REMOTE LEARNING ASSESSMENT METHODS IMPLEMENTED DURING COVID-19: A COMPREHENSIVE REVIEW

MÉTODOS DE AVALIAÇÃO DE APRENDIZAGEM REMOTA IMPLEMENTADOS DURANTE A COVID-19: UMA REVISÃO ABRANGENTE

MÉTODOS DE EVALUACIÓN DEL APRENDIZAJE A DISTANCIA IMPLEMENTADOS DURANTE LA COVID-19: UNA REVISIÓN INTEGRAL

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ABSTRACT: The purpose of the article is to analyze the assessment methods used by universities to evaluate the knowledge gained by students during remote learning amidst the COVID-19 pandemic. Authors have drawn insights from scientific articles and reports to understand the efficiency and effectiveness of these methods, considering the emergency restrictions in place. According to the study findings, the frequently utilized tools for administering online tests were teacher-student remote sessions via Zoom and test administration through Moodle. It is concluded, that as remote learning continues to gain popularity, universities must recognize the importance of maintaining academic integrity. Online assessments offer various benefits, including enhanced flexibility, accessibility, and cost-effectiveness, making them a viable substitute for traditional classroom assessments, particularly in situations where face-to-face interactions are impossible.

KEYWORDS: Remote learning. Assessment methods. COVID-19. Online education.

RESUMO: *O objetivo do artigo é analisar os métodos avaliativos utilizados pelas universidades para avaliar o conhecimento adquirido pelos alunos durante o ensino a distância em meio à pandemia do COVID-19. Os autores extraíram insights de artigos e relatórios científicos para entender a eficiência e eficácia desses métodos, considerando as restrições de emergência em vigor. De acordo com os resultados do estudo, as ferramentas mais utilizadas para administrar testes on-line foram as sessões remotas professor-aluno via Zoom e a administração de testes por meio do Moodle. Conclui-se que, como o aprendizado remoto continua ganhando popularidade, as universidades devem reconhecer a importância de manter a integridade acadêmica. As avaliações on-line oferecem vários benefícios, incluindo maior flexibilidade, acessibilidade e economia, tornando-as um substituto viável para as avaliações tradicionais em sala de aula, principalmente em situações em que as interações face a face são impossíveis.*

PALAVRAS-CHAVE: *Aprendizagem remota. Métodos de avaliação. COVID 19. Educação on-line.*

RESUMEN: *El propósito del artículo es analizar los métodos de evaluación utilizados por las universidades para evaluar los conocimientos adquiridos por los estudiantes durante el aprendizaje remoto en medio de la pandemia de COVID-19. Los autores han extraído información de artículos e informes científicos para comprender la eficiencia y la eficacia de estos métodos, teniendo en cuenta las restricciones de emergencia vigentes. Se concluye, que ss el aprendizaje a distancia continúa ganando popularidad, las universidades deben reconocer la importancia de mantener la integridad académica. Las evaluaciones en línea ofrecen varios beneficios, incluida una mayor flexibilidad, accesibilidad y rentabilidad, lo que las convierte en un sustituto viable de las evaluaciones tradicionales en el aula, particularmente en situaciones en las que las interacciones cara a cara son imposibles.*

PALABRAS CLAVE: *Aprendizaje remoto. Métodos de evaluación. COVID-19. Educación en línea.*

Introduction

The COVID-19 pandemic prompted an unprecedented shift in the global education landscape, forcing universities to adopt remote learning practices to maintain educational continuity (PIVNEVA *et al.,* 2022). Consequently, assessment methods also had to adapt to ensure accurate measurement of students' learning outcomes. As the experience of use has shown, the forms and methods of control currently being used are imperfect both from a formal and substantive point of view. In this regard, the problem of developing and implementing effective methods of knowledge control within the framework of distance learning is particularly relevant (SHAUSHENOVA *et al.,* 2022).

Any educational system, including distance learning, is characterized by certain components of the educational process. In general, they can be represented as follows:

1. Selection and systematization of the body of knowledge transmitted to students.
2. Arrangement of knowledge in accordance with formalized curricula.
3. Provision of knowledge to students.
4. Processing and perception of knowledge by students.
5. Practical application by students of the received theoretical knowledge.
6. Evaluation of students' knowledge by the teacher.

Gerasimenko and Zenina (2021) concluded, in their study, that the first five stages are the most developed, while the problems of effective and adequate knowledge assessment within the framework of distance learning are not sufficiently developed.

One of the main reasons for this is that distance education does not imply direct live contact between the teacher and the student (BEZBORODOVA *et al.,* 2021). The student must master most of the educational material on their own, which increases the risk of poor-quality education. The problem of user identification is also important; the teacher cannot always be sure who completed the task or control, or whether assistance from outside was used (SETKO; MEDVEDEVA, 2020).

The urgently introduced mode of distance education during the period of restrictions caused by COVID-19, on the one hand, made it possible to put into practice various types of control that ensure the monitoring of individual achievements of students in distance learning (VINICHENKO *et al.,* 2022). On the other hand, the experience of various studies confirmed

that the organization of control in the distance learning system is one of the most difficult methodological problems (PLOTNIKOV, 2022).

Despite the challenges involved in testing knowledge in the context of distance learning, universities must continue to develop effective and fair methods of evaluation. This will help ensure that students receive a high-quality education and that their knowledge is accurately assessed, regardless of the mode of delivery.

That is why, the purpose of this study is to examine the strategies implemented by universities for evaluating the knowledge acquired by students during the period of emergency restrictions.

Methods

Authors have conducted a comprehensive literature search using databases like PubMed, Scopus, and Google Scholar. The search was limited to articles published between 2020 and 2022, and authors focused on empirical studies, scientific articles, and reports that provided insights into assessment methods for remote learning.

The search focused on articles that discussed the methods used by universities to assess the knowledge gained by students during the period of emergency restrictions. The search strategy included a combination of keywords such as "assessment methods", "distance learning", "remote learning", "online assessment", "project-based assessment" and "adaptive assessment".

The authors synthesized the findings from the selected studies to provide insights into the advantages and disadvantages of different assessment methods in remote learning. They also highlighted the challenges and limitations of assessment in remote learning, such as academic integrity concerns and the difficulty of identifying individual student contributions in group projects.

Results

Many universities adopted online assessments, which included multiple-choice questions (MCQs), short-answer questions, essays, and problem-solving tasks (KOTLYAROVA *et al.,* 2023). Research suggests that well-designed online assessments can effectively measure students' learning outcomes (GLADILINA *et al.,* 2022a).

In Russia, two main approaches are used to assess students' knowledge when developing online assessments based on tests: criteria-oriented and normative-oriented. In the criteria-based approach, the level of student achievement is checked against the requirements of the educational standard. With the normative-oriented approach, the level of educational achievement for the entire population of students is evaluated with respect to the norm of the educational standard (SHELEKHOVA *et al.,* 2023). Combining these two approaches expands the possibilities of test item developers. Online testing is quite effective when conducting tests, organizing students' independent work, and when conducting colloquia and tests, and it can act as an addition to a traditional interview. However, concerns about academic integrity and potential cheating have been raised (AVDEEVA *et al.,* 2022).

As the results of the study showed, the most commonly used tools for conducting online tests were remote sessions of teachers with students via Zoom and conducting tests in Moodle (BORODINA *et al.,* 2022). On the Zoom platform, oral testing is carried out in the following way:

1) the teacher and students connect to the resource;

2) the teacher records the accounts of students who have connected to listen to the lecture;

3) after the lecture, the teacher conducts a practical lesson, asks questions, and notes students who have shown activity in preparing answers.

The implementation of this approach is simple: the teacher records the presence or absence of the student, as well as the presence or absence of their answers. At the same time, the disadvantage of this approach is also obvious: in fact, the teacher does not know whether the student has received the necessary knowledge, as well as how deep and high-quality this knowledge is. Thus, formal evaluation comes to the fore, which does not always reflect the true state of affairs. Therefore, for example, during the final testing, students had to complete a written task and explain the answer in video broadcast mode with the display of the desktop.

During the pandemic, the Learning Management System (LMS) Moodle gained great popularity. The authors summarized the main advantages and disadvantages that were noted by researchers in their work, as well as teachers talking about their work experience (GLADILINA *et al.,* 2022b).

The following characteristics were attributed to the advantages:

• Accessibility: Moodle enables students to access course materials, activities, and assessments from any location with internet access, making it ideal for distance learning.

• Flexibility: Students can learn at their own pace, review materials, and complete assignments on their own schedules, allowing them to balance their education with other commitments.

• Customizability: Moodle can be easily tailored to the specific needs of a course or institution, with a wide range of plugins and features available to enhance the learning experience.

• Collaboration: Moodle fosters collaboration among students through forums, wikis, and group activities, encouraging communication and teamwork.

• Cost-effective: As an open-source platform, Moodle is free to use, which can reduce costs for both institutions and students.

• Scalability: Moodle can accommodate a large number of users, making it suitable for universities with high enrollment numbers.

• Assessment and tracking: Moodle offers a variety of assessment tools, such as quizzes and assignments, and tracks students' progress throughout the course.

The most important comments from teachers that authors identified are presented below as the disadvantages and difficulties of using Moodle (SHEVCHUK *et al.,* 2023; PIVNEVA *et al.,* 2023).

• Technical issues: Students may encounter technical difficulties or require technical support when using Moodle, which can hinder their learning experience.

• Limited face-to-face interaction: Moodle's online environment may not provide the same level of social interaction and engagement as traditional classroom settings.

• Learning curve: Moodle has numerous features and options, which may overwhelm some students and require a period of adjustment.

• Internet dependence: Moodle relies on stable internet connectivity, which can be a barrier for students in areas with limited or unreliable access.

• Self-motivation required: Students need to be disciplined and self-motivated to succeed in a distance learning environment, as they must manage their own schedules and learning processes.

• Quality of content: The effectiveness of Moodle for distance learning depends on the quality of course materials, instructor engagement, and institutional support.

• Accessibility for users with disabilities: Although Moodle has made strides in improving accessibility, some features may still be challenging for users with certain disabilities, such as visual or cognitive impairments.

• Open-book Exams: Open-book exams, where students were allowed access to resources during the assessment, emerged as an alternative to traditional closed-book exams (COR *et al.,* 2021). Studies show that open-book exams can promote deeper learning and critical thinking (CORTÁZAR *et al.,* 2021). However, the effectiveness of this approach depends on the quality of the exam questions and students' familiarity with the resources (NG, 2020).

• Project-based Assessments: Some universities opted for project-based assessments, requiring students to develop a product or solution to a real-world problem (GUO *et al.,* 2020). This approach encourages higher-order thinking and collaboration while also serving as an effective evaluation of students' learning outcomes (GOMEZ-DEL RIO, RODRIGUEZ, 2022). Nevertheless, implementing project-based assessments requires considerable resources and planning (ZEN *et al.,* 2022). At the same time, in assessing students' knowledge based on their performance of abstracts, term papers, and project assignments that combine theoretical and practical components, a common issue in Russia is the lack of a guarantee of the authorship of these works.

• Adaptive Assessments: Adaptive assessments, which tailor questions based on students' performance, were also implemented during remote learning (YANG *et al.,* 2022). These assessments have the potential to provide more accurate measurements of students' knowledge and reduce test anxiety. However, their implementation requires sophisticated technology and algorithms, which may not be feasible for all institutions (DELGADO-GÓMEZ *et al.,* 2019).

The COVID-19 pandemic has forced educational institutions worldwide to shift from traditional classroom settings to remote learning. This shift has resulted in the adoption of various online assessment methods, including multiple-choice questions, short-answer questions, essays, and problem-solving tasks. Moreover, the widespread use of online testing tools such as Zoom and Moodle has made it possible for educational institutions to continue their operations and assess students' knowledge remotely. However, concerns have been raised about academic integrity, potential cheating, and the effectiveness of online assessments.

Despite the challenges associated with remote learning, educators worldwide have adapted to the changing landscape and have made efforts to develop effective online assessment

methods. The use of online assessments has several advantages, such as increased flexibility, accessibility, and cost-effectiveness. These advantages have made online assessments a viable alternative to traditional classroom assessments, especially in situations where in-person interactions are not possible.

Discussion

The study revealed that distance learning unexpectedly became a part of our lives with the onset of the Covid-19 pandemic (IVANOV *et al.,* 2022). Various studies indicate that this form of education has its positive aspects, such as reducing the problem of territorial extent and complex mobility of students and enabling them to get education effectively in the best universities of different countries. Many students also appreciated this form of education as it gave them more free time. It is possible that distance learning will become another common form of education alongside full-time and distance learning. In Russia, a form of "blended" education may take root, where practical work, seminars, and laboratory work are held on the territory of the university, and lectures, seminars, and consultations are conducted remotely using web technologies (MEDESHOVA *et al.,* 2022).

During the active restrictions caused by COVID-19, distance learning accelerated the development of technologies for assessing the control of students' knowledge. Many universities around the world have started using special online proctoring systems to ensure that students do not violate exam rules. The system performs student identification and automatically detects any prohibited activities before and during the exam. Surveillance is usually conducted from three sources: audio, video stream, and desktop screen recording. When a student attempts to open another tab in the browser (except for the exam window) or peep/hear hints, the system automatically flags the violation and sends the information to the examiner. As a rule, the progress of proctoring is always monitored by a proctor - a specially trained employee who checks whether the system has made any mistake. Sometimes all violations are monitored by the program (ARTAMONOVA *et al.,* 2022). The choice of didactic and methodological concept, implemented using the selected set of teaching aids, is the decisive factor in the preparation and implementation of distance learning.

To achieve an effective knowledge control assessment system, it is essential to have a qualified teacher who competently, creatively, and effectively uses electronic means and forms of education (HALEEM *et al.,* 2022). Throughout the period of student learning, elements of

Online Assessments, Open-book Exams, Project-based Assessments, and Adaptive Assessments will increase objectivity when assessing knowledge control. Universities need to create conditions and technical capabilities for the implementation of the teacher in the educational environment. Another important aspect of testing knowledge in universities is the need to ensure that assessments align with learning objectives. Universities may need to review and revise their assessment strategies on a regular basis based on feedback from students and faculty.

Conclusion

The authors concluded that it is important to provide technical support and training to both teachers and students to ensure a seamless transition to remote learning. Technical difficulties and internet dependence can be significant barriers to effective distance learning. Universities must also prioritize the quality of course materials, instructor engagement, and institutional support to maximize the benefits of remote learning.

As remote learning continues to gain popularity, universities must recognize the importance of maintaining academic integrity and preventing cheating in assessments. The use of online proctoring systems can ensure that students abide by exam rules, but universities must also address the root causes of cheating, such as academic pressure and lack of engagement.

Overall, the COVID-19 pandemic has necessitated a rapid adaptation of assessment methods for remote learning. While online assessments, open-book exams, project-based assessments, and adaptive assessments have shown promise. The implementation of these methods by universities must consider their unique contexts and available resources. Further research is needed to develop more effective and equitable assessment approaches in remote learning settings.

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