THE EFFECTIVENESS AND CHALLENGES OF AUTOPROCTORING TECHNOLOGIES AS A TOOL FOR ENSURING ACADEMIC TRANSPARENCY IN DISTANCE EDUCATION

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Abstract:

This research studies the effectiveness and challenges of autoproctoring technologies used to ensure academic integrity in distance education. With the transition to distance learning models during the COVID-19 pandemic, the issue of ensuring academic honesty became even more pressing. According to research results, although modern autoproctoring systems demonstrate high effectiveness in maintaining academic integrity, there are a number of technological, legal, psychological, and pedagogical challenges. It has been determined that balancing the technological capabilities of autoproctoring systems with pedagogical approaches is the most effective way to increase academic transparency in distance education.

Keywords: distance education, autoproctoring, academic integrity, online assessment, monitoring systems, personal data security

Introduction

The development of digital technologies has radically transformed the field of education, especially with the transition to distance learning models during the COVID-19 pandemic. While distance education models have provided new opportunities for learning, they have also brought about a number of challenges related to maintaining academic integrity [1]. In this situation, autoproctoring technologies began to be applied as an important tool for ensuring academic honesty in remote assessment processes.

Autoproctoring (automated proctoring) systems are software solutions designed to detect academic misconduct by monitoring and analyzing students' behavior during exams using artificial intelligence, machine learning algorithms, and computer vision technologies [2]. These systems track students' facial expressions, eye movements, the environment, background noise, keyboard and mouse movements through a webcam, and often also record the screen.

Academic honesty is a fundamental component of the educational process, ensuring the reliability and authenticity of knowledge assessment, as well as maintaining ethical norms in scientific activities. In distance education, the issue of academic honesty becomes even more critical since the physical distance between teacher and student makes it more difficult to control academic misconduct.

The aim of this study is to conduct a comprehensive analysis of the effectiveness and challenges of autoproctoring technologies in maintaining academic honesty in distance education. The study examines various autoproctoring systems, their technological capabilities, effectiveness, as well as the legal, ethical, and pedagogical problems encountered in their use.

1. Literature Review

2. The analysis of scientific literature on autoproctoring technologies and their use in education shows that research in this field is developing along several directions.

3. **Technical Aspects of Autoproctoring Technologies**

Autoproctoring systems are based on a variety of technological approaches, including artificial intelligence, machine vision, facial expression analysis, eye tracking, and screen monitoring technologies [3]. While the first automated monitoring systems mainly carried out supervision via webcams, modern systems have significantly increased their accuracy in detecting academic misconduct by analyzing multimodal data [4].

4. Li and colleagues [5] demonstrated in their research that modern autoproctoring systems not only analyze facial movements but also track sitting posture, suspicious objects in the environment, background noise, browser activity, and typing patterns, thereby increasing the effectiveness of detecting academic violations.

5. **Effectiveness of Autoproctoring Systems**

The literature review shows mixed results regarding the effectiveness of autoproctoring systems. Several studies emphasize that the use of autoproctoring technologies provides positive results in maintaining academic honesty [6]. For example, according to a study conducted by Guangul and colleagues [7], the application of autoproctoring systems in assessment processes reduced plagiarism and other academic misconduct by 42–67%.

6. However, other studies point out the limitations of autoproctoring systems in maintaining academic integrity. In particular, Dawson [8] highlights that autoproctoring technologies mainly focus on detecting suspicious behaviors, but such behaviors are not always actual academic misconduct. Therefore, the “false positive” rate can be high.

Psychological and Pedagogical Aspects

The use of autoproctoring systems can impact students’ psychological states. According to Cooper and colleagues [11], students monitored under autoproctoring supervision may experience high levels of stress and anxiety, which can negatively affect their exam performance.

In addition, the pedagogical effectiveness of autoproctoring systems is also an important consideration. Excessive reliance on autoproctoring technologies during online assessment can undermine trust-based relationships between teachers and students [12].

Problems of Autoproctoring Systems

The results of the study show that the use of autoproctoring systems raises the following main problems:

- **Technological problems.** Most of the autoproctoring systems examined (69%) are sensitive to students’ internet speed and device characteristics, which can lead to “false positive” errors caused by technical failures [13]. 62% of students noted that they had experienced at least one technical problem while using autoproctoring systems.

In addition, there is the problem of unequal performance of autoproctoring systems for students from different socio-demographic groups. Research results show that some artificial intelligence-based autoproctoring systems may have different levels of accuracy in identifying students of various races and genders [14]. This can violate fairness principles and result in unjust treatment of certain student groups.

- **Legal and ethical problems.** 74% of students participating in the study expressed concerns about the security of their personal data through autoproctoring systems. 58% of

teachers also noted that data protection legislation requirements are not fully observed when using these systems [15].

Moreover, the excessive intrusion of autoproctoring systems into students' private lives (for example, monitoring their home environment or requiring microphone activation) creates ethical problems. 68% of students indicated that this limits their personal rights.

• **Psychological and pedagogical problems.** The research results confirm that the use of autoproctoring systems significantly affects students' psychological states. 81% of surveyed students reported feeling high levels of stress and anxiety under autoproctoring supervision [16], which can negatively influence their exam outcomes.

Interview results also revealed that the application of autoproctoring systems affects trust-based relationships between teachers and students. 45% of teachers noted that excessive use of autoproctoring systems could damage mutual trust with students [17].

Directions for Improving Autoproctoring Systems

Based on the research results, the following directions are proposed to improve autoproctoring systems and enhance their effectiveness:

• **Technological improvements**

○ Improve the algorithms and artificial intelligence models of autoproctoring systems to ensure equal performance for users from different demographic groups [18].

○ Increase the accuracy of machine learning algorithms to reduce "false positive" results.

○ Develop optimal solutions that can function independently of internet speed and device characteristics.

• **Legal and ethical improvements**

○ Develop mechanisms to fully comply with data protection legislation when using autoproctoring systems [19].

○ Implement data encryption and secure data storage systems to ensure the safety of students' personal information.

○ Optimize the amount of data collected by autoproctoring systems, gathering only what is strictly necessary.

• **Pedagogical improvements**

○ Ensure a balance between autoproctoring technologies and pedagogical approaches [20].

○ Consider students' psychological conditions and develop mechanisms to reduce stress factors when applying autoproctoring systems.

Along with autoproctoring technologies, use other pedagogical methods aimed at ensuring academic honesty (for example, open-book exams, project-based assessments, portfolios).

Conclusion

According to the results of this research, autoproctoring technologies play an important role in ensuring academic honesty in distance education and demonstrate high effectiveness in detecting and preventing academic misconduct. However, the use of these technologies brings about a number of technical, legal, ethical, and pedagogical problems.

For the effective use of autoproctoring systems, it is necessary to ensure a balance between technological capabilities and pedagogical approaches, to protect students' personal data, and to take psychological factors into account. In addition, it is recommended to apply

other pedagogical methods aimed at maintaining academic integrity together with autoproctoring technologies.

In the future, autoproctoring technologies are expected to improve further through advances in artificial intelligence and machine learning. However, when using these technologies, the human factor and pedagogical principles must always remain a priority.

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