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Evaluating the Effectiveness of E-Learning Through SWOT Analysis

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Abstract: E-learning is a key element in modern teaching methods and techniques. The quality and properties of e-resources, materials used and information platforms for e-learning can significantly have an impact on the entire learning process. Therefore, it is important to investigate and analyze the effectiveness and problems facing e-learning. This study aims to assess the effectiveness of e-learning in higher education, using SWOT analysis as a tool for strategic evaluation. The analysis gives an assessment of the strengths and weaknesses of the process, which allows to define good practices and guidelines for improving e-learning processes. The study is based on a combination of analysis of scientific literature and an online survey conducted among 32 school and university professors. The analysis of the scientific literature covers research in the field of e-learning, for a period of the last 6 years. The survey includes questions related to the applicability, effectiveness and problems of e-learning. The results show that e-learning provides high flexibility, accessibility and the opportunity to individualize the learning process, but faces challenges related to learner motivation, limited social interaction and technological barriers. Based on the analysis, strategic measures are proposed to increase the efficiency and sustainability of the e-learning environment.

Keywords: E-learning, Online learning, SWOT analysis, Learning strategies

Introduction

E-learning is part of our vision of a modern and innovative educational environment. It is an integral part of the education of children and adults in various fields of knowledge and forms of learning around the world (Imran, 2024). The development of information and communication technologies has led to the emergence of innovative platforms that provide educational content without geographical and time restrictions (Jain, 2024). Research on the topic worldwide has increased several times after 2020. Despite its advantages, the e-learning model is the subject of discussions regarding its effectiveness, especially in higher education, where traditional methods still dominate (Hakimi, 2024).

Research on the topic points to 2020 as a crucial year for e-learning, due to COVID-19 and the shift to remote forms of work and learning around the world (Abdelfattah, 2024). As a result of remote learning, questions arose about the methods and technologies of teaching, learning and testing (Dritsas, 2025). Then the question of the legitimacy of the results of exams conducted in an electronic environment was raised. This led to a large number of studies on the effectiveness of e-learning after this period (Castro, 2021).

A number of studies focus on the role of teachers and lecturers in achieving educational goals during e-learning (Erila, 2021; Tomczyk, 2021). As the learning environment changes (from a classroom to a virtual classroom),

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the role of the teacher also changes. This requires increasing the competence of teachers and improving their digital competence in particular. This skill is defined as key to the effectiveness of e-learning (Basantes-Andrade, 2022).

SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is one of the oldest and most widely adopted strategic tools worldwide. The creator of the original SOFT/SWOT approach is Robert Franklin Stewart. Designed as a tool in one of the earliest strategic planning frameworks, called the System of Plans, SOFT was used in a carefully designed process in which all managers of the company participate in long-term organizational planning (Benzaghta, 2021).

Although SWOT analysis is often criticized in academic circles, in our opinion, it is a very appropriate tool for assessing the effectiveness of e-learning. It will help us identify what works well, where there is a need for improvement, and what external factors can affect the success of e-learning. The results of the SWOT analysis will provide us with valuable information and a clear basis for making strategic decisions regarding the development and improvement of e-learning. This study applies SWOT analysis to provide a comprehensive assessment of e-learning and to propose specific guidelines for its improvement.

The aim of the study is to assess the effectiveness of e-learning through a SWOT analysis in order to identify the key factors influencing its implementation in the university environment. To identify the strengths and weaknesses of e-learning, as well as the opportunities and threats arising from the external environment, in order to formulate strategies to increase the effectiveness of e-learning.

Research Questions are derived from the four dimensions of the SWOT analysis:

- What are the main strengths of e-learning in higher education?
- What are its main weaknesses that limit effectiveness?
- What opportunities do technological developments and the market environment offer?
- What threats arise from the dynamics of the external environment?

Methodology

This study aims to apply a large-scale approach, which includes a review of scientific publications on the topic of SWOT analysis and conducting an independent study based on an online survey. The results obtained will show the trends in the development of e-education, as well as the current results of SWOT analyses conducted in recent years. The independent study covers a survey of teachers in Bulgaria and will show the state of e-learning in the country. Thus, the results of two SWOT analyses will be compared and the direction of development of e-education in Bulgaria will be presented, in relation to world research.

Literature analysis (for theoretical SWOT)

Includes a review of 20 scientific publications. The search for publications is in Google Scholar and Scopus. Keywords such as SWOT analysis, e-learning, online learning, online teaching are used. The selection of articles is based on a full SWOT analysis, presented in the corresponding table. All selected publications present such an analysis. The criterion for the publication period is 2019-2025.

The analysis includes selecting the results of a SWOT analysis in each publication. Searching for matches for each category of SWOT analysis. Selecting the most common features for each category, with the criterion being at least 3 or more occurrences. Developing a summarized SWOT analysis with the most common strengths and weaknesses, opportunities and challenges for e-learning.

Survey (for empirical SWOT)

Includes a survey of teachers in schools and universities who teach or have experience with teaching in an electronic environment. The survey is through an online form that is specially developed for the purposes of this study. The survey contains 36 questions divided into 8 sections.

- Introductory and organizational questions;

- Learning content and design;
- Technologies and platforms;
- Interaction and communication;
- Assessment;
- Engagement and motivation;
- Accessibility and inclusion;
- Closing questions.

The selection of questions is in accordance with the four categories of SWOT analysis and e-learning. In addition, the questions cover all aspects of the learning process as a whole, from organizing and conducting classes to testing and evaluation. As a result of the completed surveys, the answers will be extracted according to the SWOT categories, after which the most common signs for each category will be selected. The criterion for selecting a sign to be included in the analysis results is 2 occurrences.

Building a Strategic Matrix

The strategic matrix presents ideas for strengthening strengths and reducing weaknesses, by using opportunities or preventing threats. The scheme in Table 1 was used to compile the strategies. Approaches are proposed in the following combinations: Strength/Opportunity, Weakness/Opportunity, Strength/Thread, Weakness/Thread. The purpose of the strategic framework is to propose future solutions for improving e-learning, according to the identified strengths and weaknesses, opportunities and threats from the SWOT analysis.

Table 1. SWOT levels (Source: Karatop, 2015)

	STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
STRENGTH	To strengthen the strengths	Strengthen weaknesses by using strengths	Take advantage of opportunities using strengths	Turning threats into opportunities using strengths or neutralising threats
WEAKNESS			Strengthen weaknesses by using opportunities	To strengthen weaknesses in order to resist threats
OPPORTUNITY			Take advantage of all opportunities using opportunities	Turning threats into opportunities using opportunities or neutralising threats
THREAT				

Results and Discussion

Analysis of Scientific Literature

Figure 1 shows a summarized result of a SWOT analysis, based on a study of scientific literature using the described methodology. The summarized SWOT analysis presents a sample of the most common characteristics of the four elements of SWOT. The selected publications for SWOT analysis can be divided into three categories, with each category being accompanied by a list of publications categorized within it:

- General research in e-learning and online learning: (Puyt, 2023, Nohwir, 2022; Safonov, 2021,;Vladeva, 2023; Göksün, 2020; Lee, 2021; Aksoy, 2022; Pires, 2023; Rashidova, 2024; Topuz, 2021; Safonov, 2021);
- Research in different regions/countries: (Borkar, 2020; Mardika, 2020; Rochina- Chisag, 2022; Asomah, 2022; Alfiandri, 2021; Ali, 2019);
- Research in Massive Open Online Courses (MOOCs): (Ashilova, 2024; Karatop, 2022;Albelbısı, 2022).

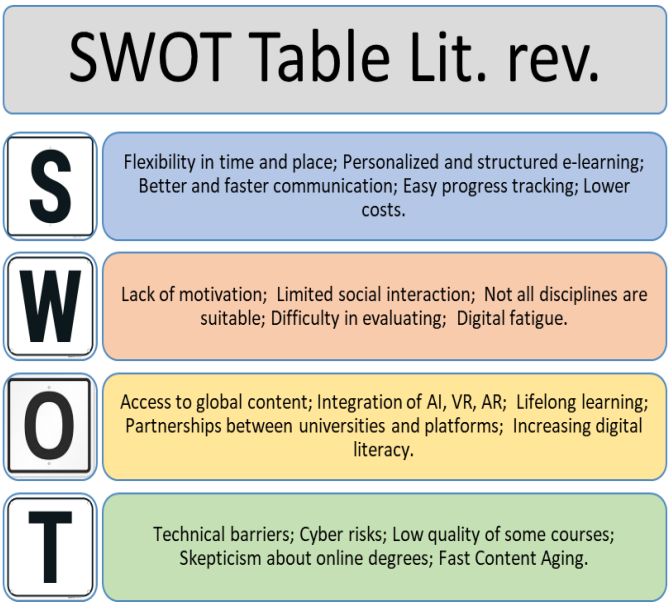

Figure 1. Results of SWOT analysis by literature analysis.

Analysis of the Online Survey

The survey was conducted online from August to November 2025, among 32 teachers, of which 24 were university and 8 were school teachers. All teachers are active and teach both on-site and via e-learning. After summarizing the responses of the respondents, we obtained the following results:

- **Strengths –** Internal Positive Factors Data shows that educators highly value the flexibility and accessibility of e-learning:
  - **Flexibility:** The absolute majority (94%) agree or strongly agree that e-learning offers flexibility in terms of time and place.
  - **Accessibility to resources:** 90% agree/strongly agree that e-learning provides easy access to learning materials at any time.
  - **Development of digital skills:** 90% agree/strongly agree that e-learning improves the digital skills of both educators and learners.

- **Weaknesses –** Internal negative factors The results indicate serious problems in the engagement and social aspect of learning:
  - **Engagement and motivation:** 54% of teachers disagree or somewhat disagree with the statement that e-learning increases the motivation of learners.
  - **Social isolation and contact:** 84% believe that e-learning reduces personal contact and leads to social isolation.
  - **Technical support:** About 28% disagree or somewhat disagree that they receive adequate technical support.

- **Opportunities –** External positive factorsThe questions about innovation and investment show potential areas for development:
  - **Investment in technology:** 92% believe that the institution should invest more in modern e-learning technologies. This is a clear signal of the need to improve the infrastructure.
  - **Professional development:** A high percentage (about 86%) agree that more training is needed for teachers in the use of new tools and methods.
  - **Introducing blended learning:** This is an implicit opportunity – if the biggest problem is the lack of contact, combining flexibility (a strength) with traditional presence (a solution to a weakness) is an obvious next step.

- **Threats –** External Negative Factors Assessment and Integrity Issues Pose the Biggest Risk:
  - **Assessment Violation (Cheating):** The biggest threat is related to assessment – 86% of teachers are highly concerned about assessment violations and cheating during online exams/tests.
  - **Teacher Overload:** 76% of teachers agree that e-learning increases their workload. This leads to a risk of burnout and a potential reduction in teaching quality.

The SWOT analysis table from the survey is presented in Figure 2. It includes all answers with over 60% of the total share.

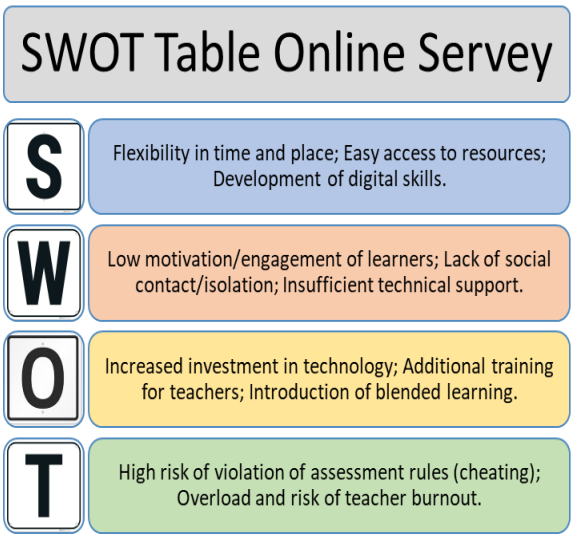

Figure 2. Results of SWOT analysis by the online survey.

Formulation of a Strategic Matrix and Recommendations

Formulating scientific research through SWOT analysis implies its use not simply as a table of factors, but as a methodological framework upon which research questions, objectives, and analysis are built. Based on the SWOT results, we propose the following strategies for improving e-learning.

- Taking advantage of opportunities for development (O/S)
  - Recommendation: Establish an e-Learning Support Center to address training and technical support needs.
  - Action:
    - Continuous training: Develop mandatory and modular courses for teachers focused on pedagogical aspects of online teaching (e.g. how to increase motivation online).
    - Technical support: Hire more technical staff or set up a "Hotline" for quick assistance to teachers to improve their satisfaction.

- Overcoming the lack of contact and engagement (S/W)
  - Recommendation: Implement the Blended learning model as a basic standard to maintain flexibility but bring back human interaction.
  - Action:
    - Define a hybrid format: Clearly define which classes/activities must be in-person (for discussions, labs, socialization) and which can remain online (lectures, readings, tests).
    - Social tools: Train instructors on how to use forums, groups, and video conferencing to encourage active interaction and group work.

- Addressing the Biggest Risk: Assessment and Integrity (W/T)
  - Recommendation: Implement standardized, proctoring software solutions or alternative assessment methods that do not rely solely on tests.
  - Action:
    - Assessment Diversification: Shift to projects, case studies, essays, and oral exams (online), which require higher-level thinking and are more difficult to copy.
    - Invest in Software: Provide centralized proctoring software for key exams.

- Engagement and Motivation Strategy (W/O)
  - Recommendation: Use targeted training for teachers to implement innovative pedagogical methods (such as gamification and interactive tools) that increase motivation and engagement.
  - Action:

- Create a mandatory training module "Designing an Engaging Online Course", focused on creating interactive content, short formats (microlearning) and active feedback methods that produce results with younger and more absent-minded learners."

Table 2. Results of the comparison between theoretical and practical SWOT analysis

	Common Signs	Different Signs
S	Flexibility, Easy Access to Resources.	Practice: Developing digital skills and self-directed learning. Theory: Saving money and wide reach.
W	Technical Problems, Lack of Support.	Practice: Social isolation and lack of motivation. Theory: High initial costs and need for qualification.
O	Hybrid Models, AI Integration.	Practice: Need for Investment and Training (W's response). Theory: Development of flexible policies.
T	Violation of the Rules in Evaluation, Rapid Technological Changes.	Practice: Teacher Burnout. Theory: Data Privacy and Digital Divide.

Discussion

The comparison of the results of the two SLOT analyses is presented in Table 2. For each component of the SLOT analysis, we have common and different features. In terms of strengths, the common features are flexibility and access to resources as the main confirmed strengths. The different features are as follows: the literature analysis emphasizes the scope and savings of funds (organizational focus), while the survey emphasizes the development of digital skills and self-directed learning (pedagogical focus).

In terms of weaknesses, the common features are technical problems and the lack of adequate support, confirmed in both sources. The different features are respectively: the theory focuses on financial costs and staff training, while the practice categorically points to social isolation and low motivation as the biggest weaknesses. The comparison of the opportunities shows that hybrid models and AI integration are recognized as major future opportunities in both sources. The different features are: the survey clearly shows that teachers see the need for investment and their own training as a key opportunity, which is a reaction to the weaknesses (W). The theory is more focused on developing flexible policies. Issues with transcription/honesty and rapid technological change are universally recognized as major threats. The different signs regarding threats are the survey finds one critical internal threat: faculty overload, which is a direct result of daily work. The theory emphasizes more legal and social risks (privacy, digital divide).

Conclusion

The results show that the strengths of the e-learning environment outweigh its weaknesses, but its sustainable development depends on effective management of threats and use of available opportunities. Particular attention should be paid to student motivation, the provision of technical support and the integration of new technologies to compensate for the lack of social interaction. The survey study (Practice) adds a strong social and personal element to the analysis that is missing in the theory: isolation, low motivation and overload. It confirms that the biggest challenge is not technological, but human and pedagogical. The SWOT analysis showed that e-learning has the potential to be not only effective, but also a strategically significant model in higher education, if combined with adequate support for learners and continuous technological updating.

Recommendations

- Development of hybrid models combining online and face-to-face elements.
- Investing in interactive technologies (simulations, VR) and active use of Artificial Intelligence as an auxiliary tool.
- Increasing the digital competence of teachers.
- Regularly updating content.
- Creating online communities for social support.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in EPESS journal belongs to the authors.

Conflict of Interest

* The authors declare that they have no conflicts of interest

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