

## AI-Powered Libraries: Comparative Insights for an Adaptive Repository

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### Abstract

This paper examines how academic staff access and use e-books, and what features they expect from a future digital library platform. Based on survey results, the study reveals that most respondents rely on informal sources, while official databases are used less frequently. At the same time, there is strong demand for key functionalities such as access to a wide collection of e-books, quiz generation, personalized recommendations, and tools for tracking student performance. In addition, the paper provides a comparative review of existing platforms—Perlego, QuizBot, Bookmate, Khan Academy, and Scopus—highlighting both their strengths and limitations, particularly with respect to language support and integration. Taken together, the survey findings and platform analysis underscore the need for a unified adaptive platform that connects publishers, libraries, and users, thereby enhancing accessibility, interoperability, and effectiveness in digital learning.

**Keywords:** E-books; digital library platforms; adaptive learning; personalization; interoperability; accessibility

### Introduction

Library automation has improved in accuracy and efficiency via the application of artificial intelligence techniques. The concept of implementing intelligent library systems to replace conventional ones started to take shape around 1990. Libraries employ intelligent systems that use data analysis to deliver knowledge and information services to patrons. These systems, which serve as an addition to the primary library complex, may make well-informed judgments about where to look for and how to use information resources (Asemi, A et al. 2021).

Teaching and learning methods at all levels of the academic system have changed as a result of the recent, sharp acceleration of the digital revolution in education. At the center of this transition are digital platforms and e-books, which have become crucial instruments for enhancing access to educational materials and fostering more flexible, personalized and interactive learning (Schmidt, J. T., & et al. 2020). The broad trend toward a move to digital techniques intended to enhance the caliber and accessibility of academic information is reflected in their growing adoption by universities, instructors, and students.

E-book platforms have become essential in higher education, where prompt access to relevant learning resources is critical. They provide educators with tools to better promote student engagement, allow institutions to improve resource distribution, and allow learners to connect with information in a more dynamic way (Du Plooy, E. et al., 2024). Platforms that provide creative, flexible, and integrated learning solutions are becoming more and more necessary as the need for intelligent educational technology rises.

The adoption of automated library systems intersects with broader questions of public policy and management. The governance of digital knowledge infrastructures requires balancing efficiency with principles of equity and inclusivity, ensuring that technological change does not deepen information gaps among different groups of users (Wang, 2024). Libraries are increasingly positioned as public institutions that support national and institutional strategies for digital inclusion, making their automation initiatives subject to policy frameworks around access, funding, and accountability (Ciancarini, Giancarlo, & Grimaudo, 2023). Decisions about licensing agreements with commercial e-platforms also reflect management challenges related to transparency, sustainability, and the negotiation of public–private partnerships. These considerations emphasize that intelligent platforms are not only tools for enhancing educational services, but also key components

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of public information policy and organizational governance. Embedding them within coherent regulatory and managerial structures is therefore critical to ensuring their long-term effectiveness and public value.

This article presents a comprehensive analysis of the technical specifications and functional capabilities of leading e-platforms, including Perlego, QuizBot, Bookmate, Khan Academy, and Scopus. The study aims to identify the key features, strengths, and limitations of each platform in terms of their technological implementation and user experience. Special attention is given to evaluating the applicability of these platforms in the development of an adaptive system for integrating publishing resources with library infrastructures. The analysis highlights the potential of leveraging electronic publishing technologies and artificial intelligence to enhance access to educational and research content. The findings provide a foundation for future development of intelligent library services.

### ***Literature Review***

Integration of AI to e-library systems results in various benefits, the most important of which is increased efficiency (Oyetola et al., 2023). However, it does not come without concerns, such as job losses and disruptions of service flow (Ali et al., 2022). Successful integration of AI requires more than just having the right technology. It also involves selecting appropriate practical solutions, addressing algorithmic bias, ensuring ethical use, and establishing clear policies for AI implementation.

In academic and digital library environments, where AI is increasingly seen as a transformational tool for improving service delivery and user engagement, recent research has shed further light on these processes. For example, a comparison of AI strategies in academic libraries in mainland China and the United Kingdom shows glaring disparities in adoption: Chinese universities usually highlight AI in their vision statements, emphasizing the development of new majors and research initiatives in AI technologies, whereas UK university strategies hardly ever mention AI explicitly (Huang et al., 2023). With Chinese libraries more aggressively deploying “smart” or “intelligent” systems, this disparity demonstrates how national goals impact AI integration. In contrast, UK libraries lag in strategic priority, which may restrict their flexibility in digital settings.

Adding to this, empirical research conducted among Polish university librarians using Delphi methods presents AI primarily as a helpful tool rather than a partner or enemy. Experts concur that AI is useful for tasks like indexing, literature reviews, and collection management, but they are hesitant to use it for complex information advising because of concerns about information quality and result verification (Kisilowska-Szurmińska, 2025). In order to reduce biases and promote favorable attitudes toward adoption, the study emphasizes the necessity of developing librarians’ critical thinking and ethical judgment skills as well as their AI literacy. Similar to this, a SWOT analysis of AI applications in Pakistani university libraries finds that while there are opportunities for increased user personalization, the risks of job displacement outweigh the advantages (such as better automation in cataloging and reference services), while also highlighting infrastructure limitations, funding shortages, and ethical concerns like data privacy (Ali et al., 2024). These results are consistent with larger patterns in which societal concerns limit AI’s ability to automate repetitive jobs, highlighting the need for ethical frameworks and employee training to promote fair adoption. Additionally, a study on librarian acceptance of AI in Islamabad’s academic libraries, using the Technology Acceptance Model, found that perceived interactivity and usefulness significantly influence attitudes toward AI, while ease of use has minimal impact, suggesting the need for awareness programs to boost adoption (Hussain, 2025).

By offering tailored recommendations that suit user interests and habits, artificial intelligence (AI) has been crucial in the field of recommendation systems, helping users overcome information overload. On a dataset of 5,000 academic abstracts, a prototype AI-driven framework that combined machine learning (ML) and natural language processing (NLP) for semantic search in digital libraries showed better performance, attaining 87 % precision and 85 % recall as opposed to 68 % and 64 % for conventional keyword-based methods, while increasing user satisfaction by 35 % (Mahadi et al., 2025). While issues like computing costs and data quality dependence present obstacles for smaller institutions, the system’s adaptive ranking and feedback loops demonstrate how hybrid AI models may improve suggestions over time. In addition, sentiment analysis and topic modeling of new developments in library and information science show that people have favorable opinions about AI-powered recommendation systems. Themes highlight personalized book recommendations and RFID-enabled cataloging as ways to improve user engagement and resource efficiency (Rajeevan et al., 2025). As discussed in Library 5.0, where AI allows personalized material suggestions

based on user data, such systems not only encourage chance discovery but also facilitate multidisciplinary access, transforming libraries from static archives to dynamic, intelligent ecosystems (Noh, 2023).

Studies supporting transformer-based models like BERT to enhance query comprehension and incorporate knowledge graphs for multilingual support highlight AI's potential for personalization in digital libraries. This enhances recommendation accuracy and inclusivity (Mahadi et al., 2025). Initiatives like European's AI implementations for discoverability serve as examples of how AI recommendation tools are becoming more and more integrated into collection development policies in academic settings, which are moving toward digital-first strategies that use machine learning to improve metadata and provide user-centric recommendations (Hasan & Panda, 2025). However, ethical issues like algorithmic bias in suggestions that can maintain disparities in resource access must be addressed in light of these developments. Additionally, a bibliometric study of 354 papers published between 2010 and 2023 reveals important trends in AI for academic libraries, including chatbots and machine learning, with a spike in production after 2015 and a focus on intelligent systems, exposing ethical and collaborative gaps (Islam et al., 2025).

Though there aren't much research specifically on the subject, AI techniques are becoming increasingly important for assessing user advancement and institutional effectiveness in educational libraries. In line with evaluation frameworks to provide formative feedback and resource optimization, broader analyses show that AI can enable real-time analytics and predictive modeling for borrowing patterns (Scott & Ward, 2025). AI literacy tests, for example, indicate gaps in librarians' readiness in higher education settings; surveys indicate that librarians' self-rated abilities are modest, and training in ethical evaluation of AI outputs is recommended to guarantee objective evaluations (Lo, 2024). When combined with platforms like QuizBot, these techniques allow for compliance with educational standards like Bloom's taxonomy, including progress monitoring and individualized quizzes. However, human control is necessary to reduce biases and hallucinations in created material. To elaborate, the AILIS 1.0 framework assesses AI literacy in library and information science, identifying fundamental aspects such as Functioning, Ethics, and Evaluation. Professionals outperform students in this framework, underscoring the necessity of focused training to address overestimation of competencies (Montesi et al., 2025).

AI-related ethical concerns in libraries have drawn more attention recently, with research identifying prejudice, privacy violations, and transparency as the main challenges. A Delphi survey highlights librarians' concerns about job loss and dehumanization, and it calls for ethical standards that give human supervision in AI implementations first priority (Kisilowska-Szurmińska, 2025). Similar to this, SWOT studies in Pakistani contexts highlight ethical conundrums such as data permission and the effects on society's privacy as threats, calling for laws promoting responsible AI usage (Ali et al., 2020). The necessity for equitable techniques is emphasized by broader evaluations of AI ethics in libraries, with bibliometric analyses revealing a spike in publications from 2020–2025 that concentrate on global consequences, such as psychological hazards and environmental repercussions (Qiu et al., 2025). The integration of AI in Uzbekistan's higher education poses questions about cultural adaptation and legal frameworks, suggesting standards for moral governance to strike a balance between innovation and equality (Khudayberganovna et al., 2025). Together, these observations highlight how crucial it is for libraries to provide explicit ethical guidelines, carry out bias assessments, and make retraining investments in order to capitalize on AI's advantages while preserving user confidence and inclusion.

Moreover, explorations of ChatGPT in library services reveal high awareness and usage for customer service (86.67 %) and research assistance (58.67 %), but privacy (65 %) and ethical concerns (60 %) persist, supporting integration with ethical safeguards (Patra et al., 2025). Similarly, generative AI demonstrates strong potential to enhance access services through personalized learning and efficient circulation management, yet risks such as bias and workforce displacement necessitate comprehensive planning and staff training (Boateng, 2025).

All things considered, research from 2020 to 2025 presents AI as a two-edged sword in e-library systems: a driver of effectiveness, customization, and adaptive services, but also rife with moral, practical, and human-centered issues. Future advancements should put an emphasis on user-centered designs, collaborative frameworks, and multilingual assistance in order to construct integrated platforms that improve equality and accessibility in academic settings. Best practices should be informed by these varied worldwide viewpoints.

### **Methodology**

To better understand how academic teaching staff in Almaty universities use electronic resources and what functions they would like to see in an AI-based e-library system, we carried out an anonymous survey.

The questionnaire was designed in such a way that it did not collect demographic information such as gender, age, university affiliation, or academic rank. This decision ensured maximum anonymity but also limited the possibility of subgroup analysis and assessment of representativeness. The focus of the study was specifically on the practices and expectations of university teaching staff. The survey asked about the most important features of e-book platforms, such as access to content, ease of use, integration with university systems, and interactive learning tools. In total, 114 people took part in the survey, and after data cleaning, 66 complete responses were included in the analysis. 48 responses were excluded because they were incomplete or inconsistent. These responses lacked answers to key sections required for analysis (e.g., methods of access and evaluation of platform functionality). To ensure comparability and reliability of the dataset, only 66 complete and coherent responses were included in the final analysis.

An online questionnaire was used to collect data, designed to study practices of e-book usage and to identify requirements for the functionality of intelligent library platforms. The questionnaire included both closed and open-ended questions, which allowed for gathering both quantitative and qualitative information.

The structure of the survey consisted of several blocks. The first block contained questions about the language of the survey, the intensity of e-resource use compared to printed editions, and the channels of access to digital materials (university subscriptions, open internet resources, commercial platforms, etc.). The second block focused on the evaluation of basic and advanced e-library functions: interface usability, content search, offline access, support for various formats, annotation and bookmarking, as well as integration with learning management systems.

The third block included questions about perceptions of innovative features such as automated quizzes, personalized recommendations, and simulation tools. The final part of the questionnaire consisted of open-ended questions, allowing respondents to specify the most valuable functions, possible challenges, and additional suggestions.

This structure of the instrument made it possible to obtain comprehensive data on current practices and user expectations, providing a foundation for further analysis and the development of recommendations for designing AI-oriented e-library systems.

Today there are many digital platforms that provide access to educational and research content. They differ in their focus, functions, and business models, but all of them try to make learning more convenient and engaging. Below are several examples that are most relevant for our project.

**Perlego** is often called the “Spotify for textbooks.” It gives users unlimited access to more than one million academic and professional books. The platform includes useful study tools such as highlighting, notes, bookmarks, and automatic citations. A special feature is the AI-powered Smart Search and a Research Assistant that helps students and researchers work more effectively. Perlego works on different devices and supports offline reading.

Access is based on a subscription: \$18 per month or \$144 per year. For institutions, there are special packages with administrative tools and integration with learning systems. The main limitation is that the platform does not yet support the Kazakh language.

Perlego’s business model is subscription-based. The service offers two plans: monthly for \$18 and annual for \$144 (equivalent to \$12 per month). For institutions, there are special packages with administrative tools and integration with learning systems. This model provides users with full access to an extensive academic library without the need to purchase individual books, increasing accessibility and ease of use. Perlego’s institutional business model is subscription-based and offers two tiers: 1) up to 100 users—the standard package offers instant registration through the website, access to over a million titles, personalized reading and research tools, and administrative management. 2) For more than 100 users—customized pricing with enhanced support (dedicated manager, training webinars, integration with university systems, and priority support).

Registration is possible via links, email invitations, auto-accounts, and LTI (Learning Tool Interoperability), ensuring seamless integration. This model makes access to academic resources scalable and adaptable to the needs of educational institutions (Perlego, 2024).

**Bookmate** is a subscription service for e-books and audiobooks. Its catalog includes over 1.8 million titles in 16 languages. One of its main features is social reading: users can follow friends, share quotes, and recommend books. The service also offers personalized book suggestions and offline access on different devices.

Bookmate’s business model is built on a tiered subscription. A free account provides access to a comprehensive library of public domain works, a standard subscription expands the selection of e-books and au-

diobooks, and a premium plan provides full access to the library, including new bestsellers and exclusive content. This system allows users to tailor their spending to their personal reading habits.

To expand its reach, Bookmate is developing partnerships with mobile operators and equipment manufacturers, such as Kcell (Kazakhstan), Indosat (Indonesia), StarHub (Singapore), Azercell (Azerbaijan), and Tigo (Latin America). These agreements ensure app pre-installation and payment via operator bills. Furthermore, a multilingual catalog and compatibility with various devices make the platform attractive to educational institutions seeking to digitalize their educational materials.

Thus, the combination of a subscription model and strategic partnerships allows Bookmate to position itself as an accessible and flexible tool for a global audience.

**Quizbot.ai** is designed to help teachers and students create and use quizzes. The system uses artificial intelligence to generate different types of questions (multiple-choice, true/false, fill-in-the-blank, and others). It can work with various sources, such as PDFs, videos, or websites, and export quizzes to LMS platforms like Moodle or Canvas. Quizbot.ai also has plagiarism detection, grammar correction, and tools for tracking student progress.

The platform works on a subscription model, with a free trial and several paid plans. It is flexible and scalable, but like Perlego and Bookmate, it does not yet support Kazakh.

Quizbot.ai's business model is subscription-based. The platform offers a free trial with a limited number of questions and several paid plans that include advanced features, such as plagiarism checking, an AI editor, and tools for identifying AI-generated content. This model allows users to choose the optimal option for both personal and institutional use.

For educational institutions, Quizbot.ai is attractive due to its integration with LMS, multilingual support, and the ability to create differentiated assessments. These features make the platform a useful tool for improving testing systems and enhancing the quality of the educational process.

**Khan Academy** is a free educational platform that provides courses in many subjects, from math and science to economics and history. Lessons are presented in short video lectures and interactive exercises. The system adapts to the level of each learner, and teachers and parents can monitor progress through dashboards. Gamification elements (badges, points) are also used to keep students motivated. The strengths of Khan Academy are accessibility and adaptiveness. However, advanced university-level content is limited, and live tutoring is not available.

Khan Academy operates on a non-profit, open-access model: all content is provided free of charge, and funding is provided through grants, donations, and partnerships. This model makes education as accessible as possible but limits the development of paid services.

Scopus is one of the largest databases of academic publications. It covers more than 78 million publications and provides detailed author profiles and citation metrics (h-index, CiteScore, etc.). Researchers use it to track trends, analyze literature, and identify reliable journals for publication. Scopus also integrates with many external systems and offers strong visualization tools. The main drawback is the high subscription cost and lack of Kazakh language support.

Scopus operates on a subscription model (B2B): universities, research organizations, and libraries purchase access to the database through a license. Revenue is generated through institutional subscriptions, but the high price limits access for individual researchers and organizations with limited budgets.

### **Results**

As previously mentioned, after cleaning the data and removing incomplete questionnaires, we had **66 respondents** left. In the multiple-choice question, they made a total of **99 selections (clicks)**, which reflects the distribution of access methods to e-books. The majority indicated that they download PDF books from various websites — 64 selections, while fewer reported accessing e-books through the university's subscription to a paid database — 17 selections. Only a small number mentioned buying or renting from publishers' websites — 8 selections, or from platforms such as Amazon and others — 10 selections. This shows that most participants rely on informal sources, with official access channels used much less frequently. The chart presented in Figure 1 clearly illustrates which channels of accessing e-books are the most common and which are used less frequently.

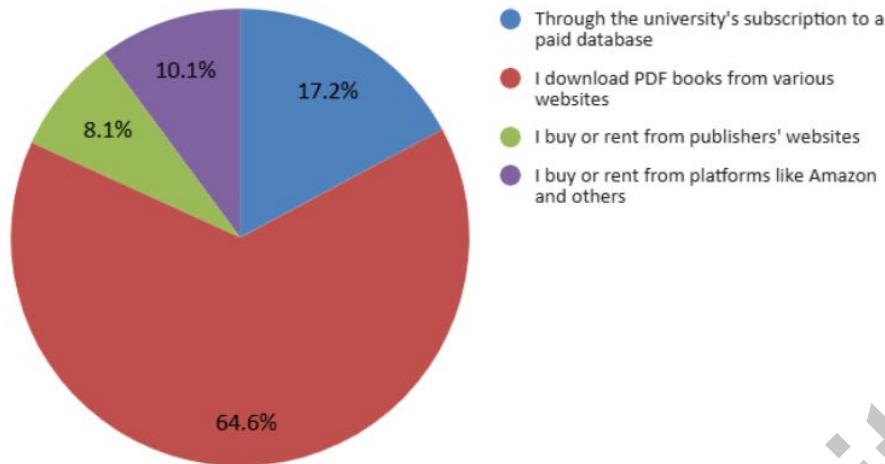


Figure 1. Methods of Accessing E-books

Note — compiled by authors

In Figure 2, the bar chart illustrates the demand for different potential functionalities of the platform, with all ratings indicating consistently high interest, ranging from **8.67** to **9.23** on a ten-point scale. The most significant feature identified by the respondents is **access to a library of electronic books** (9.23), which would provide a wide selection of e-books from various publishers. High demand is also observed for **quiz generation for students** (8.86) and **personalized reading recommendations** (8.86), reflecting the importance of tools that both assess students' understanding and support individualized learning pathways. Slightly lower, though still highly valued, is the functionality of **uploading course learning results and resource recommendations** (8.85), enabling the integration of learning outcomes with relevant e-book suggestions. Respondents also expressed considerable interest in **student performance analysis** (8.74), offering insights into progress and achievement, and in **textbook content suggestions for publishers** (8.67), where course results could inform the creation of more relevant educational materials. Overall, the chart demonstrates a comprehensive demand for such a platform, as respondents expect it to provide not only broad access to resources but also advanced tools for analysis and personalization of the learning process.

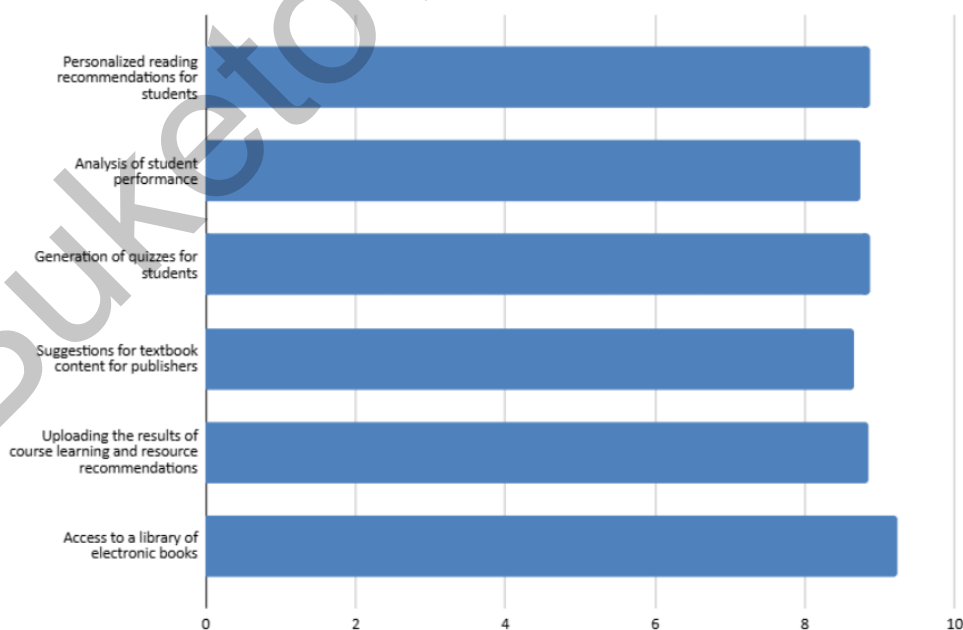


Figure 2. Demand for Platform Functionalities

Note — compiled by authors

Below in Table 1 Comparative summary of existing platforms is presented and highlights the unique strengths of each platform: Perlego emphasizes academic content with AI-powered search and study tools, though its coverage of non-English or region-specific materials may be limited; QuizBot provides adaptive testing and assessment capabilities, but its effectiveness depends on question quality and algorithm accuracy; Khan Academy delivers large-scale, free learning through adaptive pathways, yet it lacks specialized academic resources for advanced research; Scopus offers advanced analytics and citation tracking for research, although access requires costly subscriptions and not all journals are included; and Bookmate stands out with its multilingual catalog and strong social and mobile features, but it is less academically oriented and may not fully support scholarly research needs.

Table 1. Comparative Summary

#	Platform	Learning content	Research Indexing	Personalization	AI tools	Gamification	Integration to other services	Limitations
1	Perlego	Yes (academic books)	No	Yes	Yes	No	Limited	Does not support Kazakh language
2	Quizbot	Yes (quizzes, assessment)	No	Yes	Yes	Partial	No	Does not support Kazakh language
3	Khan Academy	Yes (K-12 prep)	No	Yes	No info	Yes	Yes	- limited options for advanced courses; - support for Kazakh language only subtitles
4	Scopus	No	Yes	No	Partial	No	Yes	Does not support Kazakh language
5	Bookmate	Yes (e-books, audiobooks)	No	Yes	No info	Social	Moderate	Does not support Kazakh language

*Note — compiled by authors*

In exploring successful digital education tools, three platforms—Perlego, Bookmate, and Quizbot.ai—offer useful models for scalable and user-friendly access to educational content.

Perlego positions itself as an academic-focused e-library. With over one million textbooks available through a monthly or yearly subscription, it caters to both individual learners and institutions. Features like AI-powered search, offline reading, and integrated note-taking make it ideal for academic use. For institutions, Perlego offers scalable subscription models, administrative tools, and LTI-based integration for seamless adoption into learning environments.

Bookmate, by contrast, emphasizes accessibility and engagement. Its library includes over 1.8 million eBooks and audiobooks in 16 languages. The platform supports social reading and personalized recommendations, aiming to make reading a community-driven, mobile-first experience. Bookmate also partners with mobile operators and educational institutions to expand its reach, offering flexible plans to suit different reader profiles.

Quizbot.ai is a different kind of tool—AI-driven and focused on assessment creation. It generates diverse question types from various content formats and aligns them with Bloom’s taxonomy. With multilingual support and LMS integration (e.g., Moodle, Canvas), Quizbot is designed for global educational use. Its subscription model ranges from a limited free trial to paid plans with advanced AI features and institutional support options.

Together, these platforms demonstrate how digital education tools can combine content breadth, user-centric design, and institutional scalability. Their diverse approaches to content delivery and monetization offer valuable insights for developing flexible, modern learning ecosystems.

These platforms illustrate a range of approaches to digital content delivery and educational support. While Perlego emphasizes academic resources and institutional scalability, Bookmate combines reading with social engagement and multilingual access, and Quizbot.ai focuses on AI-driven content generation and assessment tools. Each platform’s business model reflects a growing demand for flexible, user-centric, and

scalable solutions in digital education, offering important insights for the design of future adaptive learning platforms.

Currently, the publishing industry's business model in Kazakhstan is primarily based on selling printed publications, which generate the bulk of revenue. Electronic resources are also available on the market. However, their distribution is primarily limited to the institutional segment: large universities purchase access to digital libraries to support their students and faculty. This approach creates a relatively narrow market for digital solutions and does not reach a broad audience of individual users.

A promising model could include expanding e-book subscriptions to a broader range of universities and developing personalized services for end users. Introducing adaptive features, integration with educational platforms, and improved user-friendliness could generate sustainable interest in electronic publications. Such a transformation would not only stimulate growth in the digital resource segment but also ensure a gradual shift toward a hybrid use of print and electronic formats.

One promising approach is pay-per-use pricing for e-books with revenue sharing. If the project scales up to the CIS, co-financing options are possible. A key prerequisite for the success of this model will be ongoing technical support and an analytics system: data on book usage is necessary for fair profit distribution and assessing content demand.

### ***Recommendations and Development Steps***

**Author Engagement** — Incentivize textbook creation through revenue sharing mechanisms, grant support, and partnerships with universities.

**Focus on Digital Format** — Develop functionality that increases interest in e-books: interactive elements, quizzes, and analytics for students and teachers.

**Technical Support** — Built-in content integration and maintenance services to compensate for the lack of IT resources

**Analytics System** — Transparent accounting of book usage will form the basis for trust and fair revenue distribution.

**Regional Development** — From the early stages, it is important to consider the requirements and specific features of different CIS countries for future expansion.

### ***Conclusion***

The survey results demonstrate that electronic resources already occupy a significant place in the academic practices of university staff. However, most respondents continue to rely on informal access channels, while official institutional subscriptions remain insufficiently used. At the same time, there is a clear and steady demand for advanced functionalities—comprehensive e-libraries, automatic quiz generation, personalized recommendations, and analytical tools—that could support both teaching and research activities. This points to the necessity of developing an integrated digital platform capable of combining wide content access with intelligent educational services.

A comparative overview of platforms such as Perlego, Quizbot.ai, Khan Academy, Bookmate, and Scopus reveals that the market offers a wide range of technological approaches. Each platform has distinct strengths: some emphasize academic rigor and research metrics (Perlego, Scopus), while others focus on user adaptability and accessibility (Quizbot, Bookmate). Despite these differences, the convergence around interoperability, personalization, and intelligent support systems emerges as a general trend. At the same time, existing limitations—lack of support for Kazakh language, partial integration with local educational systems, and incomplete content coverage—remain significant barriers.

In the context of Kazakhstan, the publishing industry still relies mainly on sales of printed publications, which generate the largest share of revenue. Electronic resources are present, but their distribution is largely confined to institutional subscriptions purchased by major universities. This approach restricts the digital market and leaves individual users outside its scope. A more promising direction could be the expansion of subscription access to a wider range of universities, coupled with the development of personalized services for end users. Such steps would not only broaden the audience for digital content but also foster a gradual transition to a hybrid system where print and electronic formats complement each other.

An additional factor for sustainable development is the adoption of new business models. Pay-per-use mechanisms with revenue sharing between publishers and platform providers appear particularly viable. If scaled to the CIS region, such models could be supported by co-financing schemes. However, their success will depend on constant technical support and the establishment of transparent usage analytics, which are essential both for fair distribution of income and for evaluating the demand for content.

Taken together, the findings of this study underscore the urgent need for a unified adaptive platform that would bring together publishers, libraries, and learners. Its effectiveness will depend on AI-powered services, multilingual functionality, and reliable long-term technical maintenance. The implementation of such infrastructure can help overcome current fragmentation, improve accessibility, and contribute to the modernization of Kazakhstan's publishing sector in line with international trends in higher education.

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