Assessing the Effectiveness of Online Assessment Tools and Techniques

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ABSTRACT

The rapid integration of technology into education has transformed traditional assessment methods, leading to the adoption of online assessment tools and techniques. This study explores the effectiveness of these tools in evaluating students' knowledge and skills in higher education. It examines the benefits, such as instant feedback and the potential for varied assessment types, as well as challenges like issues of validity and potential for cheating. The research analyzes various types of online assessments, including multiple-choice questions, short answer questions, and essay questions, and offers insights into best practices for their design and implementation. The findings contribute to the ongoing discourse on the alignment of assessment practices with technological advancements, aiming to enhance the fairness, validity, and reliability of online assessments.
Keywords: Online Assessment, Educational Technology, Student Evaluation, Multiple-Choice Questions (MCQs).

INTRODUCTION

A shift towards greater use of computers and the Internet has dramatically influenced the way educators teach and students learn. Assessment is one of the functions that is directly linked with student learning. Online assessment is a new technique used in education to assess students' knowledge and skills using the Internet and the Web. Benefits can be gained through broadening the use of online assessment technology. Quick feedback can be provided to students taking an assessment. Utilizing the latest technology in assessment has the potential to generate new types of assessment items. In addition, the design of online assessments may be tailored more closely with the way students analyze and communicate information. On the other hand, the online setting presents questions regarding validity. In particular, students may use extensive means to receiving help with an online assessment that would not occur on a traditional paper and pencil one. New forms of cheating may arise that were not present before and can be difficult to detect. Consequently, there is a need to investigate, both in practice and in research, whether the recent development in assessment technology is exploited to the fullest, or if the current gap between education and technology is reflected in a similar manner in assessment [1]. Every assessment addresses one or more measurement objectives. In the more traditional setting of assessment, an assessment is administered, scored, and interpreted using the same standard conditions for all students. Although this restricts the context in which the students' performance is evaluated and interpreted, it does create the impression of comparability. As assessments are increasingly used for high-stakes decisions, there is a greater need for assessments to be valid and fair to all students [2].

THEORETICAL FRAMEWORK

Assessment is an essential component of teaching and learning that informs decision-making and is closely related to course design, objectives, and delivery. In simple terms, assessment consists of two elements: "the act of measuring and then the level or amount of what is evaluated". Morgan and O'Reilly (2006) further state that assessment has three principles and ten functions. According to the conditions where it takes place, assessment can be classified into formal or informal, observable or nonobservable, teacher-assessed or peer-assessed, needs-based or standardized, and so on. In higher educational

institutions, assessments can also be divided into summative assessment (which takes place at the end of a course) and formative assessment (which takes place prior to and during a course) [3].

With the growing use of the internet in education, there is strong interest in using it to conduct assessment activities. It is believed that technology can be used to enhance student learning and teaching effectiveness. However, research on the effectiveness of online assessment remains limited. Taking this gap into consideration, a study was conducted to examine the effectiveness of online assessment tools and techniques from both educators' and students' perspectives. Modern assessment techniques that are adaptable to the online learning environment are also proposed in this study [4]. The Introduction presents the background to the problem that needs to be addressed, specifically the effectiveness of online tools and techniques on assessment. Providing adequate context for understanding the problem and the research question, the Objectives state the main goals of the study. Theoretical Framework presents the theoretical underpinnings that are relevant to online assessment effectiveness. Conducting the study, Methodology describes the research method adopted, including the sampling technique, statistical analysis, and data collection instruments. Findings and Discussion presents the findings, implications, and recommendations based on the analysis of the collected data. Finally, the Conclusion summarizes the results and significance of the study [5].

PRINCIPLES OF ASSESSMENT

Assessment can be defined as all the processes that are used to evaluate students' performance. The results of assessment serve as a basis for decision-making intended to advance students' academic progress. Based on sentential logic, assessment should be considered as the input of decision-making and have a strong influence on the quality of the decisions taken. Good quality consistency assessment or assessment that is in accordance with the principles of assessment can be expected to have a significant positive effect on the progress of student academic learning. On the contrary, poor quality assessment may lead to harmful effects, which, to some extent, may mislead decision-making. There are several principles of assessment that can be used as a reference for the development of quality assessments. There is still no such common standard governing the process of developing assessment, which can guarantee that the assessment developed will always be consistent with the principles of good assessment. The renewal, particularly concerning information and communication technology, has allowed for the emergence of assessment media with better quality. A number of tools and techniques have been widely discussed, facilitating the implementation of quality assessment such as to help novice authors develop their capability in writing assessment text. Given the challenges above, there is an emerging necessity that assessment tools and techniques are designed to adhere to the principles of quality assessments applicable to both paper-based and online assessments [6].

ADVANTAGES AND CHALLENGES OF ONLINE ASSESSMENT

As with any educational innovations or initiatives, advantages as well as challenges associated with the use of online tools and technologies for assessment should be considered. Several affordances of such tools and techniques frequently cited in the literature include: greater opportunities to answer open-ended questions instead of selecting multiple-choice responses; instant feedback or performance scores to students; institution of instructional methods that help students work through the assessment tasks by allowing access to learning resources such as podcasts and streaming videos; the facilitation of a wide range of assessment methods, which are more authentic, valid and reliable; the reduction of an instructor's workload on traditionally time-consuming assessment methods such as code assessment and problem formulation; the enablement of more effective plagiarism detection and prevention measures; the promotion of regular and frequent assessment which supports formative feedback and has a positive impact on self-regulated learning practices; and easier and more efficient student monitoring [7]. However, the use of computer-based tools and assessment poses some challenges. Concerns relate to alignment with intended learning outcomes or academic standards; the potential for increased administrative workload and subsequent decrease in quality of feedback; an emphasis on learning styles which are not the most effective and do not develop the skills which are not required for subject areas; the promotion of superficial learning or test preparation at the expense of deeper learning; and the potential to unfairly advantage some students, particularly those with limited or no access to computer or internet resources at home. This study also led to the identification of the specific issues relating to using computer-based tools for assessment that may influence the effectiveness of their use [8].

TYPES OF ONLINE ASSESSMENT TOOLS

The five most prevalent types of tools and techniques utilized to assess online student learners in the majority of colleges and universities were examined. The intent was to gain insight into the widely utilized online assessment tools and thereby assess the effectiveness of online assessment tools and

techniques. The five most common types of tools and techniques used to assess student learners in online courses were multiple choice questions, short answer questions, essay questions, discussion questions, and group projects. The rationale for utilizing these tools and techniques in the overall assessment of online student learners was discussed. In addition to the discussion of the above five types of tools and techniques, the effectiveness of these types of assessment tools was assessed [10]. The focus of most online tests is typically on the use of multiple choice questions (MCQs), true/false questions, matching questions, and predetermined short answer questions. These different types of online tests are appreciated by the widely used learning management systems (LMSs) against which the designers of online tests typically work. Other forms of examination commonly used in course-embedded assessment activities, such as essays and case studies requiring longer argumentative written discourse from students, are more difficult to implement in an efficient manner online. However, the numerous flaws of online tests are well documented, and they are frequently used cautiously or not at all in otherwise predominantly online assessment and teaching situations. An assessment standardization perspective suggests that, on the contrary, online tests could be used with more confidence to assess twenty-first century learning outcomes [11].

MULTIPLE CHOICE QUESTIONS

Multiple choice questions (MCQ) are a group of assessment tools in which students will be presented with a question, statement, or problem along with options. Usually, the students will only have one correct answer from the options given. The other options will work as distracters that can mislead the student in answering. This type of assessment tool will be more currently used because it can assess students' reasoning. The use of MCQ assessment can be an alternative way to assess some aspects of students' works that written test cannot do. MCQs are also well known as an objective type of assessment; this helps the teacher in scoring the assessment. It also prevents the students from dishonesty while doing the assessment [12]. In making a good MCQ, there are several aspects to consider: the stem part, accuracy of item, and writing style. There are some aspects to be considered in the stem part of the MCQ. The stem should be clear; otherwise, the students will misinterpret it. The more familiar the stem is with the material, the easier it will be for the students to answer. The stem should express a single idea that the student must address. MCQ is easier to make than written assessment, but care must be taken in using it. Teachers are encouraged to write questions based on higher-order thinking, but most questions were written to measure lower-order thinking skills. Teachers must ensure that the distracters are plausible which requires an advanced level of understanding. Otherwise, the distracters can be too transparent, and the student will find it easy to eliminate all the wrong answer options [13].

SHORT ANSWER QUESTIONS

Short answer questions are a very versatile assessment type that can be used effectively in a number of learning context. They are questions where students are asked to give a short, primarily text-based answer. Very often only a keyword is going to be expected as a valid answer. The questions can be used for knowledge checks, such as medical terms that need to be provided in a midterm, or which one of the certain number of years is correct in a history context. They can also be used effectively as concept questions focusing on more difficult or commonly misunderstood concepts. This requires students to go beyond rote memorization and stimulate their conceptual thinking. Questions can also be used as pre-tests to uncover students' prior knowledge before entering a more complex area of knowledge. In this case the assessment would happen automatically at the beginning of the learning process. However, to design and implement a great concept-question type question, several factors need to be taken into consideration [14]. The set of questions provided that works well in various settings, such as midterms in a first-level physics course (including Matlab computational task assessment), handling biology-type conceptual questions in community-nominated salon-style discussions, curriculum development to introduce assessment, revamping an introductory business course from previously only number-crunching multiple-choice question assessments to include loosely structured queries as starting-off points for postings in online discussions, and formative testing foreshadowing higher-level mathematics. Moreover, there are many questions concerning discipline-specific and culturally-relative properties of questions type as tools gauging text comprehension. However, to implement such questions successfully it would take more effort and some consideration compared to multi-choice selection questions [15].

ESSAY QUESTIONS

Essay questions can be a relevant online assessment tool for a few reasons. By nature, essay questions require that students respond and apply knowledge using their own words. Later, this is much more difficult to replicate than the transferring of a single sentence of text or the selecting of an answer choice. The pedagogical implications of essay questions by nature do seem to assess higher orders of thinking.

Specifically, the website of the University of California-Santa Barbara provides evidence that the use of essay questions is aligned with the assessment of several of the higher order classifications of objectives on Bloom's taxonomy such as comprehension, application, analysis, synthesis, and evaluation. Factors such as the topic of the question, prompt, audience, writing abilities, and knowledge may impact the ability to respond to essay questions [16]. There are a number of considerations to take into account when using essay questions as online assessment tools. First, essay question prompts should be clear and provide the guidelines and expectations for essays. Second, careful thought should be put into the writing abilities of students. A non-native English speaker may feel a different level of competency in responding to an essay question. Third, it may take more time than anticipated to read a large quantity of essays. Total test time should take that into consideration and the course policies adjusted accordingly. Fourth, students should be encouraged to utilize the writing center for assistance with essay topics. In sum, interpreting and applying the information assessed in essay responses does seem to require deeper learning than the testing of selected response items. However, there are both pros and cons of using essay questions as online assessments for students that need to be taken into consideration [17].

BEST PRACTICES IN ONLINE ASSESSMENT DESIGN

Understanding best practices for assessing online assessments, whether using a selection of multiple-choice tests or a more comprehensive approach using rewritten open-ended questions taking into consideration surrounding context. Understanding best practices when implementing tool or technique will be vital for assessing overall effectiveness. However, best practices are quite broad, and therefore certain aspects will be selected as a focus. These include aspects such as assessment structure, question formulation, and justification for evaluation criteria of question quality and analysis methodology [18]. Assessment structure encapsulates everywhere from the types of assessments to when and what students are able to assess with the internal application of the assessment tool or technique. Understanding how certain options in this domain affect assessment effectiveness will be vital in understanding how the chosen tool or technique fits within the wider scope of an ongoing unit. Question formulation focuses on grading sytem and quality. Understanding the quality of grading systems in online assessments will be vital in understanding the overall continuity of the feedback loop with test takers to maintain the integrity of the assessment process [19].

CASE STUDIES AND EXAMPLES

The University of Tennessee and the University of Wisconsin each purchased and implemented WebCT, an online course management system with assessment capabilities. At both institutions, investigators examined the initial stages of WebCT implementation with respect to the questions, "What online assessment tools and techniques are used to assess student learning?" and "What are the attitudes of the instructor and/or the student regarding these tools and techniques?". During the spring semester of 2001, criminal justice courses at both institutions were analyzed. The assessment tools and techniques used in the WebCT courses were compared to similar courses not using WebCT. Several WebCT assessment capabilities were the focus of the study, including online quizzes, discussion boards, and assignment drop boxes, while writing, field work, and traditional quizzes and exams were the focus of the non-WebCT courses. Instructors from both methodologies were surveyed regarding their attitudes toward the various assessment tools and teacher-to-student and student-to-student interaction [20]. Online assessment tools are a common method of assessing student learning in distance education courses. In traditional education settings, assessment techniques are much easier to administer. A test can be physically proctored to ensure that the person taking the test is the same person who did the course work. In distance education courses, tests cannot usually be proctored in the same manner, and different measures are often needed to assess student learning. showed that although online assessment techniques such as discussion boards, quizzes, and individual writing assignments are widely used in distance education courses, traditional assessment techniques, such as tests and presentations, continue to be used in many online courses [5].

CONCLUSION

Online assessment tools and techniques have revolutionized the educational landscape, offering significant advantages in terms of accessibility, efficiency, and immediacy of feedback. However, their effectiveness is contingent upon careful design and implementation that considers both the benefits and potential drawbacks, such as issues of fairness and validity. While online assessments can foster higher-order thinking and self-regulated learning, challenges like academic dishonesty and inequitable access to technology must be addressed. This study underscores the importance of adhering to best practices in online assessment design to ensure that these tools contribute meaningfully to student learning and

accurately reflect student performance. The continued exploration and refinement of online assessment techniques are crucial as education becomes increasingly digitized.

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