

**DIGITAL TECHNOLOGIES AND PEDAGOGICAL SOFTWARE TOOLS IN
DEVELOPING FREELANCER SKILLS: CAPABILITIES AND OPPORTUNITIES**

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ABSTRACT

This article analyzes the capabilities of digital technologies and pedagogical software tools in developing freelancer skills. In the context of the transformation of the modern labor market, the growing popularity of self-employment (freelancing) poses new challenges for the education system. The study examines the pedagogical potential of information-educational environments, artificial intelligence-based platforms, extended reality (XR) technologies, and "Do-It-Yourself" (DIY) educational models in forming freelance competencies. Additionally, the necessary pedagogical conditions for developing freelancer skills among students are systematized.

Keywords: freelancing, digital technologies, pedagogical software tools, information-educational environment, artificial intelligence, extended reality, DIY education, competencies.

INTRODUCTION

The labor market of the 21st century is undergoing fundamental changes. Traditional employment models are being replaced by flexible, individualized formats - particularly freelancing. Freelancing, as a form of self-employment, is not only a type of economic activity but also a form of professional activity requiring a set of special competencies[1].

The development of the digital economy and platform-based employment has dramatically increased the demand for specialists with freelancing skills. This places an important task before the education system – the need to equip students not only with traditional professional knowledge but also with competencies such as organizing independent work activities, effectively communicating with clients, and being able to offer their services in the market[7].

Modern pedagogical software tools and digital technologies have great potential in developing freelancing skills. The purpose of this article is to systematically analyze the capabilities of digital technologies and pedagogical software tools in forming freelance competencies and to identify the pedagogical conditions for their integration into the educational process.

**1. THE CONCEPT OF FREELANCE COMPETENCIES AND PEDAGOGICAL
CONDITIONS FOR THEIR DEVELOPMENT**

Freelance skills refer to a specialist's ability to effectively organize independent work activities. These skills are divided into two main groups: professional (hard skills) and personal (soft skills) competencies. Professional competencies include knowledge and skills in a specific field (e.g., web design, programming, copywriting), while personal competencies encompass skills such as time management, communication abilities, self-organization, and financial literacy[1].

Pedagogical literature provides various definitions of the concept of "pedagogical conditions." According to S.I. Ozhegov's explanatory dictionary, pedagogical conditions are a set of pedagogical and psychological factors and components (relationships, tools, etc.) that ensure the implementation

of the pedagogical process[1]. According to N. Ippolitova and N. Sterkhova's definition, pedagogical conditions are one of the structural components of the pedagogical system, reflecting the totality of educational environment opportunities and ensuring the effective functioning and development of this system[1].

The use of information-educational environments in forming freelancing skills requires the following pedagogical conditions[1]:

1. **Clear educational goals** – it is necessary to define clear educational goals before introducing information-educational environments. Teachers should determine what students will achieve through these environments.
2. **Technological infrastructure** – educational institutions must have reliable and robust technological infrastructure to fully utilize information-educational environments.
3. **Teacher professional development** – effective use of information-educational environments depends on teachers' digital literacy skills. They need to be able to manage the chosen environment, understand its features and functionality, and seamlessly integrate it into educational practice.
4. **Student readiness and digital literacy** – like teachers, students must be ready to use digital tools and have digital literacy skills.
5. **Supportive learning environment** – the use of information-educational environments should be organically integrated into the learning process. Teachers should design activities that develop collaboration, engagement, and critical thinking among students.
6. **Assessment and feedback strategies** – effective assessment strategies for evaluating student knowledge using information-educational environments must be developed. Adapting traditional assessment methods to the digital nature of these environments is advisable.
7. **Ethical and safe use of technology** – issues of digital citizenship, personal data security, and online responsible behavior are important pedagogical conditions.

Research shows that the effectiveness of forming students' freelance competencies increases by 9.2% when the educational process is organized in compliance with these pedagogical conditions[1].

2. CAPABILITIES OF DIGITAL TECHNOLOGIES IN DEVELOPING FREELANCE SKILLS

2.1. Artificial Intelligence-Based Educational Platforms

In recent years, the introduction of artificial intelligence (AI) technologies into education has created new opportunities for developing freelance skills. AI-based platforms enable individualizing the learning process, providing real-time feedback, and tracking student progress.

The Lingio platform is an innovative educational platform designed to quickly and effectively train company employees using AI technologies. The platform creates interactive courses using AI and provides employees with training in workplace-related language, soft skills, and work processes. Lingio uses natural language processing (NLP) and AI technologies to create comprehensible content and offers personalized learning paths tailored to individual skill levels and roles[5].

The LIVRESQ platform is an authoring tool that allows teachers and trainers to create e-learning content. The platform incorporates OpenAI GPT-4o artificial intelligence technology, helping users create high-quality educational materials quickly and easily. Projects created through LIVRESQ can be used on any computer, tablet, or smartphone[5].

The Dodona platform is an intelligent tutoring system designed for learning programming, statistics, and data science. The platform serves to help students learn better, teachers teach more effectively,

and increase the effectiveness of educational technologies by providing real-time data and feedback[9]. Dodona can be used as a virtual co-teacher to support active learning and challenge-based education in open and collaborative learning environments .

2.2. Extended Reality (XR) Technologies

Extended reality (XR) technologies, including virtual reality (VR) and augmented reality (AR), are creating revolutionary changes in developing freelance skills. The XR Library Premium platform developed by EON Reality offers a specialized module focused on income generation and market skills development[2].

This platform provides immersive learning experiences in four main areas[2]:

1. **Freelancing and Gig Economy Success** – teaches working on platforms such as Upwork, Fiverr, and Toptal. Modules cover contract negotiation, portfolio creation, and client management. Students practice in XR role-playing games with avatar-clients, developing communication and deal-making abilities.
2. **Consulting and Professional Services** – prepares specialists to transform their expertise into consulting services demanded by retainers ranging from \$5K-\$15K. Includes immersive case-study simulations on presenting strategies and refining value propositions before virtual "leaders."
3. **Digital Content Creation and Monetization** – focuses on YouTube, TikTok, Instagram, and podcast monetization strategies. XR scenarios replicate production studios where students learn camera angles, script writing, and analytics.
4. **E-commerce and Online Business Development** – prepares for creating and scaling Shopify and Amazon stores. XR training simulates digital store creation, advertising campaign optimization, and logistics planning.

The advantage of XR technologies is that they allow students to learn from mistakes and gain practical experience by simulating real work environments. Unlike traditional PDF or video tutorials, in XR environments, students experience real situations and acquire valuable practical skills[2].

2.3. Platform-Based Education and "Do-It-Yourself" (DIY) Approach

The development of digital technologies has brought fundamental changes to the educational process. According to research by K. Bhatia and colleagues, platform-based education, user-generated educational resources, and peer communication and collaboration networks enable the "Do-It-Yourself" (DIY) educational model[4],[10].

The researchers interviewed 16 young digital designers (graphic designers and UX designers) working or wanting to work in the gig economy in Delhi, Mumbai, and Bangalore, India. The results showed a significant gap between the rigidity of formal education and the future of work in the gig economy[4],[10].

Young freelancers design their educational experiences in the following ways[4]:

- **Learning platforms** – using open platforms such as YouTube, Udemy, Coursera;
- **User-generated content** – using educational materials created by peers and experts;
- **Peer networks** – knowledge sharing through communication and collaboration with colleagues;
- **AI tools** – using AI tools for summarizing information, creating tests, and obtaining explanations[8].

According to information presented in the DigitalScale webinar, freelancers can design effective learning paths using YouTube, Udemy, and MOOC platforms, as well as AI tools. Participants learn

methods for selecting quality content, organizing playlists and courses, obtaining summaries, tests, and explanations with AI help, and tracking their progress over time[8].

3. CLASSIFICATION OF PEDAGOGICAL SOFTWARE TOOLS AND THEIR CAPABILITIES

Pedagogical software tools used in developing freelance skills can be divided into the following groups:

3.1. Learning Management Systems (LMS)

Learning management systems enable organizing, managing, and monitoring the educational process. The Travor platform, as a cloud-based LMS, simplifies team onboarding and creates a resource hub for all teams. The platform offers accessibility from Windows, Mac, Android, and iOS mobile devices, tracks candidates during the hiring process, develops learning plans for teams, assigns pre-interview tests, and provides product knowledge for service and sales teams[5].

The Northpass platform is a cloud-based LMS designed for modern teams, enabling businesses to deliver training to their workforce, customers, and partners. The platform features a modern, learner-optimized interface and includes a suite of tools for creating online courses, delivering engaging content, and tracking learner progress[5].

3.2. Authoring Tools and Content Creation Platforms

Authoring tools allow teachers and trainers to create their own e-learning content. Easygenerator is an intelligent cloud-based e-learning software solution that enables users to create engaging courses in the cloud without requiring coding and installation. Using the platform, users can focus on content and achieve the best learning outcomes through goal setting and assessment[5].

The iQualify LMS platform enables organizations and educational institutions to create and sell engaging and inspiring courses. The platform features flexible authoring tools for organizing, rearranging, editing, or repurposing content, rich media and interactive content for enhanced learning experiences, assessment activities, social learning, and more[5].

3.3. Adaptive Learning Platforms

Adaptive learning platforms provide learning experiences tailored to individual learner characteristics. The Seturon platform is a next-generation adaptive learning platform designed to deliver personalized and engaging learning experiences across devices. The platform's mobile-first approach ensures convenience and accessibility for learners requiring "just-in-time learning" or those learning on the go[5].

The adaptive course editor allows creating a single course tailored to students with different experience levels, learning paces, and interests, saving time, increasing engagement, and reducing dropout rates. Seturon supports interactive content with long reads, videos, and various test types[5].

4. ONLINE TUTORING AND PEDAGOGICAL PRACTICES

Online tutoring is an important direction in developing freelance skills. Research conducted by A. Parker examined the pedagogical practices and digital tools of online tutors working with K-5 grade students[6]. The research identified five main themes:

- 1. K-5 Online Tutors as Educational Entrepreneurs** – online tutors organize their activities as entrepreneurship, creating their brands and forming client bases.
- 2. Benefits of Being a K-5 Online Tutor Entrepreneur** – independent work schedule, absence of geographical constraints, opportunity to work with diverse clients.

3. Challenges of Being a K-5 Online Tutor Entrepreneur – ensuring stable income, finding clients, dealing with competition.

4. Pedagogical Practices of Online Tutors – adapting to individual student needs, using interactive methods, increasing motivation.

5. Use of Digital Tools to Improve Online Tutoring – using video conferencing platforms, interactive whiteboards, educational applications, and gamified tools[6].

The research shows that online tutors need to have entrepreneurial skills and effectively use modern digital tools. This is an integral part of freelance skills.

5. SPECIALIZED FREELANCE PLATFORMS FOR STUDENTS

In recent years, specialized freelance platforms designed for students have emerged. The student skills sharing and freelancing platform developed by M. Haruna addresses students' academic and professional development needs using digital technologies[7].

The platform provides students with the following opportunities[7]:

- Showcase their expertise;
- Bid to participate in projects;
- Collaborate securely within the academic ecosystem.

This platform was created in response to the obsolescence of traditional skill-sharing methods and aligns with trends in digital entrepreneurship and decentralized education. The platform enables students to capitalize on their skills while reflecting the broader movement toward technology-based education[7].

6. DISCUSSION

Digital technologies and pedagogical software tools open wide opportunities for developing freelance skills. Artificial intelligence-based platforms enable individualizing the learning process and providing real-time feedback, while extended reality technologies allow practical experience accumulation through simulating real work environments[2],[9].

"Platform-based education" and the "Do-It-Yourself" approach enable students to independently design their educational paths[4],[10]. This forms an essential component of freelance skills – the ability for independent learning and self-development.

The diversity of pedagogical software tools (LMS, authoring tools, adaptive learning platforms) provides teachers and students with a comprehensive toolkit for effectively organizing the educational process[5].

At the same time, using information-educational environments in developing freelance skills requires compliance with specific pedagogical conditions[1]. Factors such as technological infrastructure, digital literacy of teachers and students, supportive learning environment, assessment strategies, and ethical use of technology are key to a successful educational process.

CONCLUSION

Digital technologies and pedagogical software tools play an important role in developing freelance skills. Artificial intelligence, extended reality, platform-based education, and adaptive learning technologies create extensive opportunities for enhancing students' readiness for independent work activities.

Using information-educational environments in developing freelance skills requires the following pedagogical conditions: clear educational goals, technological infrastructure, teacher professional

development, student digital literacy, supportive learning environment, effective assessment strategies, and ethical use of technology.

In the future, educational institutions need to create specialized educational programs and platforms focused on developing freelance skills, as well as widely integrate existing pedagogical software tools into the educational process. This, in turn, will serve to increase students' competitiveness in the labor market and prepare them for modern professional activities.

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