Chapter 3.6
Improving Employee Selection with Online Testing

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INTRODUCTION

Advances in technology now enable employers to utilize computers to administer online employee selection tests, which result in lower costs, increased efficiency, and fewer transcription errors (Richman, Kiesler, Weisband, & Drasgow, 1999; Tippins et al., 2006). Additionally, online employment testing software can effectively and efficiently assist in identifying individuals best suited to an occupation, reducing poor person-job fit, lowering turnover rates, decreasing training costs, and minimizing errors in hiring (Bingham, Ilg, & Davidson, 2002; Mooney, 2002). This article addresses issues related to online employment testing software including types of tests available, validity and reliability, proctoring, and social desirability. Additional terms are defined and implications and future directions for research are discussed.

BACKGROUND

For decades, the similarities and differences between written tests and computer-based tests have been assessed (Epstein & Klinkenberg, 2001). Early research investigated how a computer-based medical records keeping and interview system impacted patients (Slack & Van Cura, 1968; Slack, Hicks, Reed, & Van Cura, 1966). Additionally, research in this era investigated the use of computers as data gathering instruments (Evans & Miller, 1969; Vinsonhaler, Molineaux, & Rodgers, 1968). However, it is not until the 1990s that we see a research trend that begins to examine the equivalence of computer-based tests vs. conventional tests in an organizational setting (Donovan, Drasgow, & Probst, 2000; McHenry & Schmitt, 1994).

As technology has evolved, tests previously administered in a paper-and-pencil format have been changed to online versions. These tests include

clinical measurements, personality tests, attitude scales, cognitive ability tests and training inventories (Mead & Drasgow, 1993). Further examples of computer-administered assessments include medical admissions data, psychiatric evaluation exams, and consumer preference evaluations (Kiesler, Walsh, & Sproull, 1992; Richman et al., 1999; Synodinos & Brennan, 1988; Synodinos, Papacostas, & Okimoto, 1994).

The most simple and widely used type of computer-based test is computer assisted testing (CAT). These tests display a question on a computer screen and the respondent enters their response (Epstein & Klinkenberg, 2001). Computer assisted tests enable the online format of a test to very closely resemble the paper-and-pencil version and make the testing situation as similar as possible to a written one (Rozensky, Honor, Rasinski, Tovian, & Herz, 1986).

Another type of CAT program uses computer adaptive testing. Adaptive testing settings are different from assisted ones in that adaptive tests allow the computer to "go beyond a simple page turning function" (Epstein & Klinkenberg, 2001, p. 298). Adaptive tests allow a computer to receive a response, score it, and then choose the next appropriate question, either easier or harder based on a respondent's answer (Green, Bock, Humphreys, Linn, & Reckase, 1984). In adaptive tests, which Epstein & Klinkenberg (2001) assert are similar to most non-computerized intelligence tests, there are multiple types that can "individualize" the testing experience and narrow the number of questions needed to assess the underlying trait (Burke, 1993; Weiss, 1985).

There are multiple options when using adaptive formats. A "two-stage" adaptive test is one in which a participant is given an initial pre-test called a routing exam. Based on his or her score on the routing exam, a test is then administered, which corresponds to their knowledge of the content (Epstein & Klinkenberg, 2001, p. 298). Other tests similar to the "two-stage" include the "pyramidal," "flexilevel," "stradaptive," and

"countdown" approaches (for reviews see Butcher, Keller, & Bacon, 1985; Epstein & Klinkenberg 2001; Weiss, 1985). More recent advances include test types called generating examples (GE) and are found described in reviews by Bennett (1999), Bennett et al., (1999) and Bennett, Steffen, Singley, Morley, and Jacquemin (1997).

Potential administrators of online tests must consider two main factors. First, the content area of the test must be identified. Whether it is desirable to test hard skills (e.g., proficiency in software or programming) and/or basic knowledge (e.g., ability to solve problems, communication skills) is the key consideration (Mooney, 2002). Second, online test administrators must consider who will compose the test. Many testing service companies will offer "authoring software" that enables users to compose their own questions as an alternative to the standard "menu" of tests available for various job classifications (Mooney, 2002). The authorship issue brings up questions of reliability and validity. This is especially true considering that the "in-house" development of tests may be the lower cost, but less reliable and valid option (Mooney, 2002). Companies often charge more per test administration for tests directly off the "menu" vs. charging a fee for test development but lowering the per test charge if it is modified by the end user (Mooney, 2002). It is important to note that most authoring software only allows for the creation of yes/no and true/false questions (Mooney, 2002). Additional considerations for potential administrators of online tests include the creation of user id's, whether to use a timed test, whether respondents are proctored, whether respondents can backtrack to previous responses, and how to notify participants of results.

THE ACADEMIC AND FINANCIAL BOTTOM LINE

The bottom line is that, in most cases, online employment testing saves companies money and

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