



Chapter XV

From Paper and Pencil to Computerized: A Dental Board's Perspective

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Abstract

Computerized testing offers many advantages over paper and pencil exams. Advantages can include increased security, greater availability of the exam, rapid scoring, and reduced administrative costs. Possible disadvantages can include the need for computer hardware and software, computer glitches, and computer anxiety. This chapter discusses the advantages and disadvantages of computerized testing followed by a description of the experience of a state-based dental board as they transitioned from a paper and pencil exam to a computerized exam.

Introduction

In a relatively short time, computers have gone from huge behemoths accessible only to obscure scientists to small machines in homes throughout the world. Many household tasks previously done manually are now being completed by computers. As access to computers has increased, software applications have multiplied. The testing

world has also experienced major changes driven by the prevalence of computers in society. Because of the benefits offered by computers, many exams are being converted from their original paper and pencil format to a computerized format or being developed and delivered completely via the computer. Prior to converting a paper and pencil-based program into a computer-based program, test sponsors should consider the advantages and disadvantages. If the decision to computerize the exam is made, the transition from old to new delivery modes should be planned carefully. This chapter seeks to briefly review historical advantages and disadvantages of computer-based testing, discuss current advantages, and then offer a case study.

Early studies of computerized testing mention as potential drawbacks the lack of available computer hardware and frequent hardware and software glitches. In their article titled "Testing by Computer: Findings in Six Years of Use, 1982-1988," Bugbee and Bernt (1990) state that "computer equipment and performance is perhaps the greatest potential problem in this type of testing" ("Negative features" section, ¶5). Although access to computers and hardware and software glitches are still problematic, computers are now common fixtures in school labs, businesses, and homes. Early DOS-based programs have been replaced with programs developed on more stable operating systems, reducing the software challenges faced earlier.

In addition to the physical problems, much early research was done comparing candidate scores from exams delivered via paper and pencil and computerized versions. Results from these studies were mixed; several studies found no difference in exam modes, while others found relatively large differences (Bugbee, 1996). A likely addition to early findings of differences between modes was the concept of computer anxiety. As computers have been assimilated and normalized in our environment, the concept of computer anxiety has become less worrisome. As stated by Bugbee (1996), "It is not unreasonable to expect that although test anxiety will never disappear, computer test anxiety could become extinct in the near future with increased computer knowledge and comfort" ("Discussion" section, ¶6). In addition to being challenged by computer anxiety, test-takers may perform differently due to the limitations of the mode of presentation. For example, lengthy passages may require a page break in a paper and pencil exam but employ a scroll bar when computerized. Both of these artifacts may affect item performance (Pommerich & Burden, 2000). Clearly, when considering conversion from paper and pencil to computerized examinations, administrators must consider the level of comfort with computers and appropriateness of the items to computerized environments. As computers have become more accepted and common in our environments, many of these concerns have diminished. For the older generation, reading long passages requiring the use of a scroll bar may still be uncomfortable, but for the younger generation, such a reading environment may be more common than turning pages.

One finding that has remained constant through the research is the preference that candidates have for computerized exams (Glasnapp, Poggio, Yang, & Poggio, 2004). Even candidates taking early forms of computerized tests reported a preference for the computerized versions due to their rapid scoring and flexible scheduling (Bugbee & Bernt, 1990). Currently, computerized testing offers many advantages over paper and pencil delivery. A brief listing and explanation of some of these advantages includes the following.

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