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**RESEARCH ARTICLE**

# Organizing Independent Learning Activities Based on Digital Technologies

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## Abstract

This article analyzes the theoretical and practical aspects of organizing self-regulated learning (SRL) through digital technologies. The study highlights the main components of SRL, the role of digital learning platforms such as Learning Management Systems (LMS) and Massive Open Online Courses (MOOCs), as well as artificial intelligence-based tools in the educational process. In addition, the impact of blended learning and flipped classroom models on the effectiveness of independent learning is examined. The findings indicate that the digital environment plays a crucial role in developing self-regulated learning skills.

**KEYWORDS**

Self-regulated learning, SRL, digital technologies, LMS, MOOCs, blended learning, metacognition, artificial intelligence.

## INTRODUCTION

In recent years, the processes of digital transformation observed globally have significantly influenced the education system alongside all other sectors of society. As information and communication technologies rapidly develop, the forms of acquiring knowledge, teaching methods, and principles of organizing the educational process are undergoing fundamental changes. The traditional teacher-centered educational model is gradually being replaced by a student-centered, interactive, and flexible learning model. Under such conditions, self-regulated learning (SRL) has emerged as one of the key components of modern education.

In contemporary education systems, 21st-century competencies are gaining particular importance. Among these competencies, metacognitive skills occupy a leading position alongside critical thinking, problem-solving, creativity, and communication skills. Metacognition refers to an individual's ability to understand, monitor, and manage their own thinking processes, and it is considered highly important for effective learning. Research shows that students with well-developed metacognitive skills achieve higher academic outcomes and are capable of independently improving their knowledge [1].

Self-regulated learning (SRL) is regarded as one of the main pedagogical mechanisms for developing these competencies. During the SRL process, students set clear goals, choose appropriate strategies to achieve them, monitor their learning activities, and evaluate the results. Studies conducted by Barry J. Zimmerman and Dale H. Schunk demonstrate that the cyclical SRL model—consisting of planning, performance, and reflection—is an important tool for developing students' self-management skills [2]. This, in turn, ensures not only academic success but also effectiveness in future professional activities.

The rapid development of digital technologies has fundamentally transformed this process and brought self-regulated learning to a new level. The expansion of the internet, the widespread use of mobile devices, and the

emergence of various online learning platforms have significantly broadened opportunities for acquiring knowledge. Today, students are no longer limited to classroom instruction; they can independently learn through online courses, video lectures, virtual laboratories, and interactive platforms. According to the connectivism theory proposed by George Siemens, knowledge in modern education is formed through digital networks, and learners construct knowledge by actively participating in these networks [3]. Consequently, the SRL process becomes more dynamic and interactive.

Digital technologies also make it possible to create flexible and personalized learning environments. For example, through Learning Management System (LMS) platforms, students can independently plan their learning activities, complete assignments, and monitor their results. Artificial intelligence-based systems can recommend individualized learning pathways and create learning environments tailored to each student's needs. This significantly increases the effectiveness of independent learning [4].

Particularly during the global pandemic of 2020–2022, the education system faced serious challenges. Many educational institutions were forced to shift to distance learning within a short period. This situation clearly demonstrated the importance of students' self-regulated learning skills. Studies indicate that students who possessed self-management abilities, effective time management skills, and strong intrinsic motivation achieved higher results in online learning environments. In contrast, students with insufficiently developed self-regulation skills encountered various difficulties during the learning process [3].

From this perspective, developing self-regulated learning has become one of the priority tasks of modern education systems. This process serves not only to provide students with knowledge but also to shape them into independent thinkers capable of managing their own activities and engaging in lifelong learning. Digital technologies play an important supporting role in this process and contribute to improving the quality of education.

Digital technologies support all stages of the SRL process. Through LMS platforms, students can plan their learning activities, complete assignments, and monitor outcomes. Artificial intelligence-based systems analyze students' knowledge levels and recommend personalized learning materials. Screencasts and video lessons enable students to review complex topics repeatedly and achieve deeper understanding.

At the same time, digital technologies have introduced new pedagogical approaches into education. In particular, the implementation of blended learning, flipped classroom, and asynchronous learning models has enabled more effective organization of the educational process. These models strengthen students' independent learning activities and increase their engagement.

However, several challenges related to the use of digital technologies still exist. In some regions, insufficient technical infrastructure, low internet speed, and limited access to digital devices may negatively affect the educational process. Furthermore, students' levels of digital literacy, self-management skills, and motivation are also important factors.

## LITERATURE REVIEW

Self-regulated learning (SRL) is widely studied as one of the most important components of modern education systems. The rapid development of digital technologies has elevated SRL to a new stage and created the need to study it not only from pedagogical but also from technological perspectives. In contemporary scientific literature, SRL is interpreted as a complex process involving learners' conscious management of their educational activities, goal-setting, strategy selection, and evaluation of outcomes.

Modern international studies focus on investigating the effectiveness of SRL in digital environments. For instance, a systematic review conducted by Faza and colleagues identified LMS platforms, MOOCs, artificial intelligence tools, collaborative platforms, and learning analytics systems as the primary technologies supporting SRL [6]. The study scientifically proved that personalized feedback systems and adaptive learning environments significantly strengthen students' independent learning processes.

Empirical studies also confirm the effectiveness of SRL. René F. Kizilcec and colleagues (2017), in their study conducted on MOOCs platforms, found that students using SRL strategies achieved 28% higher results [7].

Research conducted by Maxmudova D.M. and Ergashov N.I. also emphasizes that the development of modern information and communication technologies requires the extensive implementation of multimedia tools, distance learning platforms, interactive software, and video materials in the educational process. Their findings recognize digital learning

platforms as effective tools for organizing independent learning [8].

In a study conducted by Abdul Noori (2025), the role of SRL in language learning was analyzed [9]. The author demonstrated that interactive environments created through Mobile-Assisted Language Learning (MALL) and Computer-Assisted Language Learning (CALL) technologies support students in independently developing their knowledge. According to the research findings, effective use of digital tools increases SRL efficiency by approximately 25–35%. This confirms the growing importance of technology in modern education.

Richard E. Mayer's multimedia learning theory also plays an important role in explaining the theoretical foundations of SRL [10]. According to this theory, the integration of visual, audio, and textual elements in digital educational materials helps learners acquire knowledge more deeply. This enhances students' efficiency in independent learning processes. Similarly, Siemens' connectivism theory explains how knowledge is formed through digital networks and emphasizes the multi-source nature of learning in modern education [11].

The SAMR and TPACK models are also highly important for integrating digital technologies into education [12; 13]. These models explain mechanisms for effectively implementing technologies into the teaching process and fully utilizing their pedagogical potential. Drugova et al. (2021) integrated these models to comprehensively analyze educational innovations [14]. Valtonen et al. (2020) developed updated versions of the TPACK model and expanded its applicability within global educational environments [15]. Alonso Mencía and colleagues (2020) emphasized that research on SRL in MOOCs environments remains insufficient and highlighted the need for further in-depth scientific studies in this field [16].

Research conducted by Makhno (2022) revealed that the level of SRL in online learning environments is 40% higher compared to traditional education [17]. Alanoglu (2025), studying the impact of digital literacy on SRL, proved that increased digital literacy strengthens SRL effectiveness by an average of 22% [18]. These findings demonstrate the importance of digital competencies in the development of SRL.

Contemporary Uzbek scholars are also conducting important research in this direction. For example, R. Ishmuhamedov emphasizes that innovative pedagogical technologies can foster students' independent thinking, while B. Xodjayev demonstrates that integrating modern pedagogical technologies into the educational process can improve the effectiveness of independent learning.

Digital platforms can be categorized into the following groups, each supporting SRL at different levels:

## RESULTS AND DISCUSSION

Organizing self-regulated learning activities through digital technologies consists of the following stages:

1. Planning Stage – Students set personal goals, select resources, and create study plans through LMS platforms. Gamification elements increase motivation at this stage.

2. Implementation Stage – Independent learning activities are carried out through screencasts, interactive quizzes, gamification, and virtual laboratories. AI-based recommendations support students and quickly identify weaknesses.

3. Monitoring Stage – Real-time monitoring is conducted through platform dashboards and learning analytics systems. This enables students to continuously control their own learning processes.

4. Reflection and Improvement Stage – Students use self-assessment, AI feedback, and analysis of their own results to develop future learning plans. Screencasts play an important role at this stage.

## METHODOLOGY

The study employed theoretical analysis, comparative methods, empirical evaluation of platform functionalities, and generalization of international best practices. Empirical data included international surveys involving more than 500 respondents, as well as statistical information from UNESCO, OECD, and the World Bank. The surveys assessed platform usability, SRL effectiveness, and associated challenges.

Digital technologies provide the following advantages:

- Independence from time and place — students can study materials anytime and anywhere.
- Personalized learning trajectories — AI systems provide customized content for each learner.
- Increased student engagement and motivation — through gamification elements such as points, rankings, and badges.

- Development of metacognition — through screencasts and reflection tools that enable students to analyze their own learning processes.
- Inclusive education opportunities — through special tools such as subtitles and text-to-speech systems for students with disabilities.
- Economic efficiency — by reducing the costs of printed educational materials.

Global studies (Faza et al., 2025) prove that students with strong SRL skills demonstrate 25–30% higher performance in digital learning environments. These impacts are supported by detailed examples and are widely applied in global educational practices.

## CONCLUSION

Digital technologies are among the most effective tools for adapting self-regulated learning activities to modern educational requirements. They improve educational quality, provide personalization, foster metacognition, increase efficiency, and prepare younger generations for the demands of the digital society. However, success depends not only on technical tools but also on updating pedagogical approaches, training teachers, and developing educational infrastructure. Global experiences provide valuable lessons in this direction and contribute to modernizing education systems worldwide.

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