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Institutional Repositories as a Global Dissemination Tool of Educational and Scientific Information Referentiel institutionnel comme outil de diffusion de l'information éducative et scientifique dans l'espace mondial Repositorio Institucional Como Herramienta De Difusión De Información Educativa Y Científica En El Espacio Mundial

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Article abstract

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Institutional Repositories as a Global Dissemination Tool of Educational and Scientific Information

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Abstract

The authors present an overview of publications on the introduction and use of digital institutional repositories (DIR) in different countries and in Ukraine. A variety of reference and scientific literature, and publications in international scientometric databases have been analyzed. The role of digital institutional repositories in providing access to full-text electronic achievements, disseminating research results, and maximizing their accessibility and scientific influence is highlighted. The problem of creating and using digital institutional repositories in the training of specialists in higher education, as well as the formation of their information and research competence, is considered. It is substantiated that institutional repositories are a powerful tool in pedagogical universities to conduct and disseminate scientific research results in education, pedagogy, and psychology. Particular attention is paid to the role of library materials in the formation and operation of digital institutional repositories. The experience of Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University Library (Ukraine) is reflected separately.

Keywords: digital institutional repository, information and research competence, open electronic scientific and educational systems, open science; pedagogical university library

Editors' note: *Encounters* stands in solidarity with the Ukrainian people. We honour these and other authors who work under such difficult conditions.

Repositorio Institucional Como Herramienta De Difusión De Información Educativa Y Científica En El Espacio Mundial

Resumen

Los autores del artículo presentan una descripción general de las publicaciones sobre la implementación y el uso del repositorio institucional digital (RID) en diferentes países y en particular en Ucrania. Se analizan diversas publicaciones científicas y de referencia en bases de datos cuantitativas internacionales. Se destaca el papel del repositorio institucional al brindar acceso a los logros electrónicos en texto completo, la difusión de los resultados de la investigación y la maximización de su apertura e impacto científico. Se plantea el problema de crear y utilizar un repositorio institucional en la formación de especialistas en educación superior, la formación de su competencia informativa e investigadora. Se sustenta que el repositorio institucional de la Universidad Pedagógica es una poderosa herramienta para la conducción y difusión de los resultados de la investigación científica en educación, pedagogía, psicología. Se presta especial atención al estudio de materiales sobre el papel de las bibliotecas en la formación del repositorio. La experiencia de la biblioteca de la Universidad Pedagógica Estatal de Vinnytsia que lleva el nombre de Mykhailo Kotsyubynsky se refleja por separado.

Palabras clave : ciencia abierta; sistemas educativos y científicos electrónicos abiertos; competencia de información e investigación, repositorio institucional, biblioteca universitaria pedagógica

Referentiel Institutionnel Comme Outil De Diffusion De L'information Éducative Et Scientifique Dans L'espace Mondial

Résumé

Les auteurs de l'article présentent un aperçu des publications sur la mise en œuvre et l'utilisation du référentiel institutionnel numérique (RIN) dans différents pays et en particulier en Ukraine. Un certain nombre de références et de littérature scientifique, des publications dans des bases de données quantitatives internationales sont analysées. Le rôle du référentiel institutionnel dans l'accès aux réalisations électroniques en texte intégral, la diffusion des résultats de la recherche, la maximisation de leur ouverture et de leur impact scientifique est souligné. Le problème de la création et de l'utilisation d'un référentiel institutionnel dans la formation des spécialistes de l'enseignement supérieur, la formation de leur compétence d'information et de recherche est posé. Il est prouvé que le référentiel institutionnel de l'Université pédagogique est un outil puissant pour conduire et diffuser les résultats de la recherche scientifique sur l'éducation, la pédagogie, la psychologie. Une attention particulière est portée à l'étude des matériaux sur le rôle des bibliothèques dans la constitution du

référentiel. L'expérience de la bibliothèque de l'Université pédagogique d'État de Vinnytsia du nom de Mykhailo Kotsyubynsky est reflétée séparément.

Mots-clés : science ouverte; systèmes scientifiques et éducatifs électroniques ouverts; compétence d'information et de recherche, référentiel institutionnel, bibliothèque universitaire pédagogique

Introduction

Contemporaneity requires researchers to use and cite current scientific research. The World Wide Web makes it possible to make research results open and accessible. Open electronic scientific and educational systems are a powerful auxiliary tool for conducting research and shaping scientists' information and research competence. Open access scientific databases provide free online copies of peer-reviewed journal articles, conference presentations, technical and scientific reports, research papers, teaching materials, lectures, multimedia materials, and more. The main criteria for the selection of such systems are openness, functionality, and their suitability for use in institutions of research and higher education (Spirin et al., 2020).

Digital institutional repositories (DIR) are a constructive model of an open access system, which plays an important role in the general processes related to the accumulation, storage, and transmission of information in space and time. A significant number of higher education institutions (HEIs) and research institutions implement the concept of open access to research results through the use of the so-called institutional repository model (Oleksiuk, 2012).

The current stage of development of science and education in Ukraine is characterized by the active creation and implementation of digital repositories and archives that have the potential to serve as real tools to improve the quality of university work. They demonstrate the scientific, social, and economic significance of research and thus increase scientists' status and social value. Open scientometric systems, systems of alternative metrics, and institutional repositories are used for collecting and processing statistical data on the results of individual and team-based research in scientific institutions. Ukrainian scientists have substantiated the feasibility of creating special Google Academy profiles to evaluate every research team's results, rank scientists by the number of citations they have within their respective research area, and judge the general or temporal scientific influence of their work based on institutional repository download data (Bykov et al., 2020).

Meanwhile, the main advantages of institutional repositories for an academic institution are greater visibility and integration into the scientific research landscape, which can potentially increase an academic institution's local and global rankings and citation index.

Definition of the Problem

A systematic literature review not only facilitated a better understanding of the role and importance of digital institutional repositories, but greatly helped determine further research directions. A careful search was conducted of publications in international scientometric databases to identify the literature that had been published on DIR-related topics. It was found that a lack of proper knowledge concerning open access issues among scientists and research institutions along with the insufficiently developed ICT infrastructure may cause serious problems in the development of open access institutional repositories.

Digital institutional repositories around the world are at a critical juncture. Barriers are multifaceted and come from a variety of stakeholders, such as organizations, funding bodies, publishers, users, academics, administrators, and public policy. The problems identified through the review of available literature mainly consist of three components: technical (hardware, software, and open standards), non-technical (administrative and political issues), and cultural (social acceptance, popularization, and promotion, etc.) (Roy, 2021).

The analysis shows that the topic of how DIR can be used for effective learning and research is insufficiently covered. The functional advantages of electronic archives (open free access, automatic structuring, convenience, usability, etc.) create a favorable scientific communication environment. There are certain shortcomings in DIR functionality that need further correction to ensure educational services that will better promote self-development, self-education, and the acquisition of relevant competencies among higher education students. (Rymar et al., 2020).

Despite the rapid growth of research in this area, much remains to be done to systematically review and integrate the results of previous research, to examine the current state of DIR research, and to further disseminate information on the importance of every library and higher education institution using DIR to disseminate the results of individual and institutional educational and research activities.

Most research in this area has focused on the organization, implementation, benefits, and challenges of DIR. Our own research and a review of the literature on the formation and use of DIR indicate a lack of knowledge among scientists and institutions concerning open access. Insufficient information and communication technology infrastructure is a serious problem in developing DIR for open access. Meanwhile, improving academic institutions' visibility, raising local and global rankings, increasing prestige and social value, and improving the teaching, learning, and research activities of an institution's scientists have been recognized as the main DIR's advantages.

Data from OpenDOAR, the Register of Open Access Repositories (ROAR), and the World Repository Rating Network (RWWR) are used to analyze accessibility and general visibility of data. Researchers suggest that repositories wishing to be listed in the RWWR must have some degree of visibility and incorporate best practices in their web publications to meet the quantitative requirements of RWWR webometrics, such as visibility, size, rich files, and "scientificity" (Lee-Hwa, Abrizah, and Noorhidawati, 2013).

Our study of materials indicates that some of the leading world universities do not contribute to the active movement of open access. Only a small percentage of institutional repositories are visible and include best practices in their web publications, which affects the quantitative webometrics indicators used in the RWWR ranking and included in the top 100 ranking of the Internet repository of global repositories. Research by some scholars has suggested that if the web performance of an institutional repository is lower than expected, university authorities should review their web policy to increase the volume and quality of research publications in their DIR.

In addition to a number of problems related to publishers' requirements and copyright harmonization, the following are highlighted: lack of researchers' motivation to archive their already published work; institutional repositories offering the same set of services as electronic libraries; publishers having citation tracking (analysis) services (e.g., Crossref, Web of Knowledge, Scopus) and repositories not having them; and authors' inclination to download a "journal" version of an article (peer-reviewed, edited, paginated, etc.) or only the original manuscript. There are also a number of questions related to a publication's volume and quality, services for authors or users, design, usability, reliability, preservation, and so on.

Problems associated with the creation and functionality of DIRs is important for both scientists and librarians. Nowadays, informatization and educational reform, the formation of electronic resources, popularization of open access ideas, construction of scientific information public archives, and increasing webometric ratings are important tasks of the university library. Libraries, as the main link in the public information infrastructure, have an important mission to promote open access as a way of disseminating knowledge for the development of science and education, which is impossible without maximum access to knowledge and information. One of the important directions of university library development is research into the organization of institutional repositories. Libraries actively implement new information and communication technologies, participate in the organization and support of their repositories, and promote the benefits of open access to scientific information. Importantly, a significant role in the process of strengthening open access positions, particularly in the creation and maintenance of repositories, now is performed by university libraries, which are beginning to play a new publishing role (Yaroshenko, 2011).

Literature Review

Though the problems and benefits of creating open access have long been studied by domestic and foreign scientists, the issue still remains relevant today. The share of research published in open access journals or available on other open access platforms has increased over the past two decades, mainly due to funding, institutional policies, grassroots advocacy, and changing attitudes in the research community. However, the relative effectiveness of these various intrusions remains largely unexplored (Huang et al. 2020).

The problems of modern scientific communication system development, the functioning of open access archives, the creation and purpose of DIR, and the use of electronic documents are studied by foreign (see Lee-Hwa, Abrizah & Noorhidawati 2013, Buehler and Boateng 2005, Boulton 2020, Horwood et al. 2004, Huang et al. 2020, Roy 2021, Demetres, Delgado & Wright 2020, Lynch 2003) and domestic higher education researchers (see Bykov et al., 2020; Kolomiets, Kolomiets & Gromov, 2017; Umanets, Shevchenko & Bezugly, 2020; Perederii & Voshchenko, 2016; Spirin & Oleksyuk, 2013; Yaroshenko, 2011; Bilous, Lazarenko & Kolomiets, 2017). Theoretical and practical aspects of open digital systems in university libraries are also studied by Ukrainian librarians (see Bruy, 2021; Bielinska & Moroz, 2013; Bilous, 2013; Oleksiuk & Oleksiuk, 2012; Perederii, 2016; Rymar et al., 2020; Spirin et al., 2020).

Issues surrounding unlimited and free access to scientific publications, as well as the creation of an open access repository, are explored by scholars and practitioners of the documentary, information, and library spheres. A number of publications by researchers dealing with DIR matters identify the important role of libraries in DIR implementation projects. Many works are devoted to this problem. This topic is considered at scientific conferences and seminars and in professional journals by domestic and international scientists, educational practitioners, and professional librarians. As a result, studies focusing on DIR implementation issues and, in particular, its impact on the role of reference librarians, have not been as prominent as expected (Buehler and Boateng 2005, 291–300).

Australian scholars discussed the role of librarians in developing and promoting DIR, identifying the skills needed by librarians, and the pitfalls and challenges they may face in convincing teachers of institutional repositories' benefits (Horwood et al., 2004).

In general, the literature review has shown that there is only limited discussion of the librarian's role, especially in dealing with self-archiving authors, which is a key characteristic of DIR (Allard, Thura, & Feltner-Reichert, 2005). Thus, the main message of S. Boulton's case study: libraries should engage with their clients in order to actively collaborate in creating opportunities for research exchange (Boulton, 2020).

Methodology

The object of this study is to define the principles of the formation and development of DIR as an effective tool for disseminating educational, methodological, and research activities. The authors systematically analyze official documents, documentary sources, and research publications, and observe and compare institutional experiences creating and operating digital repositories to host open access journals, books, conference proceedings, social network publications, international scientometric databases (e.g., Web of Science Core Collection, Scopus [Elsevier], and Library, Information Science & Abstracts [EBSCO]) in the field of pedagogy and library science. The scientific and methodological principles of developing DIR as an educational and scientific environment in the context of open science priorities are also determined.

Using scientific method, our research analyzes the principles of forming educational and scientific environments in the context of open science concepts, one of the main

aspects of which is the active use of DIR as an archive of scientific achievements. The institutional experiences are generalized. The authors present various thematic issues regarding the functioning of digital repositories and their importance and effectiveness.

Internal librarians used Google Analytics to systematically analyze activity on Vinnytsia State Pedagogical University's DIR, such as visits, document retrievals, downloads, etc., to determine the active use of the university's research resources located in the repository. The role, significance, and effectiveness of VSPU's institutional repository in research and development activities were determined through experimental methods, observation, questionnaires, in-depth interviews, and statistical analysis.

Results and Discussion

Analysis showed that the concepts found in the DIR literature can be grouped into five main topics: definition, implementation, management, results, and the role of librarians. The review indicates the great importance of determining the impact of institutional repositories on the academic institutions, thus justifying their implementation and support, and that most universities have adopted DIR as an option to increase their visibility, status, and relevance in the world of knowledge. We conclude from the review that DIR is now recognized as important infrastructure for educational institutions in the digital world.

For pedagogical universities, DIR is a powerful tool for conducting research on education, pedagogy, and psychology, enhancing important activities such as global integration and determining research demand through the number of applications and downloads. In general, DIR contributes to the university image as a center of education and science. The benefits to individual researchers of submitting publications to an institutional repository include rapid dissemination of scientific results, an increase in indexed citations, and the creation of new operative online publications on topical issues.

Numerous definitions of the terms "repository" and "institutional repository" can be found both in dictionaries and scientific publications. Having analyzed the definitions as institutional repository researchers, we can summarize that a "repository" itself is a place where data is stored and maintained in the form of files available for further storage on the network. But an "institutional repository" is an information system that has the potential to promote open access to scientific knowledge, increase the visibility of researchers' achievements, and to promote scientists' reputations.

Furthermore, institutional repositories are an important means of publishing, disseminating, and storing the digital information of educational and research organizations themselves. Most repositories run on open-source software. They are platforms for presenting and publishing scientific results not previously presented in digital format (Demetres, Delgado, & Wright 2020).

In Ukraine, the practical implementation of open access to information began in the second half of the 20th century, and therefore the organization of institutional repositories, and open access to them, in university libraries remains one of our country's urgent tasks. The first domestic institutions to introduce them were the

National University of Kyiv-Mohyla Academy and the Ukrainian Catholic University (Lviv). It is proven that the functional advantages of electronic archives (open free access, structured material, the convenience of accessing the information at any time, and the possibility to easily disseminate one's own research) promote scientific communication. Using DIR as an alternative model to introduce information and communication technologies, educational processes create favorable conditions for training promising future researchers. However, many Ukrainian higher education institutions today do not use digital repositories, so the internal process of forming, elaborating, and developing appropriate standards and technologies to adopt DIR is underway across the country.

It is clear that DIR is an effective form of communication in the educational and scientific environment, promoting the development of universities both in Ukraine and the world at large. Nationally, its main function is to encourage the information, scientific, and educational communities to actively cooperate towards the goal of free access to the information and scientific resources within universities, the leading academic institutions for transforming the role of science in the knowledge society. As a constructive model of open access to electronic resources, institutional repositories play an important role in the processes associated with the accumulation, storage, and transmission of information in space and time. In addition, the research data housed on institutional repositories serve as a real indicator of a university's effectiveness as an elite research and educational centre, demonstrating the scientific, social, and economic significance of research; hence their status as institutions of "higher" education and their social significance (Perederii & Voshchenko, 2016).

Researchers have objectively noted that in modern scientific circulation the institutional repository is considered "not only as a repository of electronic scientific materials of a particular institution or higher education institution, but also a service provided to its employees to store, accumulate, systematize and disseminate research results in digital format" (Spirin & Oleksiuk, 2013).

When properly collected and logically organized, DIR preserves the institution's intellectual product, increases the importance of departments and libraries that support it, and are an important component of scientific communication, which expands access to research, promotes the control of scientific knowledge with the academic community's help, increases competition by reducing the monopoly of scientific journals, conveys institutional prestige, and demonstrates the scientific, social, and economic significance of the research activities.

Thus, the effectiveness of DIR is simultaneously a factor and an indicator of an institution's competitiveness, both in the scientific field and in the educational services market. Note that effectiveness is obvious in several subjective dimensions. Such an electronic resource is useful primarily for scientists, as it increases the citation index of their work and ensures permanent storage for their documents and copyright compliance. An institutional repository plays an equally important role in the work of a research unit (for example, a university department or research laboratory), as it promotes the dissemination of information about the unit among the academic community, influences the citation level of its staff, and ensures long-term preservation

of data. For higher education institutions, the availability of such information resources is a factor in the general support of scientific activity, improving the quality of professional communications, increasing its rating, and ensuring open access to research (Perederii 2016).

DIR should be considered as a basis for building an institution's experience, enabling "dissemination of the university's scientific knowledge, increase of its scientists' citation ratings, avoidance of scientific knowledge duplication (ensuring the scientific process efficiency), increase of the scientific process transparency, as well as scientific knowledge exchange" (Bielinska & Moroz 2013, p. 23). It is also a functional element in the organization of the institution and its ability to enhance the effectiveness of training future professionals and their acquisition of research competence.

Providing teachers and graduates open access to educational and scientific materials is key to their integration into the higher educational institution scientific process, which enriches research results and dissemination, stimulates innovative investigations, and increases the effectiveness of scientific discoveries. Our research shows (Figure 1) the large number of published works downloaded from the open access platforms; therefore they are spread faster and more broadly throughout the scientific community. An institution's official website, being a kind of window to the world, is one of the most important means of promoting its activities and improving its competitive position.

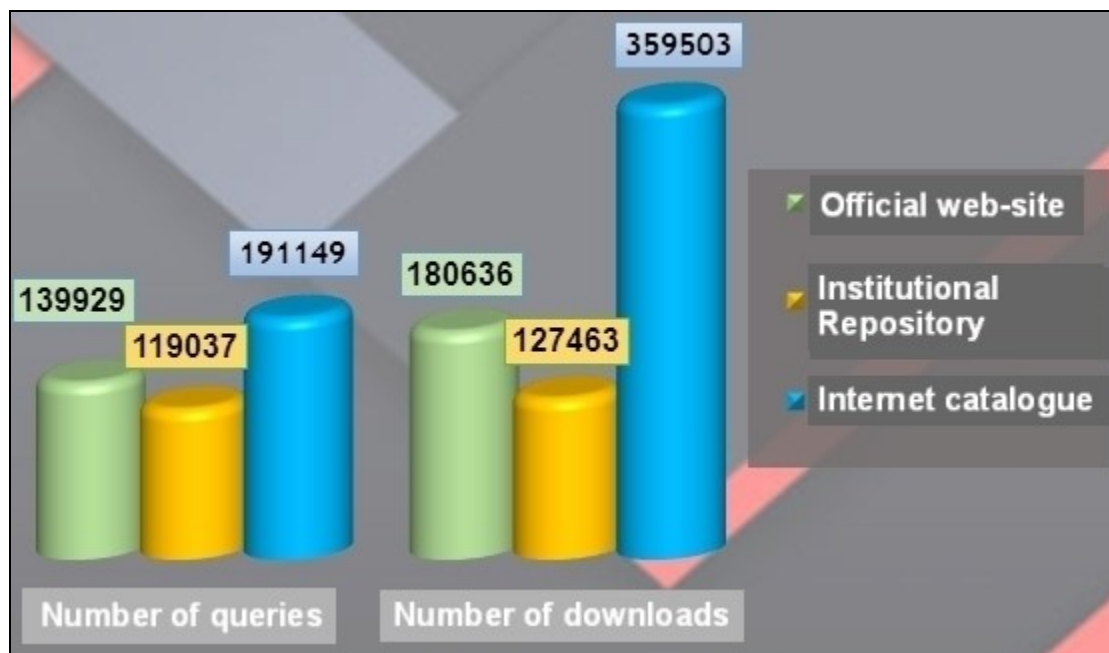


Figure 1. Main Internet resources of VSPU library (data for 2021)

As Internet technologies developed, the idea of providing prompt and free access to research results originated in both academic and library communities. However, librarians much earlier than researchers began to promote the initiative of organizing open access to information resources.

Using various methods, the Vinnytsia Mykhailo Kotsyubynsky State Pedagogical University Library promotes the latest educational standards, including open access resources. The library is an information base, which contains an organized stock of electronic documents generated according to defined parameters by means of appropriate software that allows creating, processing, using, and storing the data. An innovative Internet project carried out by the library, *Library 2.0*, made all the library's resources and services available for Internet users. The project allowed the library to quickly adapt to the teaching and research community's information needs during quarantine, securing the provision of central library services under difficult conditions. As a result of the project, the university library significantly strengthened its presence in the scientific segment of the World Wide Web.

Among the strategic priorities of Vinnytsia Mykhailo Kotsyubynsky State Pedagogical University are the following: forming a powerful electronic library; providing free and unrestricted access to information and expanding the range of secondary sources of research data; creating DIR functionality that fully meets the professional needs of its scientists and educational practitioners; promoting the effectiveness of its research in pedagogy, psychology, and teaching methods in certain disciplines; and highlighting the university's recent achievements in science, technology, and educational practices (Kolomiets & Gromov, 2017).

The library had taken responsibility for globally disseminating its teachers' and scientists research results, forming a significant array of Internet resources of various orientations through a single access window on its website.

Vinnytsia Mykhailo Kotsyubynsky State Pedagogical University's institutional repository, IrVSPU, (Figure 2) is linked to the library's official website (<https://dspace.vspu.edu.ua>) as a web-based cumulative and permanent database electronic full-text archive, which houses scientific, educational, and methodological works created by the university structural units' staff.

Departmental repositories for electronic versions of students' academic texts (course and diploma papers, reports, essays, etc.) are being actively formed right now on IrVSPU (Bilous, Lazarenko, & Kolomiets, 2017). Thus, the institutional repository promotes the formation of students' research skills across various academic activities: practical research tasks, individual work and projects, conferences and seminars, preparing and publishing scientific reports, and preparing and defending graduate theses.

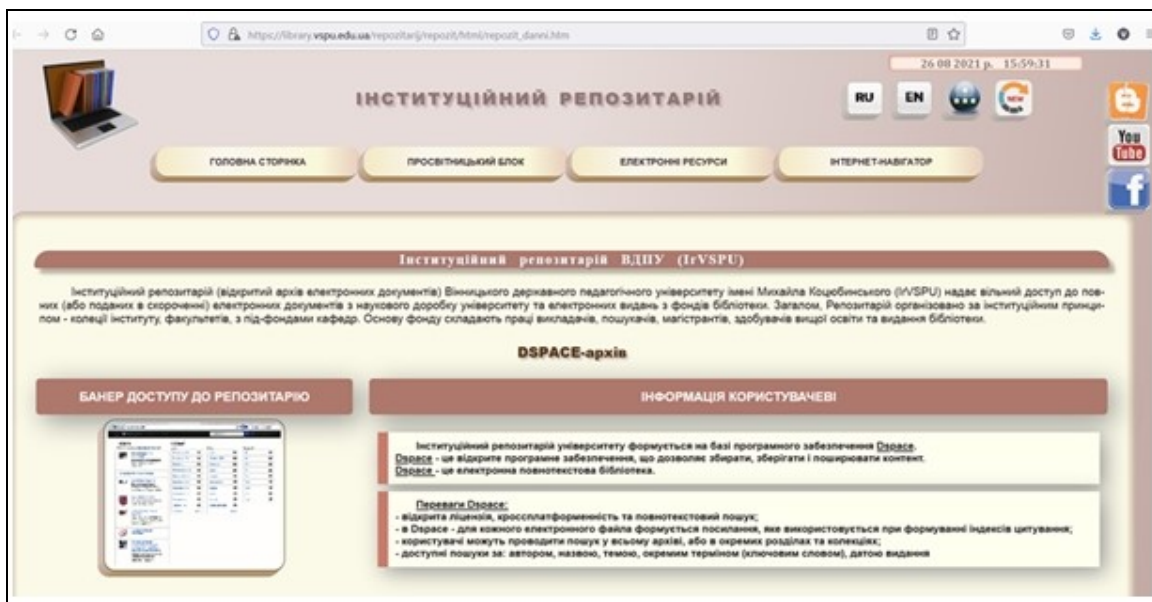


Figure 2. IrVSPU, the institutional repository of Vinnytsia Mykhailo Kotsyubynsky State Pedagogical University

IrVSPU is formed exclusively on the basis of Dspace open access software (Figure 3), developed by MIT, which supports the OAI-PMH data exchange protocol (Open Archives Initiative Protocol for Metadata Harvesting) and interacts with other metadata exchange systems of international registers such as OpenDOAR, ROAR, and others. In essence, Dspace is an electronic library, having open license, cross-platform and full-text search advantages. Its open-source software allows scientific content to be collected, stored, and distributed as well. IrVSPU's functionality is based on policies developed and approved by the University Academic Council's *Regulations on the Electronic Library*, *Regulations on the Electronic Library Catalog*, and *Regulations on the Institutional Repository (IrVSPU)*.

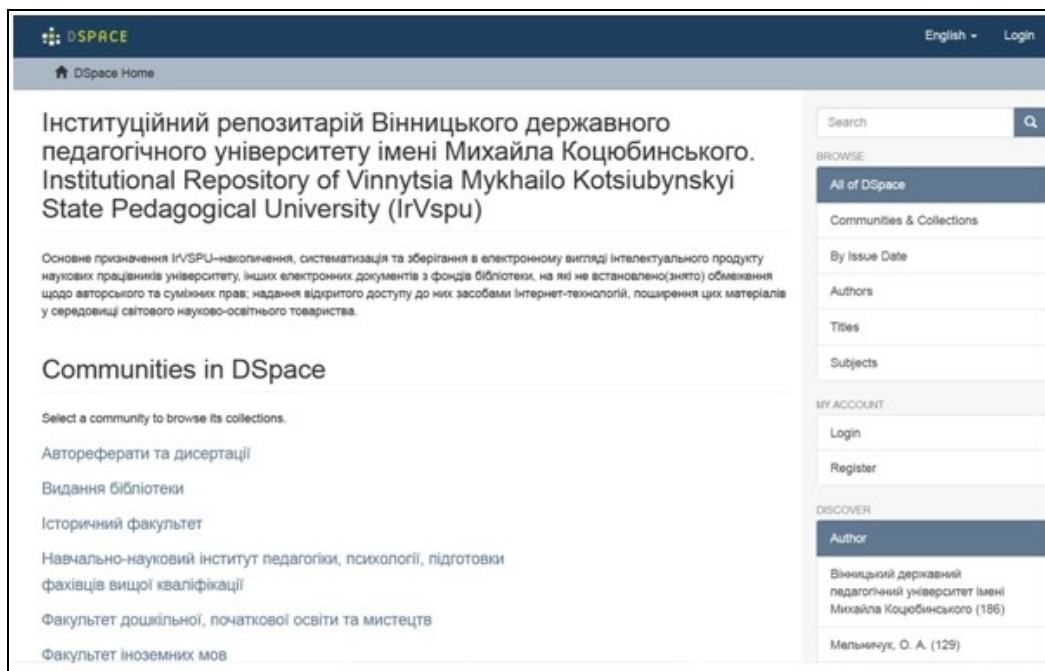


Figure 3. IrVSPU institutional repository on the DSpace platform

To raise the international scientific rating of the university, IrVSPU is registered in the International Directory of Repositories OpenDOAR (Figure 4) and the International Register of Institutional Repositories ROAR.

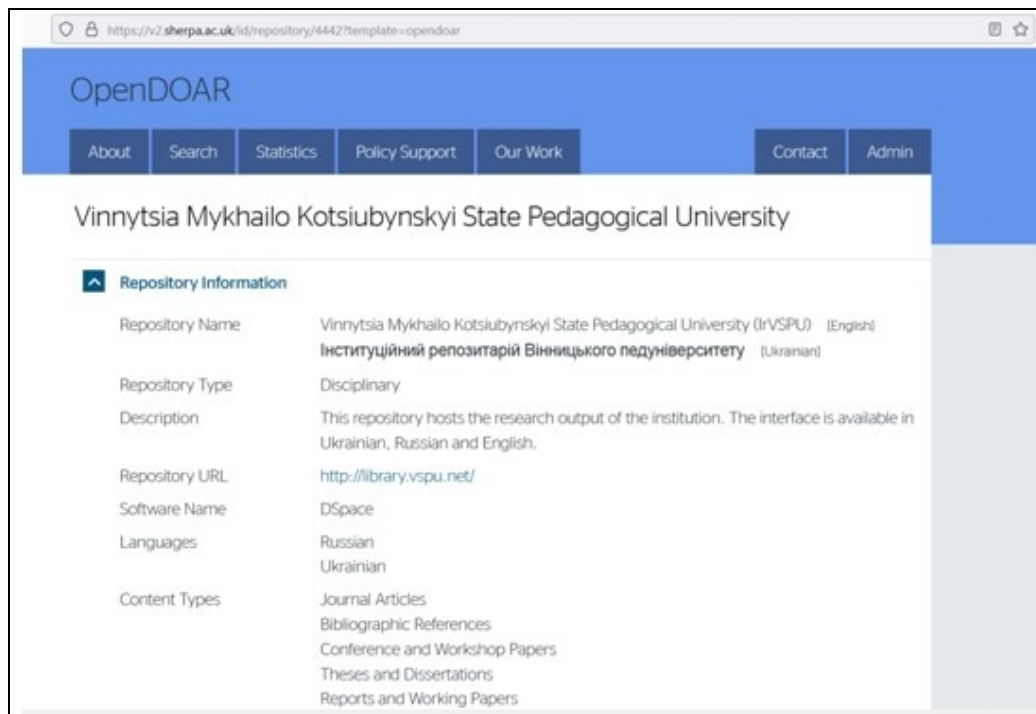


Figure 4. IrVSPU in international registers (OpenDOAR)

On ROARMAP, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University has one of the 105 Ukrainian higher education repositories. (Figure 5).

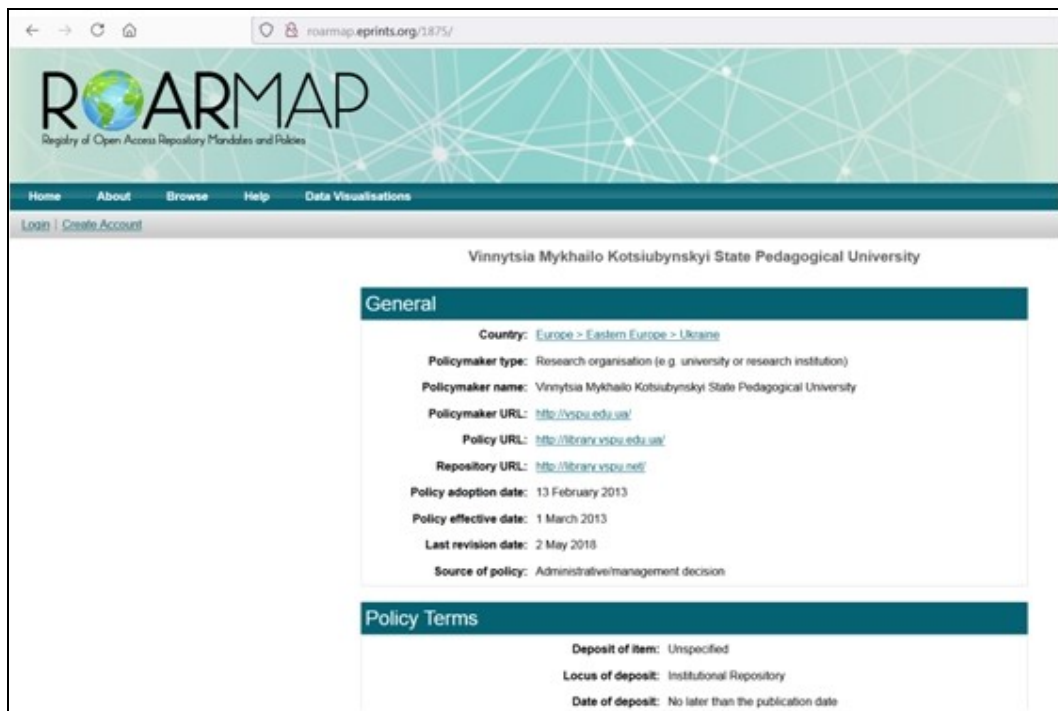


Figure 5. IrVSPU in international registers (ROARMAP)

Being aware of the fact that open access does not supersede copyright, the library staff regularly informs researchers about the transparent and understandable copyright system, including issues of enforcing copyright.

Authors exercise exclusive rights to their work by voluntarily submitting their publications to IrVSPU over the Internet. The University has the right to publish their scientific work on the Internet as a publisher. Legal relationships with authors are regulated by the *Agreement on The Transfer of Scientific And Educational Materials to The Digital Library*, which determines the degree of material protection (free use, limited use, read-only) and authors' consent to include materials in the relevant IrVSPU collection area. Student work is placed on IrVSPU after its authenticity has been certified.

The geographical reach of IrVSPU use is global. In 2021, in addition to almost 100,000 queries by Ukrainian scientists, IrVSPU documents were used by scientists from several other countries (Figure 6). The comparison was made on the number of queries.

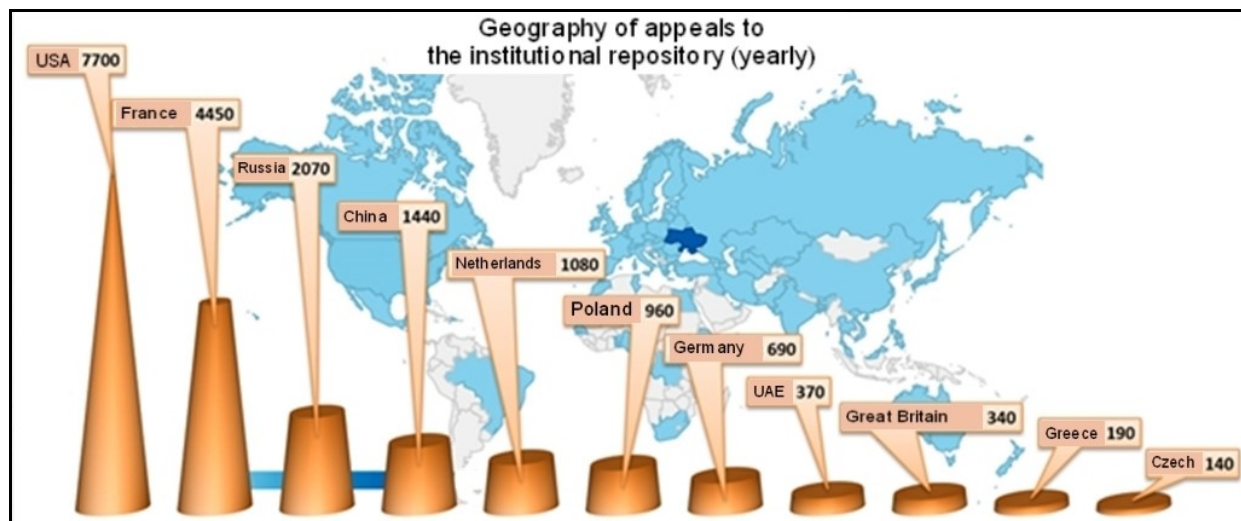


Figure 6. Geography of appeals to IrVSPU institutional repository

IrVSPU publications are actively used and cited by students, researchers, and teaching staff. Table 1 shows the top 10 most requested publications.

Table 1.

Rank	Name of publication	Total Downloads	Downloads in 2021
1	Kaplinisky V. 100 difficult situations in lessons and out of lessons - looking for a solution: textbook. Vinnytsia: Nilan Ltd., 2015. 80 p. https://dspace.vspu.edu.ua/handle/123456789/293	14719	5800
2	Lapshin S.A. Influence of mass media on formation of modern information society in Ukraine. Collection of materials of the round table Information resources and intellectual property in the educational and scientific space: legal and philosophical dimensions. Kyiv, 2017. P. 68–76. https://dspace.vspu.edu.ua/handle/123456789/2288	6863	1790
3	Galuzyak V.M., Kholkovskaya I.L. Diagnostic tools of the class teacher: textbook. Vinnytsia: Nilan Ltd., 2013. 304 p. https://dspace.vspu.edu.ua/bitstream/handle/123456789/1172/	6678	2003
4	Voevoda A.L. To be interested in mathematics: (methodical materials for increase of interest to mathematics): textbook. Vinnytsia: Legkun, 2012. 181p. https://dspace.vspu.edu.ua/handle/123456789/1	6094	2561
5	Matviychuk A. Ya., Stinyansky V.L. Electrical engineering: textbook. Vinnytsia, 2017. 270 p. https://dspace.vspu.edu.ua/handle/123456789/812	5977	1697
6	Kostyukevich VM Theory and methods of teaching football: textbook. Kyiv: CST, 2017. 310 p. https://dspace.vspu.edu.ua/handle/123456789/1173	5071	2349
7	Kholkovskaya I.L. Professional and pedagogical competence of a teacher of a higher educational institution: textbook. Vinnytsia: Nilan Ltd., 2017. 144 p. https://dspace.vspu.edu.ua/handle/123456789/1177	4561	1139

Table 1 (continued)

8	Vinnichuk A.P. Ukrainian folklore: textbook. Vinnytsia, 2018. 168 p. https://dspace.vspu.edu.ua/handle/123456789/2378	4430	1409
9	Gurzhiiy A.M., Gurevich R.S., Konoshevsky L.L., Konoshevsky O.L. Multimedia technologies and teaching aids: textbook. Vinnytsia: Nilan Ltd, 2017. 556 p. https://dspace.vspu.edu.ua/handle/123456789/1965	4194	1601
10	Nikitchenko L.O., Levchuk N.V. Methods of teaching biology and science: laboratory work. Vinnytsia: VSPU, 2016. 101p. https://dspace.vspu.edu.ua/handle/123456789/853	3846	862

Conclusions

The global trend of creating digital repositories in higher education institutions has accelerated as they become an important factor in ranking. Institutional repositories contribute to the practical impact of research, which not only benefits the community, but also demonstrates the importance of the work and enhances researchers' reputations. This research was carried out as part of the implementation of an innovative mini-project, "Library Web 2.0 - A Strategy For Building a University Library," as part of the central *Vinnytsia Mikhail Kotsyubynsky State Pedagogical University Library - A Model For a Modern Higher Education Library* (Library History, 2021).

Having analyzed the role of institutional repositories as an important tool for disseminating educational and scientific information, the authors illustrated that DIR fully performs informational, exploratory, and educational functions, and is an integrated resource; a powerful tool for promoting the research results of university scientists in the global scientific space.



Figure 7. Webometric rating of VSPU site

Besides, institutional repositories play an important role in raising the university Webometric ranking. Greater visibility of the university and its integration into the world educational and research structure potentially increases local and global rankings and citation indices, which are among the main factors of the higher educational institutions' attractiveness for potential applicants. The creation and implementation of IrVSPU influenced positive changes in Vinnytsia Mykhailo Kotsyubynsky State Pedagogical University ratings. In particular, the university has risen from 158 to 68th place in the Webometrics ranking over the last year (Figure 7).

An educational institution's official website, being a window to the world, is one of the most important means of promoting its activities and improving its competitive position in the educational services market. The research raises the issue of presenting educational institutions' international rankings on their official websites as an element of their marketing strategy aimed at increasing competitive advantage in the global educational space. The authors have developed a number of recommendations for improving the efficiency of higher education institutions' official websites. It is emphasized that the information on the HEI's official website should reflect the full range of educational, research, and administrative activities carried out by their faculty and students. When combined properly, these factors can enhance the business reputation, which includes the university's image, prestige, social responsibility, status, partnerships, business relations, etc. (Umanets, Shevchenko, & Bezugly, 2020).

Recently IrVSPU's rank in the Webometrics of Ukrainian repositories has noticeably changed. The number of scientific and educational publications in Google Academy, citation indices, and publications in PDF and MS-office formats (*.docx, *.doc, *.txt) are constantly increasing as well.

The authors emphasize and substantiate the importance of the institutional repository as a basis for scientific research and use in the university educational process. Regulatory documents and statistical materials related to the establishment and functioning of VSPU Institutional Repository were used. Prospects for further functioning of the repository in support of educational and scientific activities and improvement of the webometric rating of the university are outlined.

Perspectives For Further Research

The issues of providing scientists with the necessary domestic and world information resources, integrating scientific publications, and increasing the level of university science representation internationally is a strategically important area of any higher education institution. Libraries continue planning and developing institutional policies and strategies for disseminating research, maximizing their openness, accessibility, and scientific impact. The strategy for further work of Vinnytsia Mykhailo Kotsyubynsky State Pedagogical University's library is outlined as: further formation of open space resources and the institutional repository; exploring prospects of using DIR for educational and scientific activities support; elaborating principles and technologies for using the open science concept and the prospects of its application in the new model of the national pedagogical system.

Another promising research area may be found in further studying the effectiveness of the institutional repository resources usage in the formation of young university scientists' research competence, as well as comparative characteristics of domestic and foreign repositories in the field of higher pedagogical education. The library strives to create a successful repository. After all, a successful repository is beneficial to everyone: scientists, the library, departments, the university, and the country at large.

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