the "Content structure of the constructive model of the educational program for the library and information Master" proposed by A.V. Sokolov and Yu.N. Stolyarov (Sheyko and Kushnarenko, 2019). Thus, for the educational and professional program for the preparation of a library Master-manager (90 credits), the following academic disciplines are offered as mandatory fundamental: "Philosophy of information", "Theory and methodology of socio-cultural design", "Electronic communication"; in the cycle of disciplines of professional and practical training: "Library Political Science", "Library Culturology", "Library Professiology", "Library Ecology".

For the educational and scientific program for the preparation of a library master-researcher (120 credits), the following academic disciplines are offered as mandatory fundamental ones: "Philosophy of Science", "Organization and Methods of Research Work"; "Pedagogy of Higher School"; in the cycle of disciplines of professional and practical training: "Theory and methodology of book science, library science, bibliography", "Methods of teaching special disciplines", "Library pedagogy and psychology", "Communications in science".

The need to maintain conceptual unity and continuity in the system of training library personnel of different qualification levels obliges universities to minimize duplication in the content of the curricula for the preparation of a master-researcher and a doctor of philosophy. Taking into account the need, stipulated by the regulatory documents, to allocate part of the study time for in-depth mastering of a foreign language (12 credits), scientific methodology, knowledge management and business planning of scientific projects (at least 6 credits) by postgraduate students, it is important to consider filling the cycle



of fundamental disciplines aimed at studying the basic concepts of theory of social communications, history and futurology of bibliology, library science, bibliography as a single scientific specialty (12 credits), as well as to develop a solid range of elective disciplines.

Based on the activity-focused approach to the study of the analyzed phenomenon, it is legitimate to assume that the effectiveness of the training and formation of human resources for the library and information sector will be achieved only in the case of basing on a triune complex consisting of pre-university training, university education and postgraduate education, enabling 'shaping' employee capable of working with any categories of clients in dynamic environment (Karpa *et al.* 2021; Khan *et al.* 2021). For each stage of the lifelong education system, its goals, objectives, and priorities should be determined.

One of the prognostic issues is the question of a promising vector for the training of library personnel. As part of our field study in a number of Ukrainian universities, respondents were offered a choice of four options that reflect the approaches and conceptual focuses of research into the development of library education that have been established in world practice: information technology (information disciplines as the basis of training); humanitarian (culture, art, creativity as the basis of training); social (social communications, analytics as the basis of training); multidisciplinary training without priority areas. Interviewed students see information technology as a promising vector for training library personnel 44% of answers, almost half as much are interested in multidisciplinary training without priority areas 24% of answers, 15% of answers were in favor of humanitarian and social vectors.

Indicative in this context is the list of academic disciplines offered by the students surveyed for improving library and information education. A significant part of them include proposals related to IT technologies and digitalization:

- ♦ Remote user servicing (electronic delivery of documents, execution of information inquiries, etc.);
- ♦ Programming;
- ♦ Digital technologies;
- ♦ Neural networks;

- ♦ Nanotechnologies,
- ♦ Digital marketing, marketing automation; SMM
- ♦ Basics of web design;
- ♦ Work of the library with social networks;
- ♦ Promotion of libraries and information centers in social media; digital environment as a place to promote library resources and services;
- ♦ Digital library management;
- ♦ Information Security (Guseva *et al.*, 2022);
- ♦ Basics of working with video format;
- ♦ Design of electronic resources, their creation, the basics of working with graphic editors, the basics of working in photo and video editors;
- ♦ "Visuals" of social networks;
- ♦ Tools for advertising activities in the digital environment;
- ♦ Work with programs and applications to create content for the website and social network pages of libraries;
- ♦ Website development starting from early years of study.

A separate block includes proposals for teaching social communications, library copy-writing, library journalism, organizing editorial activities, and typography. Such proposals are quite expected, since they correspond to modern trends in the development of library practice and the interests of student youth in general; at the moment, they are already finding their implementation in the educational process of some faculties of information and document communications and are separated into independent academic disciplines ("Algorithmization and basics of programming", "Databases", "Library computer networks", "Software and hardware", "Designing automated library and information systems", "Editorial and publishing activities of libraries", "Technology for creating websites", "Technology for creating databases in libraries", "Digital libraries", etc.) and topics in academic disciplines (for example, in the program the academic discipline "Library and Information Marketing" includes the topic "Trends in the development of marketing of library and information activities", the content of which discusses the benefits of Internet marketing,

marketing of Internet communications, non-commercial Internet marketing tools, etc.).

In the proposals of the students surveyed, in addition to those indicated above, there were data analytics, information analytics, culture of speech, culture of communication, aesthetics, psychology of business communication, psychology of management, project activities of libraries, statistics, library management (a teacher-specialist who occupies or held a leadership position in the library), foreign librarianship, psychology at a professional level, source studies, local history activities (Troschinsky *et al.* 2020).

Respondents were asked several questions about the importance of various types of library work in the digital environment and the readiness of students to perform them after graduation. Assessing on a five-point scale the importance of various types of library work in the digital environment, out of eight proposed positions, the students surveyed noted “work with electronic catalogs and databases” as the most important ( $X_{av} = 4.85$ ), as the least important “work with social networks” and “work to promote library products and services” ( $X_{av} = 4.55$ ).

According to the same positions, the respondents were proposed to assess their readiness to implement the types of work of the library in the digital environment and it is noteworthy here that the students define “work with social networks” as the type of work for which they are most ready ( $X_{av} = 4.47$ ). Least of all, the students surveyed consider themselves ready for “work to create electronic information resources” and “work to provide access to electronic information resources” ( $X_{av} = 3.61$  and  $X_{av} = 3.73$ , respectively).

Thus, determining the importance of various types of library work in the digital environment on a five-point scale, the students surveyed rated all the proposed positions more or less equally, while in assessing their own readiness for their implementation, students are not fully prepared for “the work of creating electronic information resources” and “work to provide access to electronic information resources”, which is important to consider when developing and implementing relevant training courses in the educational process or strengthening the practical component of existing academic disciplines.

The main task of the competency-based approach in education is to bring the education received by the student in line with the needs of the professional sphere. In other words, it is necessary to create such a model of education in which the student will be maximally immersed in professional activities (Gupta *et al.* 2021). The knowledge acquired by students during the period of traditional education must be integrated into the professional situation, its subjective analysis this is what determines an effective way to form the competence of a future graduate.

The issues of formulating competencies and their division into groups remain debatable and are actively discussed by the professional community. On the one hand, the educational standard has outstripped the creation of a professional standard, and therefore the competencies are not sufficiently aligned with the requirements of library practice. On the other hand, the implementation of the competency-based approach implies the formation of such important professional qualities in future bachelors as the ability to independently solve professional problems, the ability to navigate in an ever-increasing flow of special information, conceptual and innovative thinking, and, most importantly, awareness of the social significance of their future profession and high motivation to perform professional activities. All of the above puts forward new requirements for teaching methods that have not yet been fully developed and tested.

The solution to the problem of the formation and development of real professional skills of students, to a certain extent, is the introduction of interactive forms of classes into the educational process with the involvement of potential employers.

Meanwhile, a systematic, that is, socio-economic analysis of the state policy of reforming higher library and information education, is a very difficult task in the current conditions of high dynamics of socio-economic processes.

It is easy to see that when solving problems of assessing the effectiveness of the activities of government bodies, the central methodological problem is the construction of an appropriate system of statistical indicators.

A special analysis of theoretical and methodological problems in assessing the effectiveness of public

administration reveals the high complexity of the problem and its significant differences, for example, from assessing the economic efficiency of investment projects. The construction of methods for evaluating economic efficiency is based on the existence in theory and in practice of a single indicator that integrates the action of all factors of production profit. There is nothing of the kind in the problems of evaluating the effectiveness of public administration, where the methods used can contain several hundred qualitatively different indicators, which can be brought together only on the basis of cumbersome mathematical procedures, which, moreover, do not have 'proving force'. Moreover, the primary assessment indicators themselves have a number of important features that allow us to highlight the following important aspects:

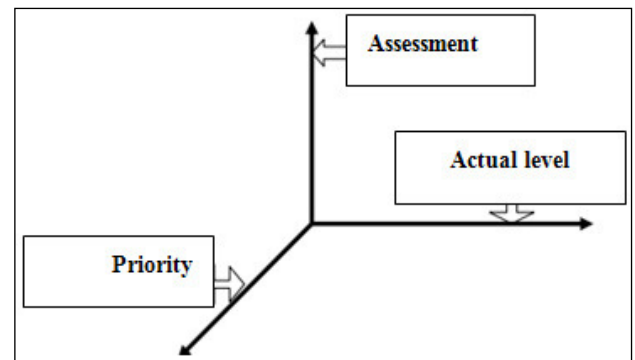
First, the performance indicators of public administration in the simplest case are a quantitative characteristic of the state of the corresponding socio-economic problem in a given territory. The substantive classifications that have been established for many decades divide statistical indicators into absolute and relative, natural and cost, quantitative and qualitative, private and integral, etc. The problems of their construction and use are well studied and displayed both in many textbooks and in publications of professional statisticians, so we will not dwell on them in detail.

Secondly, the results of calculations of absolute or relative indicators for the results (efficiency) of public administration in practice are not at all the end result intended for use by managers or analysts. After the calculations, as a rule, the second stage of the analysis of the current situation begins a comparison of the calculated indicators with the requirements for their level on the part of the state, civil society institutions, certain social groups, etc. In other words, the indicators of the results of the activities of the authorities also have a "second dimension", which is reflected, as a rule, in the systematically used assessments of the state of affairs. The importance of this stage is so great that a special term was even introduced for it "social diagnostics of an object" this is a technological procedure aimed at studying and assessing the state of an object, taking into account the requirements of the current situation, current social standards, and management goals (Hendren, 2020).

The typology of performance indicators allows to further pose the main question: how, in fact, can estimates be constructed for certain characteristics of socio-economic development? In this case, we are faced with the following alternative:

- (a) The formation of subjective assessments such as "poor - good", "unsatisfactory-satisfactory", etc.
- (b) The formation of objective estimates, which can be obtained only after comparing the given value of the indicator with one or another value of the established criterion. A variant of this approach is the use as criteria for evaluating the characteristics of the "champion object", which has achieved the best results for this indicator in this group of objects. This approach is often used when Ukraine's achievements are compared, for example, with the best results in world practice.
- (c) The evaluation criterion is social and economic standards, norms and regulations.

Thus, we come to the conclusion about the three-dimensional structure of each indicator (Fig. 1).



**Fig. 1:** Three-dimensional structure of performance indicators for state policy.

Comparison by similarity is the most popular and frequently used method in practice. This method can be applied not only when working with cross-sectoral data, but also modified to work with panel data. However, a serious drawback of comparison by similarity lies in the fact that the bias caused by the action of unobservable (latent) characteristics remains unaccounted for in particular, there are differences in the socio-economic and cultural landscape of Ukraine and Western European or North American countries.

More reliable methods for estimating the indirect effects of government programs are currently being developed, mainly based on the use of the concept of general equilibrium.

In practice, as a rule, ROAMEF (rationale, objectives, appraisal, monitoring, evaluation and feedback) cycle is playing the role of efficiency metrics across the stages of the policy cycle. Charlesworth, Or, and Spencelayh (2016) call it a “stylized framework for rationale policy development”.

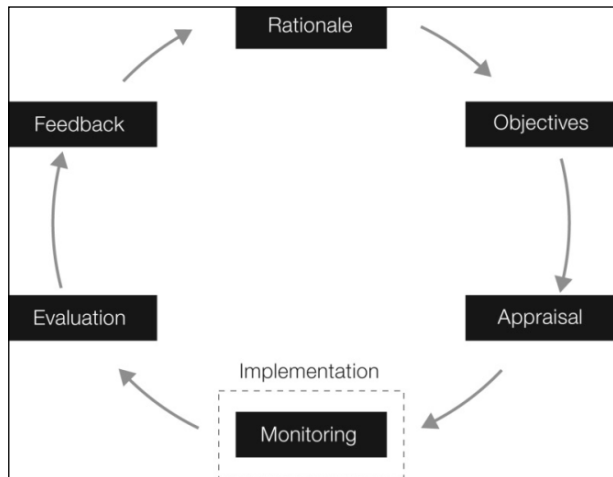


Fig. 2: The ROAMEF cycle

In reality, “policy development diverges from this cycle, which is highly stylized and excludes key factors such as political context, values and events. The model is used as a theoretical framework rather than a description of policymaking in practice” (Charlesworth, Or, and Spencelayh, 2016).

Given the limitations of mainstream methods in social policy evaluation, it is important for policy analysts and implementers to broaden the measure of outcomes. “Comprehensive outcomes evaluation empowers a study to map causal pathways that brought about culmination outcomes, while providing more complete information on the nature of heterogeneous impacts and crucial interactions that either compounded or weakened outcomes” (Samson *et al.* 2015).

Our opinion is that using an output-oriented program is advised if the goal is to assess a group of units’ behavior while working with a limited budget and aiming for the best outcomes. The dual program is the most popular option when it comes to formulation:

$$\text{Max } \varphi + \varepsilon \sum_{i=1}^m s_i^- + \sum_{r=1}^s s_r^+$$

$$\text{s.a. } \sum_{j=1}^n x_{ij} \lambda_j + s_i^- = x_{i0} \quad i = 1, 2, \dots, m$$

$$\sum_{j=1}^n y_{rj} \lambda_j - s_r^+ = \varphi y_{r0} \quad i = 1, 2, \dots, s$$

$$\lambda_j \geq 0, s_r^+ \geq 0; s_i^- \geq 0 \quad j = 1, 2, \dots, n$$

where  $\varphi_0$  is the efficiency score,  $\varepsilon$  is infinitesimal non –Archimedean,  $\lambda_i$  are the weightings and  $s_i^-$  and  $s_i^+$  are, respectively, the outputs’ and inputs’, slacks. As comparison to other units, the producer is relatively efficient if the score is equal to one. If the score is less than one, the unit being tested is ineffective because the sample also includes more effective units (those which perform better).

This program’s formulation is particularly appealing since it enables for the detection of potential input reductions or output increases in specific situations utilizing the slacks estimated for each variable, in addition to assigning an efficiency score to each unit. This intriguing data is supplementary to the efficiency score’s information and may be very helpful in locating the potential cause of production inefficiencies.

These models, usually known in the literature as regression or second stage analyses, consider non-controllable inputs ( $Z_j$ ) as explanatory variables in a regression where the dependent variable is the initial efficiency score ( $j$ ) (Samson *et al.* 2015). Once  $j$  are estimated, the initial scores are corrected according to the values of exogenous factors for each unit.

These models, which are often referred to as second stage analyses or regressions in the literature, take non-controllable inputs ( $Z_j$ ) into account as explanatory variables in a regression where the dependent variable is the initial efficiency score ( $\theta_j$ ) (Samson *et al.* 2015). The initial scores are revised based on the values of exogenous factors for each unit once  $j$  are estimated.

$$\Theta_j = f(Z_j, \beta_j) + u_j$$

To avoid any unit having a lower estimated score after the correction, this adjustment can be applied directly using the expected values or by using the method suggested by Greene.

The literature provides other more complex multi-stage applications, based on employing the total slacks (radial and non-radial components) produced in the first stage, in addition to regression or second stage models. These models seek to separate the slacks into those related to producers' own technical inefficiency and those explained by the impact of non-discretionary inputs. The effect of exogenous factors can be discounted by adjusting the values of variables (controllable inputs and outputs) as a result of this decomposition. The final step, which is the same for all models, entails running a new DEA with the corrected variable values assigned to each unit's noncontrollable inputs. The new estimated scores establish exclusively the efficiency level at which each producer operates.

A DEA that incorporates slacks as controllable inputs and non-controllable outputs serves as the mechanism for decomposing various components. This presents the challenge of minimizing inputs (slacks) while taking into account the value of the outputs (non-controllable inputs). In other words, the goal is to ascertain how much the former can be diminished while assuming that the value of the latter remains constant.

$$\begin{aligned} \min \quad & \beta_0 \\ \text{s.a.} \quad & \sum_{i=1}^l \lambda_i \chi_{fi}^- s^- = \chi_{f0} \\ & \sum_{i=1}^l \lambda_i [(1 - \theta_0) \chi_a + s_d^+]_i + s^+ \\ & = \beta_0 [(1 - \theta_0) \chi_a + s_d^+]_0 \\ & \sum_{i=1}^l \lambda_i = 1 \\ & \lambda_i, s_d^+, s^- \geq 0 \end{aligned}$$

where the following equation represents the total slack found in the first stage for each producer in the variable  $\chi_d$ :  $[(1 - \theta_0) \chi_d + s_d^+]_i$ . Using this procedure, the achievable aim for each unit is determined, taking into account how many non-discretionary inputs it has. These objectives enable the determination of the percentage of the slacks that can be attributed to the impact of outside factors,  $\beta_0 [(1 - \theta_0) \chi_d + s_d^+]_0$  and what is due to inefficiency,  $(1 - \beta_0) [(1 - \theta_0) \chi_d + s_d^+]_i$ . The values of inputs and outputs can be corrected following the original model or the alternative option proposed by Muniz.

Its main benefit is the use of non-parametrical techniques at every stage of the analysis, which is very helpful for overcoming bias issues that are common in the estimation of regressions using econometric techniques, as well as where there is ignorance about the productive process in fields like education.

## DISCUSSION

Professionally significant for a library specialist is his communicative culture: the ability to speak, persuade, listen, conduct a conversation, etc. In addition, librarians should have a foundation of knowledge in social and general psychology adapted to the area of library practice. Because of this, curricula of specialized training in the direction of library and information activities should include the study of "Psychology of communication", "Speech culture", "Business etiquette". The development of communicative qualities and psychological skills is promoted by conducting trainings on various topics, *r* application of case study methods similar to those (methodically) applied in business studies. Thus, the training "Readers' Preferences" allows deepening knowledge of the psychology of library communication, mastering the art of establishing psychological contact between a librarian and a reader, identifying possible aspects of the influence of a librarian on reading of library users, etc.

It is also worth noting the need to form the linguistic culture of the future library specialist. Within the framework of pre-university educational programs, it seems preferable to dedicate a significant number of hours to the study of the Ukrainian language and stylistics. In addition, in the form of extracurricular activities, students can gain deeper knowledge in a foreign language.

The training of specialists in library and information activities in higher educational institutions is an integral part of the system of continuous library education. There is no doubt that changes in the ideological, social, and economic essence of librarianship were reflected in the target settings for training specialists in universities and transformed their educational programs.

As noted by many scientists and practitioners, it is currently necessary to create a new model of relations between the state, libraries, and readers, which is adequately combined with state and market

regulation of the “library economy” (Klyuev, 2018; Xiao, 2016; Xue *et al.* 2019). Moreover, the creation of such a model will be done not by the state and not by society, but by the library specialists themselves. Such a situation, of course, should also affect the content of the training of a library manager through the strengthening of the economic aspect in education. Therefore, it is absolutely reasonable to single out issues on the economic development of libraries in the curriculum for training managers of library and information activities as an independent discipline.

In addition to knowledge in the field of economics and economic activities of libraries, students, studying in managerial specialization, must master the skills that will allow them to effectively organize library production as a whole, skillfully manage library staff, and competently build HR policy. The implementation of this occurs through the assimilation by students of the materials of the courses “Library Management”, “Management of Libraries”, “Marketing of Library and Information Activities”, “Legal Support of Library and Information Activities”, etc.

Meanwhile, the framework of the educational standard and dynamically changing management and library technologies do not allow to “arm” students with a number of skills and abilities that are significant for managers. For example, the speech culture of a leader is one of the important components of his managerial success, positive perception by the team and the public. The importance of speech training in recent years has increased significantly due to the expansion of the boundaries of professional communication and the participation of libraries in various scientific, socio-cultural, and other forums. It is worth noting the dynamically developing vocabulary of professional terms and everyday vocabulary. Without doubting the need for this training for future library managers, we can, unfortunately, state the absence of the necessary time in the curriculum. In connection with the expansion of the boundaries of professional and universal communication, we can also talk about the need to strengthen training in foreign languages. These examples are not exhaustive, but rather serve as an illustrative series for a summary of the need to expand the format for obtaining knowledge, skills,

and abilities by students in order to successfully build a managerial career in the future.

The problems of formation and development of the personnel potential of libraries are of particular importance in connection with the ongoing changes in the socio-communicative and economic situations the informatization of various production and management structures, the diversification of information needs, the commercialization of activities. Additional professional education, which organically fits into the system of continuing education of a library specialist, is designed to quickly transform managerial and technological innovations into a system of professional training.

According to the provisions of the professional standard for specialists in library and information activities, the main functions of librarians include: library and information services, holding cultural and educational events, maintaining websites/portals, network social services, organizing and working with the fund of rare and valuable books, etc. The implementation of almost every function involves the use of digital technologies, that is, today this also includes virtual and augmented reality.

Analyzing the various functions of augmented reality applications that stimulate the development of a future specialist in the field of library and information activities, we conclude that most of them correspond to the work of a librarian and the directions of the development strategy of librarianship in Ukraine and the world.

However, as practice shows, there are difficulties in implementing the identified potential features and functions of applications of AR for their practical application in the training of future library professionals (Hickerson, Lippinkot, and Crema, 2022; Wojcik, 2015). A objective need for a higher school teacher to change the entire methodological system of education arises.

Indeed, thinking over the system of training tasks based on AR and VR applications in the preparation of specialists for modern library and information activities should include the stage of understanding and choosing digital resources that best correspond to the work functions that are part of their professional standard and the directions

of the development strategy of library science in Ukraine.

It is required to perform a set of works on organizing the “augmented” space of the library (book fund, exhibitions, etc.), orienting its content both for the purposes of education and for the specific features of future professional activity.

The “augmented” educational environment should not only contribute to the achievement of the priorities of the strategy for the development of librarianship in Ukraine, but also be personally oriented and take into account the needs of librarians themselves, library visitors and consumers of their services.

As an example from the practice of EU universities, we can cite the technical support for an exhibition of history books in faces. For three-dimensional models, creating “augmented reality”, the capabilities of Quiver and SketchAR were used. In the virtual world in the pictures of Quiver, a dinosaur was waving its tail, and an alien was descending towards the taking off spaceship. Various masks of kings and generals were created using SketchAR, which visitors tried on and photographed (Goulding, 2017).

In addition, it should be noted that at present the library has ceased to exist as the only source of information services. With the advent of digital technologies, the user has the opportunity to choose the sources of information, so library institutions need to pay special attention to the quality and methods of providing information services. Libraries are faced with the task of reaching a new level of relationships with the user and expanding partnerships – they should think on the “customer journey”, just like any business companies do. The versatility of marketing activities in this case is not in doubt. The development of marketing theory (from the production concept to interaction marketing, or relationship marketing) is also reflected in the library field.

One of the modern concepts nonmarketing combines all the developments in this area, rethought ideas of building relationships. This is a technology for the development of ideas from scratch to their perfection, the concept of intelligent marketing, alternative names for which are pro-marketing (professional marketing), post-marketing (post-industrial marketing).

The need to implement effective solutions and practices has led to the spread of marketing thinking beyond the commercial sphere. So, in the library industry, this is the need to update the mechanisms of relationship marketing and achieve the maximum social effect. At the same time, the rational use of the resource potential of a library institution is mandatory, including on the basis of split testing, which allows evaluating changes in content.

The marketing approach to the activities of the library involves understanding the relationship of three components: users, staff, information resources (Hickerson, Lippinkot, and Crema, 2022). The library needs to develop a clear service strategy that builds on the institution’s resources and systems while maintaining consistency and a high level of service.

Thus, the “portrait” of a modern library and information specialist is very multifaceted and requires a complex set of both hard skills and soft skills. Accordingly, it is also necessary to provide information and technical support for the educational process within the framework of library and information specialties.

Due to the peculiarities of the forms of ownership of libraries, in contrast to the “classical” business sector, the use of well-established public-private partnership mechanisms for universities providing training in library and information specialties is hardly possible in this case, PPP requires modification of standard approaches. In this regard, the task of substantiating the economic efficiency of all elements of the state policy strategy for reforming higher library and information education is of the highest relevance.

Continuation of the best traditions of the past on a new technological foundation and with new semantic content largely determines the modern directions of modernization of the library industry and serves as the key to successful and sustainable movement of libraries along the path of modernization changes. In line with this path, higher library and information education should also follow, and sometimes even being ahead, given the exceptionally high rate of knowledge obsolescence observed today.

## CONCLUSION

Recently, a trend has become clearly noticeable, according to which the emphasis in the study of the innovation problem has shifted from the economic sphere to the socio-cultural, educational, and scientific ones. It is generally accepted that innovation is irresistibly becoming a vital factor in success, and therefore it is no longer considered “strange” to believe that namely innovation of all kinds will be the answer to the challenges of the coming century. They will transform the face of civilization, give it a chance for further development, which will result in the formation of an integral, humanistic-noospheric civilization.

This understanding is one of the many reasons for the attention of experts to the issue of innovation in the library field. Another reason is the need to bring the industry out of a crisis, or rather, a depressive state. In this case, Gerhard Mensch’s well-known motto “Innovation overcomes depression” gives the library sector a real chance to take its rightful place among the socio-cultural phenomena that ensure the development of modern society.

Accordingly, the formation of an information society and a knowledge society, changes in the social functions of libraries at the current stage, and the introduction of the latest information technologies encourage reviewing the requirements for the library industry in general and the training of future library and information personnel capable of navigating the multidimensional information space, in particular. In the conditions of informatization of education, moreover, the requirements for the formation of information culture of students are increased. Libraries are rapidly implementing the latest information technologies in all areas of activity, the computer park is growing, software is being modernized, the environment and needs of users are changing, their requests are diversifying, etc. Thus, not only the field for which specialists are trained is transformed, but also the nature of knowledge and professional behavior of librarians. Therefore, the topic of analysis and constructive reformation of modern library education is not only relevant, but professionally motivated in view of the urgent need to train high-quality personnel in the library and information industry.

In the last decade, there has been a transformation of the instrumental, that is, technological, model of the modernization of librarianship into a conceptual one focused on the implementation of the new socio-cultural mission of libraries in the knowledge-based information society. This new conceptual model for the modernization of Ukrainian libraries determined the main vectors of innovative changes in librarianship, characteristic of the current stage of development of the industry, filled them with new meaning and content. Accordingly, this requires a systematic scientific approach to the development of a state policy for reforming higher library and information education, and an assessment of the economic efficiency of this policy, based on an output-oriented program and taking into account the exogenous features of the environment.

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