Chapter 95
Cybertesting Behaviors

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ABSTRACT

Online instruction and computerized testing has attracted a great deal of attention as college and universities increasingly move toward this mode of teaching and assessment. Many concerns have been raised regarding how to ensure these methods are valid and appealing to students and their parents. Researchers have addressed various facets of these issues; in particular, a number of studies have been published regarding how online assessment may affect student performance and test anxiety. We review the literature in this area and provide corresponding practical and ethical recommendations.

INTRODUCTION

Increasingly, educators are relying on technology to automate the assessment of student learning. The Internet provides one avenue through which teachers can administer electronic assessments. More generally, electronic assessments refer to self-report measures presented to individuals who complete them in an electronic format, via either a software program installed locally on a computer or through an Internet-enabled device such as a computer, laptop, or mobile device. Primarily, we are concerned with academic assessments rather than psychological tests, opinion polls, surveys, and employment screening measures, which could also fall under the umbrella term of computerized assessments. Thus, online academic assessment refers specifically to administering Internet-based exams that measure student learning.

One of the primary advantages of computer-based instruction over other traditional forms of assessment is the immediacy of feedback (Mason & Bruning, 2001). Although the effects of immediate feedback on learning are not overwhelmingly positive (for review see Shute, 2007), a reduction in the latency between instruction, assessment, and feedback may increase learning under certain conditions. Web-based programs are suitable for

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delivering assessments conducted outside of class, but they may not be practical in the classroom unless each student has access to a computer or other internet-capable device. Furthermore, the psychological impact of online tests on students who traditionally have taken paper and pencil exams in the classroom must be considered. Online testing could potentially affect students' performance and other test-taking behaviors such as coping strategies and manifestations of test anxiety. Indeed, the focus of this chapter is primarily on the effects of computerized and online testing on students' performance and test anxiety. Finally, in addition to the practical considerations of online testing, the use of the Internet to give academic tests raises unique ethical and privacy concerns.

OVERVIEW

Historically, providing individualized instruction or feedback to students has been appealing to educators, but the first successful attempt at mechanizing assessment of student learning occurred in the early 1920's. Educator Sidney Pressey constructed a machine that allowed students to take multiple-choice tests by selecting a button that corresponded to their answer. The machine would indicate if the student's answer was correct, thus providing immediate feedback (Pressey, 1926). The machine could also force the student to get the correct answer before moving on to the next question. Pressey hoped that the automatization of the clerical duties of teachers "...would leave the teacher more free for her most important work, for developing in her pupils fine enthusiasms, clear thinking and high ideals" (Pressey, 1926, p. 376). Psychologist B. F. Skinner later expanded on this idea of a "teaching machine" that would not only provide immediate feedback to students on their performance, but could be used for self-paced instruction (Skinner, 1958).

As technology progressed, it continued to be adapted to meet educational goals. With the birth of the microcomputer, computerized assessment emerged as an efficient alternative to traditional paper and pencil tests (or even the "teaching machines" of the past). Initially, students could only take these tests on a computer that had the testing software installed, usually in a school computer lab. With the decrease in cost and increase in portability of personal computers, learning programs could be used in other environments, including one's own home. However, it was not until the 1990's when the Internet arrived that students could take assessments virtually anytime and anywhere.

Naturally, once the Internet became widely available, educators adopted it as a tool to deliver assessments of student learning. Indeed, by 1999, a RAND report (Kelin & Hamilton, 1999) suggested that K-12 schools adopt wide-scale use of web-based standardized tests that deliver questions to students based on how well they did on the previous question. If a student responded correctly to a test question, a computer algorithm would select a more challenging subsequent question. In contrast, making an error would result in the presentation of an easier question. Another variation of this so-called Computerized Adaptive Testing (CAT) is Self-Adaptive Testing (SAT), in which the examinee (instead of the computer) chooses the difficulty of the subsequent question, giving the student greater control in the testing situation (Rocklin & O'Donnell, 1995). Thus, CAT and SAT tests are adapted to the ability of the student, which is in contrast to linear computerized tests, where the test items and order are the same for each student (McFadden, Marsh, & Price, 2002). The authors of the RAND report argued that CAT benefits include more rapid placement of students (relative to others) using fewer test items, individualized test items can be adapted to the level of the student, results are immediate, and repeated testing can be used to monitor growth. Now, nearly a decade later, CAT tests