

Methods of Forming Electronic Resource Collections of Academic Libraries in a Digital Educational Environment, Criteria for Selecting Electronic Resources

Feruz Umaraliev

Doctoral student of the Institute of State and Culture of Uzbekistan, Tashkent, Uzbekistan
umaraliyevaferuza2511@gmail.com

Barno Ganieva

Library information system department Tashkent University of Information Technologies Tashkent, Uzbekistan
barnoxon1305@gmail.com

Nadira Usmanova

Library information system department Tashkent University of Information Technologies Tashkent, Uzbekistan
gummypiggy1991@gmail.com

Jorakhonova Khadicha

Library information system department Tashkent University of Information Technologies Tashkent, Uzbekistan
j.a.khadichakhan@gmail.com

Abstract—In today's digital educational landscape, the development of electronic resource collections in academic libraries holds significant importance. These collections not only offer extensive scientific information but also facilitate interactive and distance learning processes. By providing rapid and convenient access to educational materials through digital platforms, databases, and e-books, electronic resource collections empower users to efficiently locate and utilize information. This advancement is poised to elevate the scientific and creative endeavors of both students and academic staff, thereby enhancing the overall quality and effectiveness of education. The primary objective of this study is to analyze the process of developing electronic resource collections for academic libraries within the context of the digital educational environment. It seeks to explore the scientific and practical dimensions involved in selecting, acquiring, and subscribing to electronic resources. Furthermore, the study aims to identify the criteria and methodologies employed in this process, assess their effectiveness, and formulate recommendations for improvement. To conduct this research, various methods were examined and analyzed. To ensure comprehensive coverage and convenience for respondents, the online survey method was selected as the principal research approach. Four distinct surveys were designed to address different facets of the research objectives. These surveys focused on the selection criteria influencing decisions regarding the procurement of electronic resources, the strategies employed by specialists in forming electronic resource collections, and the criteria used to evaluate their effectiveness. All these aspects were thoroughly investigated and incorporated into the research. Based on the findings derived from this study, a series of

recommendations were formulated. Proposals were developed to tackle the challenges associated with the selection of electronic resources and the enhancement of their collections in university libraries across Uzbekistan.

Keywords—Academic library, consortium, database, electronic resource.

I. INTRODUCTION

In the digital age, academic libraries are facing challenges related to the transition from traditional print collections to electronic resources. This shift is driven by the need to provide users with convenient and important information in various formats, such as e-books, e-journals, and online databases [1],[2]. A library's collection is the cumulative result of acquiring, organizing, storing, and making resources openly available to users. The library's collection serves users' needs by providing resources for education, research, leisure, and information dissemination. According to Tiurkedzhy et al., modern practices in creating electronic libraries demonstrate insufficient access to content [3]. The authors emphasize the necessity of processes related to optimizing and promoting resources available in the library, but this study did not focus on analyzing search queries as one of the methods to ensure access to content. On the other hand, Berdykulova et al.'s research discusses the transition of traditional university education to the digital sphere [4]. In the study by Habibi, Mohd Faiz Mohd, and Sofwan, the functioning of digital libraries during the coronavirus pandemic was examined, with the authors proposing solutions to problems related to school closures and the inability to conduct offline learning [5].

Online ISSN 2256-070X

<https://doi.org/10.17770/etr2025vol3.8513>

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Akanova, Kozhasheva, and others have conducted scientific research on the systemic-functional methods of modeling electronic libraries. According to them, these methods are based on the interaction between key elements: function, structure, technologies, and management [6],[7].

Professor Ganiyeva B.I., in her article titled "The Development of Digital Libraries and Their Impact on Improving the Rankings of Higher Education Institutions," has elaborated on the concepts of "electronic," "digital," and "virtual" libraries. She has also addressed the impact of information library institutions on improving the rankings of higher education institutions [8]. Abdymanapov, Ronzhes, Tammara, and others, in their research, have stated that an academic electronic library is affiliated with a specific educational institution and serves the purpose of providing teachers and students with electronic materials for learning and research [9], [10], [11].

The main goal of this research is to identify and evaluate the criteria and methods used in forming and managing electronic resource collections, as well as to develop recommendations for improving the efficiency and quality of electronic resource collections in academic libraries in Uzbekistan.

II. MATERIALS AND METHODS

A. *Methods of Forming electronic resources in academic libraries*

The development of information and communication technologies has significantly changed how libraries acquire information resources and organize data. Libraries use various methods to purchase necessary electronic resources. However, L. Benny emphasizes that electronic resources can be acquired through purchase, subscription, or consortium agreements [12]. She also notes that the most widely used method for forming electronic resource collections in many libraries is subscribing to electronic resources. Similarly, according to F. Ifeoma and Achebe, the most effective way to provide access to e-books/journals in university libraries is through subscriptions to online databases that allow remote access via the internet [13]. Some libraries have successfully purchased electronic resources through consortia, benefiting from bulk discounts. Consortia are another way for libraries to learn about available electronic resources.

According to L. Creibaum and S. Holloway, there are four methods of forming electronic resources in academic libraries [14]:

Subscription: This is a method of obtaining a license to access information resources for an agreed period of time.

Purchase: Acquiring information resources through direct purchase.

Consortium: This is a cooperative association of libraries that coordinates resources. When many products are purchased through a consortium, discounts may be available, and there may be additional discounts for repeat

customers. Libraries that already own parts of the offered product may also benefit from reduced prices.

Open Access: Free and open online access to electronic resources. Several reputable publishers exist that provide free access to authentic and valuable content.

Analyzing users, selection policy, managing acquisitions, library staff, user community, weeding and preservation, collection evaluation, and resource sharing are considered functional factors of library collection management [15]. This is illustrated in "Fig. 1".



Fig. 1. Functional Aspects of Collection Formation/Management

Any library—whether academic, public, or school libraries (state, private, charter, independent, or international)—must have a detailed policy that governs the selection, rejection, or cancellation and review of library resources. The most critical policy is the selection policy, which is regularly reviewed and updated, and is familiar to all members of the library staff.

The selection of information resources is a fundamental function of library collection development, and the primary goal of the selection decision for any format remains the same: to meet the needs of users. D.A. Cabonero and L.B. Mayrena have emphasized in their articles that selection is the heart of collection development[16]. Selection is the first essential step in the acquisition process. Information materials are chosen based on their usefulness for a specific group of readers. This is because the level of satisfaction a reader finds in a library is directly dependent on the resources available in the library[17]. With the emergence of electronic resources, the job responsibilities of library professionals managing collections have significantly changed.

III. RESULTS AND DISCUSSION

A. *Selection of Electronic Resources and Research Results*

The concept of electronic resources refers to information sources that are studied, processed, and redesigned using modern information and communication technology (ICT) tools. They are often stored in cyberspace in the most precise and compact form and can

be accessed simultaneously by a wide audience from an unlimited number of locations.

The general types of electronic resources under consideration include the following:

- Databases,
- Continuing education websites,
- E-books/monographs,
- Full-text electronic journals,
- Internet websites,
- Reference tools,
- Teaching and learning materials, and so on.

In addition to collection development policies, the selection of electronic resources must align with the library's primary goals; otherwise, it may lead to the creation of an aimless and unnecessary electronic collection. In his article titled "The Changing Roles of Library Professionals and Bibliographers in the Era of Electronic Resources," Welch, T.M. emphasizes that staff have used traditional selection criteria such as quality, relevance, accessibility, and price to choose new materials for the purpose of collection development [18].

Similarly, as T.L. Davis has pointed out, the most essential criteria in traditional selection include evaluating the reputation of authors and publishers, assessing the level and depth of content, and considering special formats or features that add value to the title [19]. For electronic resources, these criteria quickly evolve into evaluating the involvement of other parties in the product's creation, ensuring the availability of accurate content, and confirming that the product performs as expected. W.B. Edgar examined the unique characteristics of collection content and noted that these characteristics can be used to guide the selection process.

The more features a resource has—such as subject, sub-topic, publication date, or format—the more precisely it can be selected, and vice versa [20].

This means that greater specificity is required to ensure that ideas within a body of knowledge are included in the designated collection.

In their research work titled "Managing Electronic Resources in Libraries: Research and Practice," H. Yu and S. Breivold Edgers confirm that librarians must now address new challenges as part of the selection and management processes, such as ensuring easy and quick access for users, evaluating persistent content, and resolving technological and legal issues [21].

In forming a quality collection, materials are evaluated based on specific criteria. It is not necessary for every element to fully meet all the criteria. Based on our research, we have divided all the criteria adopted for resource evaluation into three groups: *primary*, *secondary* and *special criteria for electronic information sources* "Fig.2". Through these criteria, it has been determined how materials can align with the collection and increase the efficiency of their use. Additionally, it is crucial to consider these criteria when selecting electronic resources to ensure their quality and relevance

to the intended purpose. Research has shown that applying the right criteria can make the collection more efficient and beneficial.

Electronic resources, unlike printed materials and multimedia materials related to books, often do not become the property of the library.

In many cases, libraries only acquire access rights to electronic resources, not ownership, which is achieved through subscription based on agreed license terms. Therefore, the team established for resource selection should include not only information technology specialists but also individuals with legal expertise. Additionally, the sharp increase in subscription prices for databases has led libraries to collaborate on purchasing. Cooperative purchasing is carried out in the form of a consortium.

As other authors have observed, while acknowledging the challenges posed by electronic resources, IFLA has noted that electronic resources introduce a number of barriers not encountered with traditional library materials.

In addition to the criteria applied to analog materials, electronic publications raise complex issues related to licensing, access, networking, pricing, intellectual property rights, and rapidly changing technologies and standards.

As H. Yu and S. Breivold Edgers have pointed out, when working with electronic resources, the librarian responsible for collection management cannot make an independent decision to purchase an electronic resource and must work closely with other library departments to evaluate the suitability of the resource. Typically, this involves consulting with staff responsible for technical systems and services, acquisitions, resource identification (cataloging and access), contract negotiation and licensing, and user support.

To involve users in collection development, the library can explore methods to gather feedback from its users regarding electronic resources. This may include feedback on potential new sources as well as existing resources. The library should inform users about new literature and services, as well as temporary issues that may arise with access to electronic resources. Detailed information about the resource is required to determine whether the electronic resource fits the library's collection and to help identify the actual and hidden costs of purchasing, storing, maintaining, and other related issues. In their research article titled "*Developing an Electronic Resources Collection: A Survey of Current Practices in Academic Libraries*," R. Flatley and K. Prock propose a five-step process for collecting electronic (or "digital") materials, which includes gathering content information, evaluating information content, organizing content, creating electronic resource collections, and preserving them [22].

In academic libraries, organizing an electronic resources collection requires a strategic approach that includes thorough needs assessment, collaboration models, trial usage programs, and continuous evaluation

processes. By focusing on the relevance of content, frequency of updates, accessibility, cost-effectiveness, and the reputation of the vendor—and adhering to clearly defined selection criteria—libraries can create robust electronic collections that meet the evolving needs of their academic communities in the digital learning environment. To achieve this goal, an online survey

involving 51 librarians from 8 university libraries was conducted to explore four methods of forming electronic resource collections. The data was tabulated and analyzed using basic statistics (average values).

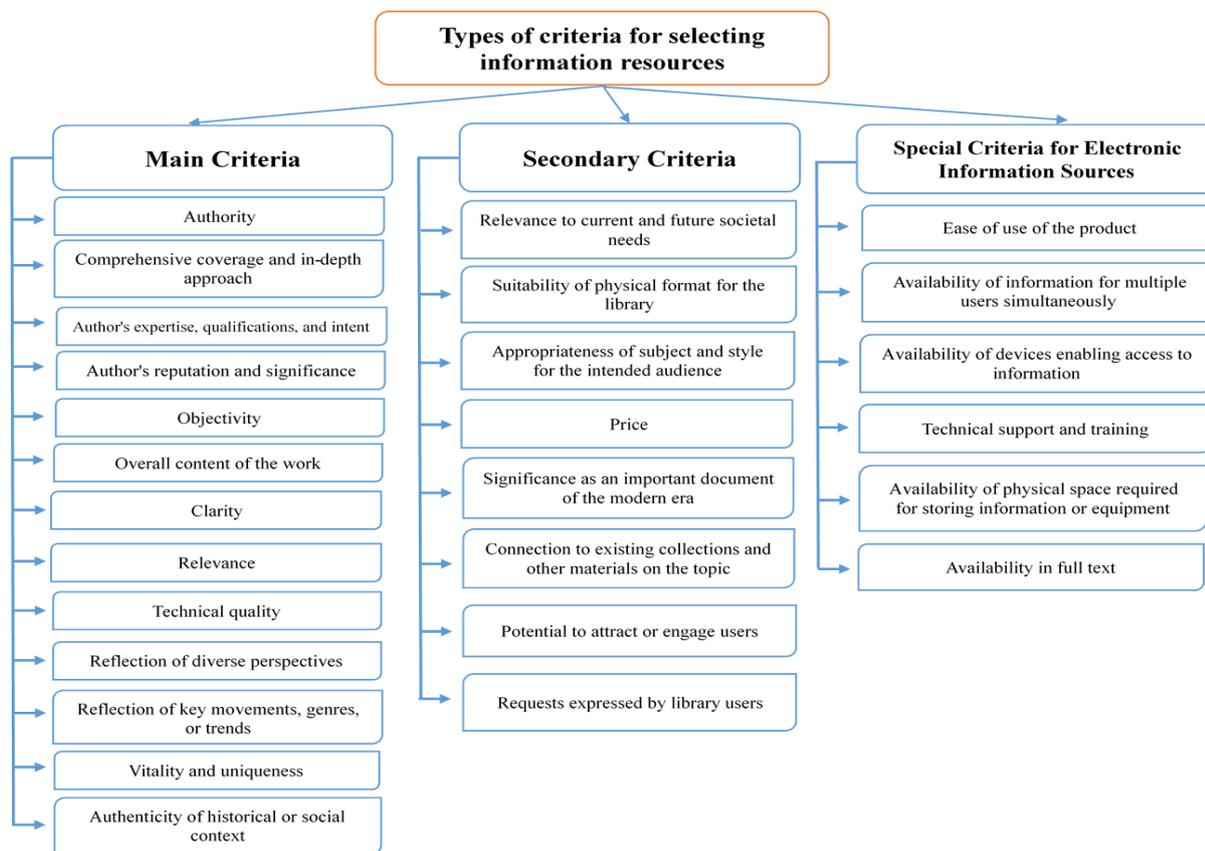


Fig. 2.

Types of Criteria for Selecting and Acquiring Information Resources.

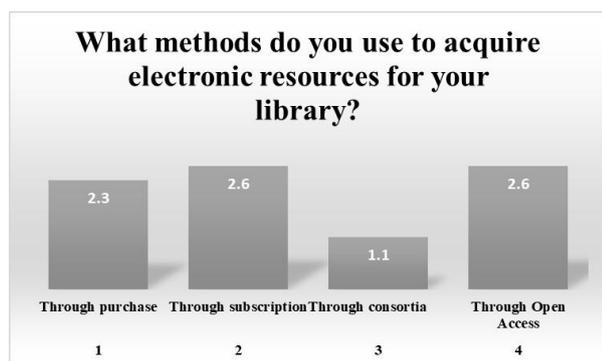


Fig. 3. Methods of forming electronic resources in the studied academic libraries.

The analysis results “Fig. 3” showed that forming electronic resource collections through consortia scored an average of 1.1, while subscriptions and open internet sources scored up to 2.6. These values were assessed using a 3-point rating scale (always = 3, sometimes = 2,

never = 1). Electronic resources must always be available, whether online or offline, to meet the needs of staff, students, researchers, and other library users.

B. Selection of Electronic Resources

From the primary and secondary criteria mentioned above for purchasing electronic resources, the 8 most important criteria suitable for scientific and academic library collections were selected. Based on these criteria, an online survey was conducted among librarians from 8 university information resource centers. The survey involved 51 staff members responsible for technical systems and services, acquisitions, resource identification (cataloging), contracts and licensing, and user support.

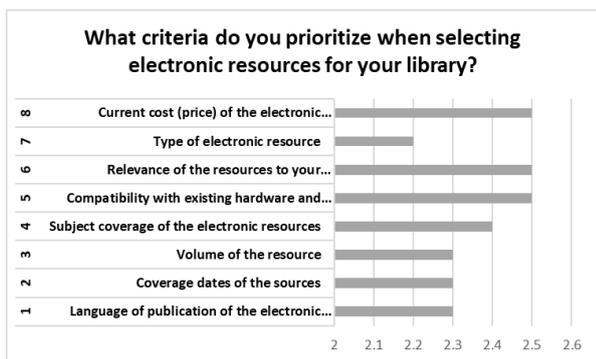


Fig. 4. Criteria for selecting electronic resources in the acquisition process.

Additionally, the overall average data “Fig. 4” showed that compatibility with existing hardware and software, the relevance of the resource to library users, and the current price of the resource (average = 2.5) received the highest scores, while the type of electronic resource (average = 2.2) received the lowest score among the criteria considered by libraries when selecting electronic resources. These values were assessed using a 3-point rating scale (always = 3, sometimes = 2, never = 1). Responses from the eight surveyed university libraries indicated that libraries evaluate resources in printed materials based on criteria such as price, content, location, and others. However, for electronic resources, librarians place greater emphasis on criteria such as subject relevance, authenticity of information, accessibility, price, the reputation of the vendor, and various technical factors. University librarians use various criteria when selecting electronic resources to ensure they choose and purchase the best options for their libraries.

C. Issues in Selecting and Acquiring Electronic Resources

Selecting and acquiring electronic resources in academic libraries can lead to a number of challenges that may affect collection development and user access. The main issues include:

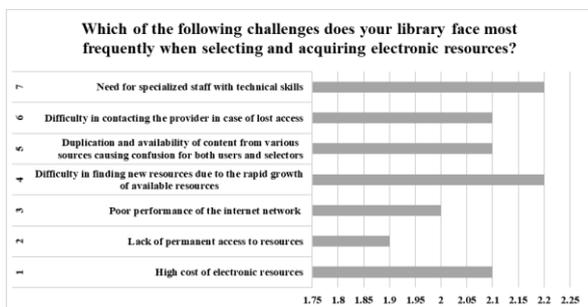


Fig. 5. Responses to challenges faced by your library in selecting and acquiring electronic resources.

The data presented in “Fig. 5” reflects the challenges faced by university libraries in Uzbekistan in forming electronic resource collections. This data is based on responses from librarians who participated in the survey, with the average values of the results ranging from a low

of 1.9 to a high of 2.2, calculated on a 3-point scale. These numbers indicate that for the majority of librarians, the process of forming electronic resource collections is highly complex and requires serious attention and improvement. Therefore, clear strategies and supportive measures are necessary to address these challenges. It can be emphasized that this data holds significant importance for improving the development and quality of use of electronic resources in university libraries.

IV. RECOMMENDATIONS

Based on the results of the survey and the analysis, the following recommendations are suggested to ensure a smooth process for selecting and purchasing electronic resources in university libraries in Uzbekistan. These recommendations aim to support the scientific, informational, and technological development of library services and to fully and effectively meet the information needs of users.

- Analyze the scientific and educational needs of students, professors, and researchers.
- Identify the most in-demand databases by field (for example, JSTOR, ScienceDirect, SpringerLink, IEEE Xplore, and others).
- Determine the most necessary electronic resources through surveys among users.
- Use statistics on how often electronic resources are used to identify the most useful platforms.
- Analyze how electronic resources in scientific databases impact the scientific work of universities (for example, count how many articles, dissertations, or research papers are created based on these resources).
- Study and apply international licensing procedures for using electronic resources.
- Allocate financial support from the organization’s budget to train staff responsible for developing electronic collections in university libraries in Uzbekistan.
- Create a consortium among Uzbek libraries and make effective use of discounts offered by the consortium.
- Train and retrain library staff in technical skills and software. This is important for solving any technical problems that may occur when using electronic resources.

CONCLUSION

The article explores the methods of forming electronic resources in academic libraries within the digital education environment, emphasizing the criteria for selecting high-quality resources. The primary goal of this research was to thoroughly analyze the process of creating electronic resource collections for academic libraries, as well as to study the scientific and practical

aspects of selecting, purchasing, and subscribing to electronic resources. Additionally, identifying the criteria and methods used in this process, evaluating their effectiveness, and developing recommendations for improvement are key focuses of the study. This ensures the provision of high-quality, relevant, and modern information resources. The article highlights the main approaches to developing electronic collections, including institutional repositories, subscription-based databases, and open-access resources. The selection policy is based on factors such as alignment with academic programs, reliability, accessibility, and cost-effectiveness. Furthermore, the article examines common challenges in selecting and purchasing electronic resources, such as budget constraints, licensing issues, and ensuring long-term usability. By addressing these challenges, academic libraries can expand their electronic collections to better support education and research. According to the research findings, libraries primarily acquire electronic resources through subscriptions and individual purchases. None of the libraries studied in the research formed a consortium with other libraries. Establishing a consortium would enable libraries to pool resources, share scientific and literary materials, and collaboratively purchase new books, journals, and electronic resources. This would reduce individual costs for each library and allow for more efficient use of resources. Based on the research results, recommendations were developed for university libraries in Uzbekistan regarding the selection and development of electronic resource collections. These recommendations aim to further improve and enhance the effectiveness of electronic resource collections.

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