



REQUIREMENTS FOR DEVELOPING A DIGITAL PLATFORM AIMED AT ORGANIZING STUDENTS' EXTRACURRICULAR LEARNING ACTIVITIES

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***Abstract** This article analyzes scholars' research on the requirements for developing digital educational technologies. It also outlines the requirements for creating a digital platform aimed at organizing students' extracurricular learning activities.*

***Keywords;** digital educational platform, open information-educational environment, requirement, extracurricular learning activity, online club*

Introduction

Today, the connection of general secondary education schools to the global internet network and the increasing need for students to use educational environments during the educational and upbringing process, as well as the fact that students spend time on social media during their free time, has led to the necessity of creating and implementing digital educational platforms aimed at organizing students' extracurricular learning activities.

In this area, scientific research has been conducted by scholars in our country and the Commonwealth of Independent States such as A.A. Abdukodirov [1], U.Sh. Begimkulov [2], N.I. Taylakov [3], S.Q. Tursunov [4], M.H. Lutfillaev [5], N.N. Khakonova [6], T.V. Plakhotya [6], I.V. Serzhenko [7], N.N. Bikova [8], F.L. Ratner [9], A.V. Obrubova [10], J.J. Karbozova [11], D.A. Makhotin [12], and V.A. Krasilnikova [13].

Specifically, A.A. Abdukodirov [1], I.V. Serzhenko [7], and N.N. Bikova [8] developed principles and requirements related to creating the didactic support for implementing distance education in higher education institutions. Their research presents requirements for distance learning in higher education institutions. However, the requirements proposed by these scholars cannot be fully applied to general secondary schools. In other words, differences arise when adapting to the psychological and psychophysiological characteristics of students. U.Sh. Begimkulov [2] and D.A. Makhotin [12] proposed requirements for developing electronic educational-methodical complexes. However, their research did not pay enough attention to the requirements for educational environments placed on global network addresses. N.I. Taylakov [3] and F.L. Ratner [9] developed requirements for creating electronic textbooks. The requirements developed by these scholars differ in several aspects from those necessary for creating digital educational platforms. S.Q. Tursunov proposed requirements for creating electronic educational resources for teaching the subject of web design in higher pedagogical institutions [4]. His work placed particular emphasis on requirements related to colors and fonts. However, it does not fully correspond to the requirements for creating digital educational platforms. M.H. Lutfillayev proposed requirements for developing didactic electronic educational resources for biology subjects [5]. His research did not discuss requirements for developing educational platforms hosted on global network addresses. A.V. Obrubova proposed requirements for developing electronic educational resources for training future artists [10]. Her research mainly focused on art education. J.J. Karbozova [11] and V.A. Krasilnikova [13] developed requirements for creating electronic

educational resources aimed at enhancing the creative abilities of future teachers in professional subjects. Their focus was mainly on developing offline educational tools. N.N. Khakonova and T.V. Plakhotya presented requirements and principles for developing internal control systems in educational institutions [6]. Their research focused mainly on requirements related to designing control systems.

The above-mentioned studies by scholars present requirements for developing didactic educational tools used in the educational and upbringing process in higher education institutions. These requirements differ in several respects from the requirements for creating digital educational platforms used in the educational and upbringing process of general secondary schools. For example, they differ in terms of the psychological and psychophysiological characteristics of students, user experience, and similar factors.

At the same time, the research of U.M. Mirsanov [194] and J. Elmurodov [195] developed requirements and principles for creating open information-educational environments for the educational and upbringing process of general secondary schools. Specifically, U.M. Mirsanov outlined requirements and principles for creating an information-educational environment for teaching mathematics in grades 5–6. These included the following requirements and principles [14]:

Requirements and Principles Identified by Other Scholars (Continued)

- **Control theory:** (should be aimed at algorithmic actions of the student, formalizing, transmitting, continuously managing and controlling a number of tasks by the mathematics teacher);

- **Psychological:** (in organizing the teaching process of mathematics, a learner-centered approach must be considered, taking into account the individual characteristics of the student and shaping mental activity through the external environment);
- **Didactic:** (main principles of traditional didactics, preparation and presentation of mathematics-related content, general principles of teaching using application programs, managing the student's activity, preparing and presenting materials);
- **Methodological:** (organizing individual learning based on collective forms in mathematics teaching, ensuring the modification of communication between teacher and student, focusing on the use of a learner-centered approach in education).

According to J. Elmurodov, the following requirements must be followed when creating an open information-educational environment [15]:

- There should be visual and audio materials for each topic;
- The brightness of colors should periodically change;
- The content of visually prepared educational materials should not be too simple or overly complex.

He also notes the following guidelines should be observed:

- Before starting the creation of the open information-educational environment, one must have a clear understanding of its structure;
- The environment should not contain excessive information. Each section should include necessary elements and align with the overall concept of the presentation and serve to reveal it;
- When choosing the symbol style and background color, it is recommended to use ready-made templates;

- Resources should not be overloaded with unnecessary details. Sometimes it is more effective to present several simpler slides instead of one complex slideshow;
- Additional animation effects should be minimized; they should only be used to draw attention to the main points of the presentation;
- Audio and visual effects should not block the core information that needs to be delivered to the learner;
- For each module, the system should provide appropriate presentation formats for learners, including titles, text, images, tables, graphs, audio, video, and other multimedia tools;
- It should also include mechanisms for reinforcing learned knowledge, skills, and competencies, and for establishing feedback with students (e.g., problems, control questions, simulation tasks, methods for analyzing answers, explanations and suggestions for typical mistakes);
- Texts, images, diagrams, tables, and video sequences should be developed in accordance with ergonomic requirements;
- Each module of the lesson should be designed from an ergonomic perspective.

However, their research does not sufficiently justify the requirements for developing digital educational platforms specifically aimed at organizing students' extracurricular learning activities. Therefore, it is necessary to revise the requirements for such platforms with a focus on supporting extracurricular learning.

Requirements Developed During This Research

Based on the theories of the scholars mentioned above, the following requirements were developed during this research for creating

digital educational platforms aimed at organizing extracurricular learning activities for general secondary school students:

1. **Studying existing platforms:** This requirement involves analyzing the capabilities of current digital educational platforms, identifying their strengths and weaknesses. It is especially important to pay attention to user reviews. This helps form an understanding of the potential needs of users.
2. **Developing a concept for the project:** This involves defining the main features, design, and architecture of the digital platform. It includes determining what types of courses will be offered, the usage strategy, and how to attract users. Additionally, it requires specifying the formats of the courses to be created (text, audio, video, etc.).
3. **Requirement to focus on technological solutions when creating the educational platform:** When developing a digital educational platform, it is important to choose modern software tools appropriately. Nowadays, there are many shell programs and ready-made templates available for creating platforms. Almost all popular programming languages are suitable for building digital educational platforms, but the most commonly used ones are PHP, Python, and JavaScript. Learning Management Systems (LMS) such as **Moodle**, **Canvas**, or **Blackboard** offer ready-made solutions that can be adapted to educational needs. Additionally, there are specialized course creation platforms like **Teachable** and **Thinkific**, which allow the creator to develop fully structured courses.
4. **Requirements for Designing the User Interface:** The interface must be intuitive and user-friendly. It is important to design navigation, color schemes, fonts, and other visual aspects of the platform that may affect

perception. Therefore, when creating a digital educational platform, the design must align with color theory principles, as colors can evoke certain moods.

For example:

- Red shades can trigger irritability,
- Soft colors have the opposite effect.
- Orange, yellow, and red are considered **warm colors**,
- Blue and violet are considered **cool colors**.

If the color of objects and background brightness are not chosen correctly, some objects may not be visible at a glance, creating a “dot” effect [15]. To draw attention to images, the visual perception of such objects may require additional visual effort. Therefore, combining different colors is considered effective [16]. Bright and warm colors should be primary; cool colors should serve as secondary. The digital educational platform should take into account the specific features of receiving information from a computer screen. A consistent style should be maintained throughout the lesson. The structure and format of presenting educational materials (such as the user interface, the use of graphic elements, and the creation of lesson templates) should be standardized (unified) [195].

5. **Requirements for the Content:** The course program should be developed to be interesting and useful for the target audience. High-quality content helps attract users and encourages extended use. Collaboration with specialists in specific fields is necessary to create effective educational materials. From this perspective, it is recommended that each module be structured with the following elements:

- A psychological preparation text (module abstract and introduction);

- The learning goals and objectives of the module;
- Educational content and resources;
- A list of key issues and core problems related to the module;
- Self-assessment and reflection questions (with answers, explanations, and recommendations);
- A structural-logical scheme of the module;
- A list of instructional resources and links to websites related to the module topic;
- Special tools to sustain student motivation, focus, and interest;
- The inclusion of summary diagrams for general review;
- Use of consistent visual indicators—such as uniform pictograms—to clearly distinguish various content components;
- Integration of theoretical descriptions with practical examples;
- Additional didactic resources to support independent cognitive activity (e.g., annotated lectures, instructor advice, etc.);
- A linguistically clear, learner-oriented style tailored to the target group;
- Simple and consistent navigation throughout the content;
- Consistent use of standard terminology and symbols;
- A universal reference system including definitions of all objects and relationships used;
- General information about learners' cognitive needs, such as their motivation, age, social status, cultural and professional level, preferred learning style, and prior knowledge.

In addition, it is advisable to follow the requirements proposed by **V.A. Krasilnikova [13]**, which include:

- *Social, scientific, and educational relevance* – ensuring alignment with national and societal goals in preparing students;

- *Practical orientation* – addressing the practical needs of students, particularly those in remote areas;
- *Purpose-driven, systematic, and consistent learning* – defining logical and structured processes in education;
- *Progression from simple to complex* – presenting educational content in a way that gradually increases in complexity for better comprehension;
- *Emphasis on student activity and engagement* – focusing on the learners' role in the educational process;
- *Support for developing core professional competencies* – using individualized approaches in education;
- *Coherence between content complexity and teaching methodology.*

6. Requirements for Assessment and Evaluation: The digital learning platform for organizing students' extracurricular activities must include **online tests** aimed at developing students' logical and creative thinking. These assessments must meet the following criteria: reliability, clarity (comprehensibility), and simplicity.

According to J. Elmurodov, it is essential that tests embedded within the digital platform clearly define the type of mental activity required of the student. If the student is analyzing answer choices based on recognition, discrimination, or classification, then the test assesses familiarity. If the student is expected to construct an answer, recall previously learned material, or solve a new problem before selecting a correct response, the test targets *second- or third-level assimilation*.

The educational diagnostic software tools used to design such online tests should align with modern standards, be suitable for web deployment, and be small in size. Moreover, the tests should offer

multiple-choice questions, with randomized answer sequences for each individual user.

7. **Modularity Requirement (Quantization):** The learning tools of a digital platform designed for students' extracurricular activities should be modular—**small in size** but complete in structure—allowing them to be used individually or combined as needed [14].
8. **Integration Principle:** The digital learning platform for extracurricular activities must organize and tightly interlink subject-specific materials, significantly expand the field of interaction between the teacher and learners, and create a rich communicative environment. Moreover, the platform must include pedagogical tools for instructing, modeling, demonstrating, and monitoring. These tools should enable students to generalize their knowledge, synthesize information, and master universal models for solving problems [194].
9. **Analytics Requirement:** To analyze user activity on the platform, it is necessary to integrate **web-analytic tools**, such as **Google Analytics**. These tools help identify which pages are most and least visited and track overall user engagement.

User Support Requirements: The digital learning platform should include a reliable **support system** to answer questions and solve learners' problems. The platform must feature:

- A feedback form;
- A support chat; or
- A forum section where users can communicate, ask questions, and exchange ideas.

Because users often seek peer interaction, experience sharing, and community support, the platform should also include discussion forums, group discussions, and chat tools.

11. **Support for Organizing Online Clubs:** To make effective use of students' free time and reduce unproductive internet use, the digital learning platform must enable the organization of **online clubs**. These clubs promote in-depth subject learning and provide a focused alternative to less productive online content.
12. **Security Requirements:** The developed digital learning platform must be protected from potential threats and ensure the security of users' personal data as well as the integrity of didactic materials. No unauthorized alterations should be allowed, and all materials must remain safe and secure.

Conclusion

In summary, the article examined the views of scholars regarding the requirements for the creation of digital educational technologies. A detailed review of research conducted in this area by both domestic and foreign scholars was presented. It was found that although these studies address various aspects of educational technology, many of them are focused on higher education institutions or classroom-based education.

In contrast, this article emphasizes the specific needs of general secondary schools, particularly in organizing students' extracurricular learning activities. Based on the analysis, a list of **ten essential requirements** was developed for creating a digital platform suited to these goals. These requirements address not only the technological and structural aspects of the platform but also pedagogical, psychological,

and motivational factors that influence the effectiveness of extracurricular learning.

The outcomes of this research can serve as a foundational guideline for developers, educators, and policymakers involved in designing and implementing digital platforms that enrich students' learning experiences outside the classroom.

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