Strategy of the Scientific Educational Libraries of Ukraine Network Digitalization

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Abstract. The article gives characteristics of the current state of the Ukrainian scientific educational libraries network's digital resources, presenting the results of the websites' content analysis. It determines the features of the full-text resources' thematic and type-specific structure of the leading sectorial electronic libraries as well clarifies the factors reducing the digitalization efficiency of the educational libraries of Ukraine network, develops a corporate cooperation strategy as to formation of consolidated and conveniently structured pedagogical science and education digital resource, equipped with convenient search services.

Keywords: digitalization, libraries, institutions, digital library, information resources, information services.

1 Introduction

A digital education introduction is one of the most important conditions for the "Concept for the Development of the Digital Economy and Society of Ukraine for 2018–2020" implementation. Digital education is the combination of various components and the most modern technologies using digital platforms, introducing new information and educational technologies, and applying progressive forms of organization of the educational process and active teaching methods, as well as modern teaching materials [1]. The task of creating profound educational resources located on specialized digital platforms with support for interactive and multimedia content for educational process participants' general access cannot be accomplished without the partic-

ipation of educational libraries' network, being qualified communication intermediaries in the "educational information resources – users" system.

A profound and comfortable information and communication space of the educational libraries of Ukraine network is the most important condition for increasing the level of the citizens' education to ensure the sustainable development of our country and its European choice. The educational libraries network is the largest one and unites 18,066 libraries of the Ministry of Education and Science of Ukraine (with about 15,000 libraries being of general educational institutions) and the National Academy of Pedagogical Sciences of Ukraine. The library network's single distributed fund is about 333.2 million copies. However, the mastering level of the latest information and computer technologies, online resources and services by educational libraries leaves much to be desired. It significantly reduces their attractiveness for the modern user. This necessitates the strategy's development for accelerated digitalization of the educational libraries in Ukraine network.

2   Related Works

Theoretical, methodological and organizational foundations for the integration of digital information resources in the field of education were developed by O. Onishchenko and L. Dubrovina [2], A. Peleschyshyn, R.Korzh, O. Trach, M. Tsiutsiura [3-7] Yu. Artemov, N. Varaksina and P. Rohova, I. Lobanovska and others. The results of the research of O. Honcharenko and I. Khemchan, devoted to organizational problems of introducing corporate interaction of educational libraries of Ukraine, are very timely. Yu. Artemov and P. Rohova, N. Varaksina, O. Isaienko, K. Karamysheva, L. Savenkova studied the quality's monitoring of online services for leading categories of users and the state of their satisfaction with the distant services of the main industry library. The work of R. Korzh, A. Peleschyshyn, Z. Holub [8-11] was important for mastering the features of introducing web-technologies for representing educational resources in a distant mode. Nevertheless, despite a sufficient number of specialist publications, the problem of the imbalance between the highly qualified teachers' expectations as to a system of high-quality distant library and information resources and services, as well as the imperfection of its formation in the context of the digital communication space deployment remains unresolved.

3   Methodology

The emphasis on information services for scientific libraries' users is currently shifting to the provision of personalized distant services based on web technologies, resources and services. Thus, foreign experience indicates that the most popular form of service among scientific libraries' users is the electronic full-text publications subscription, which operates based on cloud services. Among services, highly demanded by scientific libraries' users, are those based on the analytical processing of the authoritative Web of Science Core Collection (USA) and Scopus (Netherlands) scien-

tometric databases content, as well as the introduction of electronic models for the selective dissemination of information for scientific teams and individual scientists.

The principle of corporate cooperation is the most important in solving the problems of efficient aggregation and representation of digital library and information resources in the global communication space. It provides the unification of efforts and the allocation of responsibilities for the aggregation of a single industry communication space of all libraries, participating in the organization of effective network interaction.

4   Our approach

In 2019 the State Scientific and Pedagogical Library of Ukraine named after V. O. Sukhomlinsky conducted the "Scientific and methodological foundations of the development of educational libraries as an important component of the educational environment" research [12]. According to its results, it was found out that of 56 libraries that participated in the research only 27 generate Internet resources. The libraries of pedagogical universities (14) and regional institutes of postgraduate pedagogical education (6) are the most active and productive among them. In its turn, the sectorial scientific libraries of the National Academy of Pedagogical Sciences of Ukraine's institutions have the worst state with their own databases aggregation and their presentation in the network communication space.

The typological content features testify that the majority of scientific and pedagogical libraries of the country underestimate the importance of the full-text Internet resources aggregation. Thus, virtual exhibitions (148 units, which is 66% of the total volume of Internet content produced) are the first among 224 electronic library information products. Thematic presentations of libraries (30 titles (13%), with only 2 being multimedia and 1 – a video presentation) take second place. According to terms of titles, the third place goes to bibliographic resources (14 titles (6.3%)), out of which there prevail bibliographic indexes of the personalities from the series in "Outstanding educators" (9 titles), indexes of new revenues to the library fund (3 titles), and recommendation indexes (2 titles). It is worth noting that only 6 libraries present online Internet directories, among which 1 is an image catalogue, another 1 is a summary catalogue. This is not enough as part of the strategic tasks for the digitization and the openness of the educational and pedagogical field scientific space.

Full-text Internet resources make up only 6% of the total number of titles, of which only 5 are repositories, 2 – digital archives of the universities' academic editions, 1 – digital archive of library editions, 3 – database of valuable and rare publications of pedagogical issues, 2 – database of specialized periodicals, 1 – database of theses defended in the institution. The library of Sumy State Pedagogical University named after A. S. Makarenko precedes by the number of aggregated full-text DBs (5 DB). Unfortunately, only the library Website of Vinnytsia State Pedagogical University named after M. Kotsyubynskyi presents an innovative "Web Inclusion" project, providing audio versions of the library site's individual pages, as well as fairy tales and world class audiophiles for the visually impaired people. No less relevant is the

library of Ternopil National Pedagogical University named after V. Hnatiuk's web-product – the "University Teachers' Profiles in Scientometric Databases" DB. These best practices should be borrowed and distributed to all educational libraries of Ukraine, which will help to improve the library's quality and comfort, as well as information services for the members of the pedagogical field.

The key link in the scientific educational libraries network is the libraries of higher pedagogical education institutions of the Ministry of Education and Science of Ukraine and sectorial scientific libraries of the National Academy of Pedagogical Sciences of Ukraine institutions. The most powerful sectorial scientific and educational information resources in the field of pedagogy are formed by six scientific libraries of the national pedagogical universities of Ukraine; libraries of 31 higher III–IV accreditation level education institutions, preparing specialists in the field of pedagogy.

However, according to the content analysis of their Internet resources and services, the online component of their information infrastructure is only at the initial stage of formation. Thus, the websites content of most educational libraries does not even provide electronic catalogues and links to the full-text electronic resources of the basic methodological center – State Scientific and Pedagogical Library of Ukraine and the Electronic Library of the National Academy of Pedagogical Sciences of Ukraine. Produced by 48 leading educational libraries during the year, the typological composition of electronic resources leaves much to be desired:

- only 12% of them have developed new institutional repositories' collections (2 libraries);
- the website placement of the new issues of the institution's scientific professional editions (3 libraries);
- creation of thematic databases of the "Outstanding teachers of the region" series (2 libraries);
- adding to the "Proceedings of the scientists of the institution" database (2 libraries);
- electronic "Calendar of significant and memorable dates" (1 library).

The other 88% of all online resources of the scientific education libraries are virtual themed exhibitions.

According to the Web Metrics of Ukrainian Repositories, [13] the pedagogical higher educational institutions' ranking of 64 most popular digital storages has pointed out electronic archives of five universities. Rating of electronic archives by functional indicators:
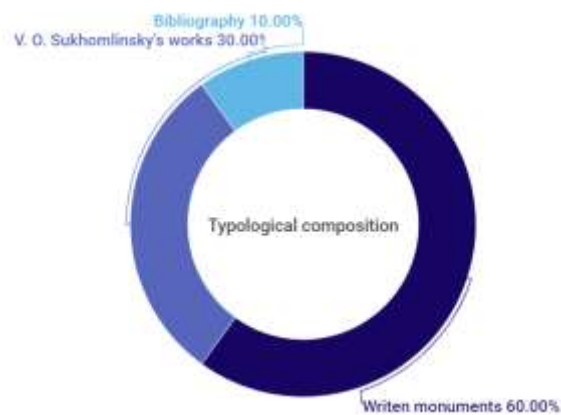
- 1 place - National Pedagogical University named after M. P. Drahomanov;
- 2 place - Ternopil National Pedagogical University named after V. Hnatiuk;
- 3 place - Poltava National Pedagogical University named after V. H. Korolenko;
- 4 place - Ukrainian Engineering and Pedagogical Academy;
- 5 place - Vinnitsa State Pedagogical University.

It is important to note that Ternopil was the only repository among regional communal institutions of postgraduate teacher education, been included to this authoritative rating. Its full-text electronic archive is structured very thoughtfully and efficiently. The electronic archives of other pedagogical universities (Sumy, Kryvyi Rih, Kirovohrad, Zhytomyr, Uman, etc.) still require a significantly substantive and structural improvement in order to increase the openness of resources and their citation.

The need of creating a unified information space for educational libraries envisages the activation of working out an integrated electronic sectorial information resource and providing free and multi-aspect distant access to it. In these circumstances, it is unacceptable to slow paces of filling the repositories of most scientific libraries of national pedagogical universities, which have the highest scientific and creative potential in the field, generate powerful flows of scientific and educational-methodological documentation, which is essential for improving the quality of higher pedagogical education and science in Ukraine. Prompt and high-quality update of the digital archives content of all domestic pedagogical educational institutions is the key to their fullest publication of research results aimed at improving scientific, pedagogical and educational activities in Ukraine and the world.

Sectoral Internet resources of the Scientific and Pedagogical Electronic Library of the State Scientific and Pedagogical Library of Ukraine named after V. O. Sukhomlinsky and the Electronic Library of the National Academy of Pedagogical Sciences of Ukraine are powerful in volume and valuable in content.

However, their content cannot be considered as perfect one. The electronic fund of V. O. Sukhomlinsky State Scientific Pedagogical Electronic Library of Ukraine, as the aggregator of the only distributed information resource in the field of pedagogy, is measured now with only two thousand storage units, with 60% of them being digitized books, 10% is made up of V. O. Sukhomlinsky's works and literature about him, and the rest is electronic bibliographic editions of educational network libraries (Fig. 1).

Fig. 1. Typological composition of the Electronic Library of the State Scientific and Pedagogical Library of Ukraine named after V.O. Sukhomlinsky

It is important that the library is trying to provide access to integrated sectorial information resources (ISIR) through the formation and maintenance of such consolidated bibliographic databases as:

- "Consolidated database of dissertations on education, pedagogy and psychology";
- "Consolidated database of collections of scientific papers on education, pedagogy and psychology";
- "Consolidated database of periodicals";
- as well providing distant users with various information services based on principles of cooperation, including inter-library loan (ILL), electronic document delivery (EDD), virtual bibliographic information;
- etc.

The cooperation of the State Scientific and Pedagogical Library of Ukraine named after V.O. Sukhomlinsky with the leading educational libraries forms an industry segment within the "Ukrainika naukova" nationwide abstract database and the "Dzherelo" Ukrainian reference journal. Nevertheless, while developing the system of library and information support for the educational industry, it should be taken into account that there are rapidly growing users' needs for unhindered distant access to integrated full-text specialized databases; thus, the typological composition of the full-text digital resources of the library should quickly diversify themselves.

The typological composition and the rate of the Electronic Library (EL) of the National Pedagogical Academy of Sciences of Ukraine [14] resources' replenishment, comprising the full-text electronic resources of the academic research institutions, cannot be considered satisfactory either. Among the factors hindering the process of the electronic libraries aggregation there are the low level of corporate interaction between project participants, the poor material and technical equipment, and staffing of the most academic institutes libraries.

A multifactorial comparative websites analysis of the National Pedagogical Academy of Sciences' research institutions made it possible to conclude them been created with an inconsistent structure:
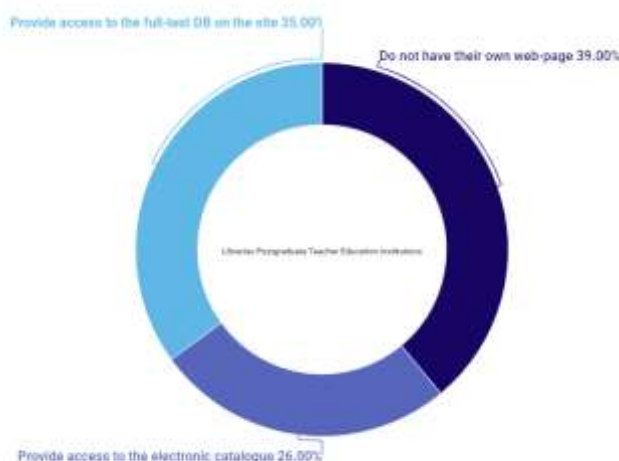
- not every site has library web-pages;
- basically access to the library information resources and services system is offered not from a single access point, but from various sections located at different levels of the institution's site.

From a remote user's point view, the significant disadvantages of the studied web-pages are:

- availability in a secure mode (only for the institution employees);
- location at deep structural levels of the site, which makes it difficult to find information;
- spraying information about library resources in various sections and levels of the site;
- sophisticated methodology for the search query formulation for certain types of documents with a specific issue.

5 Results

According to the results of a content analysis of 26 Ukrainian central and regional institutions of postgraduate teacher education sites, it was found that in the in the context of its radical reform, the libraries' scale and pace of aggregation as to the full-text online resources of the regional postgraduate teacher education institutes is very insufficient. Hence, the libraries of 10 (39%) continuing teacher education institutions do not have their own web-page at all; 16 institutions' libraries have a separate web-page, with only 7 (26%) offering their users remote access to the electronic catalogue, 9 (35%) libraries offering access to full-text databases of scientific collections, research and scientific-methodological works of the institutes' employees, and graduate qualification papers repositories of the continuing education courses students (Fig. 2).
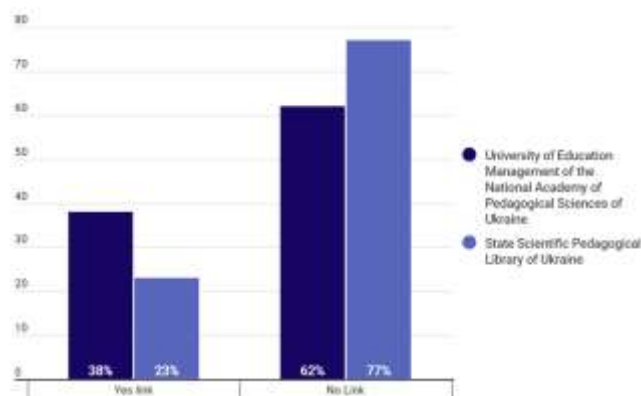

Fig. 2. The state of distant services of libraries of the postgraduate teacher education institutions in Ukraine

An illustrative example for studying and borrowing is the experience of the scientific and methodical library of Chernihiv Regional Institute of Postgraduate Pedagogical Education named after K. D. Ushinsky. Its staff joined forces with the specialists of the Department of Information and Computer Technologies in Education and created a specialized educational portal with a virtual space for developing professional competence of the institute's employees and students. In addition to links to the electronic library resources of the Institute for the Modernization of Education of the National Academy of Pedagogical Sciences of Ukraine, the new portal also has useful links to thematic blogs of social networks, innovative online trainings for teachers, etc.

The information support quality for the postgraduate teacher education learners has slightly been improved due to the University of Education Management scientific library website's links to the Electronic Library resources of the Academy of Peda-

gogical Sciences of Ukraine. Its content includes 380 publications (both professional periodicals and the conference abstracts) of the Central Institute of Postgraduate Education employees. However, the general situation with the actual content of the most postgraduate teacher education institutions libraries' websites indicates the need for consistent and purposeful implementation of the coordination and cooperation principles in organizing their productive interaction.

Fig. 3. The number of institutions that contain links

Since only 10 out of 26 institutions contain links to the corporate electronic resource of the University of Education Management of the National Academy of Pedagogical Sciences of Ukraine, only 6 libraries of the postgraduate teacher education institutions provide links to the electronic library resources of the State Scientific Pedagogical Library of Ukraine named after V. O. Sukhomlinsky. The State Scientific Pedagogical Library of Ukraine named after V. O. Sukhomlinsky aggregates a powerful complex of full-text consolidated documents: dissertations on education, pedagogy and psychology; specialized collections of scientific papers and periodicals; bibliographic editions of educational libraries. Being a sectoral scientific and methodological centre, this very library should contribute to improving the websites content's quality and richness of all types of the country's educational libraries, including libraries of postgraduate teacher education institutions.

Among its primary tasks is the pedagogical library's typical site structure development, the mandatory component of which should be:

- an electronic catalogue and full-text databases;
- a problem-thematic navigator as a hyperlinks system to specialized Internet resources of domestic and foreign database aggregators;
- the development of a well-thought-out rubrication of the institutional repository's full-text content according to the archived document types;
- obligatory inclusion of the postgraduate teacher education system students' qualification papers.

With V. O. Sukhomlinsky State Scientific Pedagogical Library of Ukraine being the basis, it is also very necessary to organize systematic measures on improving the educational library workers' skills, to distribute responsibilities between them for the aggregation of a single corporate full-text Internet sectorial resource.

6   Conclusions and Future Works

In accordance with the requirements of the society's innovative development and the knowledge economy's development, it is imperative to ensure the education sector digitalization to be ahead of the curve. Implementation of high quality digital education will be facilitated by powerful and meaningful online library resources and online services, with its creation on the basis of all educational libraries efforts' cooperation and coordination under the centralized organizational and methodological guidance of the State Scientific and Pedagogical Library of Ukraine being the priority of the sector's digitizing now.

Digitalization strategies for the educational libraries network should be based on consolidated digital resources and distant services. The evidence of this is the experience of foreign libraries, as they give priority to the latest trends. These are:

- corporate aggregation of powerful digital libraries;
- prioritization of mobile content and access to library resources through mobile technologies;
- improving the comfort of online library services (easy navigation on the site, profound content and effective management tools knowledge);
- expanding the communication space of scientists through links to professional communication resources – specialized networks, forums, blogs;
- based on the library space, development of active learning and experience exchange zones, production studios, and maker spaces, not only contributing to the productivity of teachers' acquisition of innovations, but also providing conditions for the creativity and communication development, as well as the ability to work in a team in them.

A high level of digital technologies mastery requires the library staff to have creative skills for effective work in online applications and services, social networks and web portals, creative presentation of information, its qualified collection, processing, ordering, storage, analysis and extraction of knowledge. Working with large amounts of digital information requires a high level of emotional intelligence, the ability to concentrate and manage attention, flexibility, adaptability, stress resistance, the ability to quickly retrain, adjust to continuous development and improvement.

In the context of the European integration, the system of library and information services of the Ukrainian educational sector should be developed on the basis of careful study and the best foreign experience implementation aimed at diversifying the assortment and increasing the comfort of remote library resources and services.

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