

Chapter One

OVERVIEW OF TECHNOLOGY- ENHANCED ASSESSMENTS

Nancy T. Tippins

The availability of affordable, easy-to-use technology-based tools and their interconnectivity via the Internet have hastened the spread of technology into virtually all aspects of our lives. The Internet provides quick access to huge amounts of information and facilitates all kinds of relationships among all kinds of people. In the last fifty years, technology has changed how we do our work, how we spend our leisure time, and how we interact with others. The next fifty years promises more of the same.

Technology has permeated work in the 21st century, and the field of talent assessment is no exception. Technology has influenced what kinds of assessment tools are used as well as how they are developed and administered, enhancing some traditional practices and fundamentally changing others. For example, a multiple-choice test may now be administered via a computer that displays items, scores responses, and stores test results. Alternatively, realistic work samples administered via a computer that might have been too labor intensive or too inconsistent in the past can replace a more abstract form of standardized testing. Unproctored prescreens administered via the telephone or a computer narrow

the applicant pool to a more manageable size. In the development phase of a test, large numbers of items are developed and their item parameters are defined so that many equivalent forms can be constructed automatically for computer adaptive testing.

The objective of this volume is to enable practitioners to make better decisions about using technology-enhanced assessments in the workplace that are based on current scientific knowledge and best professional practices. This volume explores the methodological underpinnings of technology-enhanced assessment as well as the measurement concerns its use raises, and then provides examples of how technology has been employed in assessment procedures in real-world applications. The purpose of this first chapter is to set the stage by defining the scope of what will be covered in the volume and then providing a brief discussion of the opportunities and the challenges the use of technology-enhanced assessments presents. Brief sections on the future of technology-enhanced assessment are presented before the chapter concludes with an overview of the entire volume.

What Is Technology-Enhanced Assessment?

In this book, we refer to technology-enhanced assessment as the use of any form of technology in any aspect of testing or assessment. Technology-enhanced assessments can include various technologies used for presenting or scoring items or other assessment materials. For example, computers, personal digital assistants (PDAs), telephones, interactive voice response (IVR) equipment, or video-teleconferencing equipment may be used to present testing materials. Perhaps most simplistically, a computer serves as a page turner that presents items and response alternatives on a screen and collects responses, or an IVR presents items orally and records responses. At the other extreme, complex in-baskets that involve emails, voice messages, memos, telephone calls, and appointments simulate actual work and require test-takers to behave as they would in a realistic setting.

The range of testing formats used when technology is introduced is broad. High-volume testing programs, particularly those focused on screening candidates, continue to use multiple-choice

formats administered on computers and IVRs. Yet, other item formats are increasingly used in conjunction with technological tools. Structured interviews have been adapted for delivery over computers. The work samples and simulations that are components of assessment centers or sophisticated selection batteries are often delivered via computer and responses to them are captured electronically via a computer or video or audio recording equipment. Some assessments make use of video teleconferencing equipment that enables assessment center participants and assessors to work from different locations.

Computers can be programmed to deliver fixed forms of a test or determine which items or tests to present depending on answers to questions on an application blank (for example, For which jobs are you applying?) when the assessment system is integrated with an applicant tracking system (ATS), or on responses to previous items as in computer adaptive testing. Similarly, sophisticated, electronic test data bases can automatically determine who is eligible to test and when they are eligible.

Computers are often used to score test items by determining which responses are correct and incorrect as well as aggregating responses to items into test scores and test scores into battery scores, sometimes based on complex algorithms. Traditionally, computers have simply been used to execute programs that specified exactly what was right and what was wrong. Increasingly, computers can take into account patterns of responses to items in more complex scoring procedures. An emerging technology that is beginning to be used more often involves data mining techniques that evaluate complex written responses. Although many constructed responses must still be evaluated by human evaluators, video technology that records the responses allows checks of the scoring process that increase accuracy.

Similarly, computers can be used to store responses as simple as the number or letter of a response alternative or as complex as the summaries and spreadsheets associated with a business case or a videotape of an interactive role play simulation or the written responses to a structured interview that has been presented online. Typically, responses to test items that are presented electronically are also stored electronically. Even when tests are not delivered via a computer, test results may be

entered into an electronic database. Increasingly, technology is used to distribute test responses and test scores. For example, work sample products are distributed to assessors electronically; test qualification status is sent to hiring managers; or test feedback is sent to candidates. Because of security concerns, many test users avoid distributing confidential information such as test results via email; instead, these are stored in “eRooms” where authorized users may access confidential data.

What Are the Advantages and Disadvantages of Technology-Enhanced Assessments?

As technology has become increasingly easy to use, affordable, and widely available, industrial and organizational psychologists have learned that there are many factors to be considered when making decisions about how to use technology in assessment and that few factors can be considered solely an advantage or a distinct disadvantage. Instead, the thoughtful industrial and organizational psychologist must consider the entire set of benefits and liabilities of a specific technology-based approach in his or her specific situation and compare them to the pros and cons associated with each of the alternatives. The next section highlights the most important factors.

Cost

An overall assessment of cost is particularly difficult to obtain because there are typically many sources of costs in a technology-enhanced assessment program. For example, there is the cost of administration, and there is the cost of developing items. Moreover, there are tradeoffs between costs and the anticipated benefits. For example, an organization may spend the money to develop a computerized work sample not because it is cheaper but because the realistic assessment results in a better estimate of an individual's skills, attracts better-qualified candidates, or provides a realistic job preview. Another organization may computerize its executive assessment process in order to standardize the process globally, even in locations where face-to-face assessment is practical.

In many respects, the use of technology has lowered the cost of assessments. As technology has replaced live administrators, proctors, scorers, and data-entry personnel, labor costs have undoubtedly decreased dramatically. Even when an organization considers the cost of outsourced test administration services, the costs are typically reduced whenever personnel have been replaced by computers.

When computer-administered tests began to be used in private industry for large scale selection programs, many industrial and organizational psychologists were concerned about the high cost of equipment. However, two important things have happened since that time to alleviate that concern. First, the cost of equipment has dropped substantially. At this point in time, it is reasonable to assume that most equipment costs are more than compensated for by reductions in labor costs. Second, many testing programs have shifted the obligation to provide equipment from the employer to the candidate through unproctored testing programs.

The equipment on which a test or assessment is administered is only one type of equipment usually required. Large scale testing programs often require servers that contain the administration programs and executable modules to be downloaded to the user's computer as well as data bases to store results, including data at the item, test, and battery levels. Increasingly, demands for reliable accessibility require redundant servers, and security concerns necessitate highly technical barriers to these servers. Some users of assessments that transmit real-time video may find that the bandwidth required is not available in some countries at any price.

At the same time that costs of labor associated with administration and scoring and equipment have diminished, other sources of costs may have increased or new sources of costs may have been introduced. For example, the number of items that are required for computerized tests often increases substantially because of security concerns, particularly when unproctored Internet testing (UIT) is used. Thus, more labor is required to develop and maintain a larger pool of items. Similarly, test administration procedures involving computer adaptive testing were not feasible in most situations without a computer; yet, the programs for such administration have to be

written and maintained. Similarly, complex work simulations like in-baskets may require substantial programming expense.

In addition to requiring large number of items with accurately defined item parameters, UIT used for selection purposes can introduce other costs. For example, companies that use verification should account for the costs of the UIT plus those associated with later verification testing. Moreover, the employer must also consider what effect UIT has on its applicant pool and determine if the UIT has an effect that has implications for costs such as broadening the applicant pool or reducing the number of qualified people who remain in the recruitment and selection process or who are likely to accept a job offer. A technology-enhanced testing program that is off-putting to qualified candidates may reduce testing costs while increasing recruiting costs.

Whether the reductions in costs exceed the increases in costs is obviously dependent upon many factors including the choice of instruments, the organization, its staffing context, the resources available, and the expectations of its applicant pool. Direct comparisons of total costs for various approaches are difficult if not impossible to make. Each assessment user is advised to carefully consider all the sources of expense as well as the tradeoffs among various elements of the staffing process, and plan accordingly.

Effect on the Quality and Quantity of Candidate Pool

A critical concern for organizations that use any sort of assessment for selection purposes is the impact on the quality and quantity of the candidate pool. Many assessment programs that have incorporated technology into their delivery are still administered in controlled settings with proctors. In theory at least, these technology-enhanced assessments should have no effect on the size of the candidate pool when compared to a proctored paper-and-pencil version of the same test. However, apple-to-apple comparisons are often not made. When apples are compared to oranges, some might argue that a realistic, technology-enabled assessment program used for selection may be more engaging and may help keep some candidates in the applicant pool longer than a less realistic form of evaluation that does not require technology.

Many technology-enhanced assessments are administered in unproctored conditions at times and places of the candidate's convenience; yet, there is little consensus on the effect of this flexibility on applicant behavior during the recruiting, selection, and hiring processes. Many staffing professionals argue that the freedom to take a pre-employment assessment any time or any place greatly expands the number of people who actually take the test. The lack of constraints on the actual testing event may also improve the quality of applicants because the employed are able to look for other employment without taking time off from their current jobs. There are contrasting arguments, however, that suggest the number and quality of applicants may be limited when UIT is used and the applicant must supply the equipment necessary to take the test. If a digital divide exists, UIT may have no effect on applicants from higher socio-economic status brackets but severely limit representation from lower brackets. Based on anecdotal evidence, recruiters often argue that many applicants have a low tolerance for completing lengthy applications and tests on the Internet and only the most desperate candidates will pursue lengthy and rigorous online selection procedures. Others postulate that highly qualified candidates have higher expectations regarding their treatment as applicants and drop out of the recruiting process when the selection procedures do not acknowledge their special qualities. Simultaneously, one could hypothesize that some applicants appreciate the respect for their time and the recognition that some assessments do not need to be administered in a face-to-face setting. Some employers fear the use of UIT will dissuade the honest applicant from pursuing employment because of the company's assumed acceptance of malfeasant behavior. Further, UIT may increase the amount of cheating that occurs on some types of tests and consequently result in a less qualified pool of candidates for the next step in the hiring process.

Perhaps, the most obvious effect of increasing or decreasing the quality or quantity of the applicant pool is on recruiting costs. If UIT increases the number of candidates who apply and remain in the selection process when recruiting costs are held constant, the per hire recruiting expense decreases. A larger proportion of more qualified candidates reduces the number of

people who must be attracted to the hiring process and evaluated. Equally important but sometimes overlooked is the effect of a larger applicant pool on the capabilities of new employees. Many employers want the best of the applicant pool and not merely the acceptable. As the applicant pool increases relative to the need for new employees, an organization may raise its standards and select individuals with higher abilities. The user of a technology-enhanced assessment for selection purposes should anticipate its effect on the quality and quantity of the candidate pool and take into account the implications for recruiting costs and for the capability of the workforce.

Candidate Expectations and Reactions

Closely related to concerns about the number of candidates and their capabilities are issues regarding candidate reactions to technology-enhanced assessments. Generally, organizations want positive candidate reactions because they are typically associated with candidates who stay in the employment process rather than drop out. In addition, many employers want to maintain positive relationships with applicants because they are also customers of the firm's products and services.

It is, of course, impossible to answer the question, "Do technology-enhanced assessments increase positive candidate reactions?" for all situations. The answer depends on what kind of assessment is used and what the candidate's expectations regarding assessment are. Some candidates will expect to see technology embedded in a testing program for some jobs in some types of companies, while others will expect a high-touch evaluation without technological intervention. For example, applicants to a manufacturing technician position in a high-tech firm might expect a highly mechanized selection process, but applicants to executive level positions in a service-oriented business might be disappointed in the selection system unless face-to-face interviews with the firm's management were used.

Different types of test and technologies also generate different reactions. One candidate may find a computer adaptive multiple-choice test somewhat irritating because everyone seems to get different numbers of items on a test. At the same time, this

candidate may enjoy a work sample test that measures arithmetic skills used in a teller job in a realistic setting. Others taking the computer adaptive multiple-choice test may prefer its efficiency to a lengthy test that presents a large number of items that are not particularly challenging. Candidates completing a realistic, technology-enhanced in-basket in the context of a leadership development and selection program may have negative reactions because the technology is different from the tools they use every day (for example, email programs, word processing programs). Other candidates' less than positive reactions to the in-basket may have more to do with the quality of the in-basket items and less to do with the technology.

It merits noting again that a candidate's reaction to the testing situation may affect his or her propensity to remain in the employment process, but once again, contradictory outcomes are possible. Some believe that capable candidates will exit the process because of concerns about an organization that appears to tolerate cheating in unproctored testing environments. At the same time, it is possible that more qualified candidates remain in a selection process when the selection process is efficient or realistic, as is the case with UIT or some work samples, respectively.

In addition to keeping well-qualified candidates in the applicant pool, another concern of many employers is the perceptions candidates have regarding the fairness of the selection system. The realism of the assessment practice often determines the candidate's perceptions of fairness regarding the testing system. The more like the job the assessment is, the less likely candidates are to claim the testing is unfair. Technology can make assessments more job-relevant, particularly when there is a heavy technological component on the job. At the same time, complex test administration systems (for example, computer adaptive testing) that use abstract items may be particularly subject to feelings that the test is not relevant.

Consistency of Administration and Scoring

Standardized testing conditions have been emphasized in industrial and organizational psychology because they increase the reliability of the test score and its validity and support a

common interpretation of the test score. One of the significant advantages of computer-based administration is the consistency of test administration and scoring. The computer does both tasks as programmed, and no test administrator forgets to time the test correctly or uses a key incorrectly or makes an error in scoring. Yet, because technology enables the distribution of assessments and many programs allow test-takers to take the tests and exercises any place and any time, variation in the testing environment is introduced. In contrast to a proctored test environment in which seating, lighting, temperature, etc., are often specified, an unproctored test may be taken under conditions that are rife with distractions and result in the test-taker's performance being less than maximal.

Security of Test Materials

Test development is expensive, and test materials (for example, test items, scoring keys) that have been compromised by UIT may result in test scores that are not interpretable because some people have had assistance that is not available to all candidates taking the test. Thus, employers usually take great care in protecting the materials. Traditional, paper-based testing programs have often emphasized procedures for accounting for testing materials such as serializing tests, accounting for all forms before and after use, storing them in secure areas, etc. Industrial and organizational psychologists who have managed test administration in such programs are all too familiar with security breaches ranging from candidates stealing tests and administrators leaving tests on copy machines to printers losing entire shipments of tests and unknown persons breaking into employment offices.

In many respects, simply placing a test that is proctored on a computer increases test security. With sufficient password protection, unauthorized people have a difficult time getting to the test. In monitored conditions, stealing a computer is more difficult than swiping a piece of paper. Yet, in unproctored conditions, candidates can capture questions from computers as easily as from paper documents by simply writing them down. Although it is difficult to leave a copy of a computer on a photocopier, there are other methods of acquiring test content through electronic

means, particularly if the Internet-based test is unproctored. Ironically, some of these methods of theft may be much more difficult and expensive to detect than a missing serial number.

Administrative Ease and Flexibility

The administrative ease and flexibility of a test program is a prerequisite to speedy and accurate selection decisions, and that administrative ease and flexibility depend on a number of things, including the personnel required to administer the test, the training required of those personnel, the equipment necessary for administration and its mobility, the ability to update the testing materials easily, and the dependability of the testing process.

Most employers pay close attention to the ability of their staffing personnel to administer and score an assessment in an efficient manner. Assessment programs that require large amounts of administrator time (for example, face-to-face assessment centers, structured interviews) usually cost more than those that require less time. Once developed, many computer-based administration programs are simple to use and require little administrator time. Once the administrator initiates the test, the computer often presents the instructions and items, times the test, scores responses, etc. Most computer-based tests can be easily updated by automatic downloads of which a user may not even be aware. The barrier to administrative ease and flexibility, however, is the initial programming that makes some of these functions possible. The costs of developing and maintaining the software that administers tests and upgrades programs is usually not trivial. Although a computer-based test may be easy to administer by personnel with minimal training, not all technology-enhanced assessments are necessarily used without extensive personnel training. For example, a computer-based in-basket may require extensive training for professionals who are already well-schooled in assessment procedures, and any changes to the scoring process may require retraining.

The flexibility of where an assessment is administered is one area in which there is no clear advantage of technology-enhanced assessments. On one hand, UIT facilitates administration virtually anywhere. On the other hand, the requirement for a computer

and an Internet connection may severely limit the places where a test can be administered. For example, job fairs may not be conducive to on-the-spot testing because of Internet connectivity issues. The flexibility of administration location for other forms of technology-enhanced assessments is also mixed. For example, physical ability work sample tests can be very difficult to move around. A pole climbing test can only be conducted where poles are planted. However, a strength test using an electronic load cell may be highly portable in contrast to a series of weights that are consistent with materials lifted on a job. Telephones for IVR prescreens are ubiquitous. Reliable audio and video equipment may be less widely accessible, particularly when used internationally.

Because it may be difficult to get applicants to a testing event, most employers want reliable assessment procedures that are ready to be used. Many perceive the IVR-delivered test to provide maximum flexibility in both when and where the assessment is administered and how available it is. Computer-based tests are also flexible in terms of time and place, and many are consistently accessible by the test-taker. Yet, again, there is no clear advantage of technology-based assessments over more traditional forms. Telephones, computers, and Internet connections have all been known to fail. Although telephone land lines represent one of the most reliable technologies used today, mobile telephones certainly drop calls. Many test delivery programs can function without the Internet connection, which must be re-established for scoring and storage of test scores. In contrast, a paper-and-pencil test is highly dependable; nevertheless, such a test requires qualified personnel to administer it and score it.

Cheating

Almost any mention of UIT, which assumes technology, raises questions about all kinds of cheating. How much cheating takes place? What kinds of cheating occur? Who cheats? What actions can prevent cheating? Etc. Although cheating is a major concern in UIT and the IVR prescreens, it is naïve to believe that cheating does not occur in proctored settings that involve no technology. Cheating can occur (and probably will occur) whether technology or a proctor is involved or not. Although UIT opens the door

to cheating, computerized administration also offers novel means of detection, albeit after the fact.

Some forms of technology-enhanced assessment may actually lessen the amount of cheating that occurs. For example, interactive assessment centers that occur via the Internet and are taped may actually enhance security by ensuring the person taking the assessment is actually the correct individual.

What Does the Future Hold?

A certain amount of hubris is always involved in predicting the future. Nevertheless, it seems safe to proffer the notions that (1) technological changes will continue at a rapid pace and (2) these new technologies will affect talent assessment as well as the workplace in general. If these speculations are true, the time of industrial and organizational psychologists must be spent learning about current technologies, staying abreast of emerging technologies, developing creative applications that use these technologies, and dealing with the problems inherent in them.

In addition to the need to understand technology as it relates to tests and assessments, however, the industrial and organizational psychologist must continue to explore the impact technology has on the evaluation of individuals and the conclusions the organization may draw from test scores. Many questions remain unanswered and, at times, the number of questions appears to be growing faster than the repository of research and answers. Although there are myriad questions that must be addressed for each type of technology-enhanced assessments, they can be grouped into two general categories: (1) effect on candidate behavior and reactions and (2) effect on the organization.

A fundamental question for all technology-enhanced assessments is the effect their use has on the test-taker, particularly those who are taking an assessment for selection purposes. Does the incorporation of technology make an individual more or less likely to apply for a job and take a test? To exhibit some form of malfeasant behavior? To remain in the hiring process? To accept a job that is offered? The answers to such questions are further complicated because the answers are contingent upon other factors, including the type of test, the kind of technology used, the

purpose of the assessment, and individual differences across test-takers. For example, the recent college graduate taking a cognitive ability test in an unproctored setting to obtain a high paying job may feel and act differently than a middle-aged employee completing a biodata form as part of a developmental assessment.

Just as technology-enhanced assessment affects individuals, it also can affect organizations. Organizations need to be able to accurately interpret test scores and draw appropriate inferences. Consequently, the effect of technology on validity and reliability may color how the organization uses the test score as well as the test policies that are set. Most organizations are cost-conscious and will be vitally interested in the costs and benefits of technology directly on testing and indirectly on recruiting. Ultimately, the organization will want to know the level of employee capability technology-enhanced assessment produces. Just as there are numerous factors that must be considered when evaluating effects of technology-enhanced assessments on the individual, there are other factors to be considered when answering organizational questions. What kind of test? What kind of technology? For what purpose is the test used? What kinds of individual differences?

Cheating on UITs has important implications for individual behavior as well as organizational behavior, and for most test users, the topic of cheating is critical. Researchers must continue the research on topics such as when cheating occurs, the extent of cheating, and the impact on validity, and practitioners must advise organizations in their use of tests administered in unproctored conditions, developing the appropriate guidelines and policies for use UITs and interpretation of their scores.

Finally, testing is not without ethical implications and legal consequences, at least in the United States. In the future, researchers and practitioners must provide guidance on the ethical use of technology-enhanced assessments, especially UIT, and maintain their understanding of the legal limits to their use.

Overview of the Chapters

To achieve its goal of aiding industrial and organizational practitioners in making wise decisions based on current science and best practices, the first half of this book contains a set of foundation

chapters that address critical measurement issues that face the practitioner considering a technology-enhanced assessment. The second half provides examples of innovative uses of technology that illustrate how technology has been used in employee selection.

The first section of the book begins with Chapter 2, which provides an overview of measurement issues by John Scott and Alan Mead. The authors emphasize traditional criteria for effective testing and provide a thorough description of the steps that must be undertaken to develop a test that is both reliable and valid. The authors explore the importance of standardization and measurement equivalence and discuss how cheating can affect the psychometric properties of a test.

Aiming to assist the practitioner in successful implementation of technology-enhanced assessments, in Chapter 3 Doug Reynolds introduces a framework for implementation to achieve four outcomes: (1) awareness building, (2) alignment and support, (3) planned flexibility, and (4) sustainability. Doug underlines the importance of understanding the environment and the organizational context as well as the assessment itself.

Winfred Arthur and Ryan Glaze take on one of the most critical issues in many technology-enhanced assessments—cheating on unproctored tests—in Chapter 4. The authors define cheating or malfeasant behaviors in both cognitive and non-cognitive tests. The chapter is organized around five questions: (1) What are cheating and response distortion? (2) What is the extent of cheating and response distortion? (3) How can they be detected and how effective are those methods? (4) What should an organization do with information about cheating or response distortion? (5) How can these behaviors be deterred?

Robert Gibby and Rod McCloy discuss computer-adaptive testing in Chapter 5. After a brief description of CAT and explanations of general principles, they provide an example of an unproctored, cognitive CAT that was developed in Procter & Gamble for employee selection.

In Chapter 6, Talya Bauer, Donald Truxillo, Kyle Mack, and Ana Costa consider the special problems and opportunities associated with candidate reactions that may be raised by technology-enhanced assessments. Using Gilliland's model of applicant reactions, they discuss the effects of technology on test-taker reactions and provide recommendations for practice.

Dave Bartram presents the special international issues that are relevant when technology is used to deploy testing globally in Chapter 7 and emphasizes the international guidelines that shape professional testing practice.

The second set of chapters provides case studies presented by practitioners who have used technology in their assessment programs.

In Chapter 8, Terri McNelly, Brian Ruggeberg, and Carrol Ray Hall describe an executive assessment program at Darden, a large restaurant company. Using a virtual assessment center, this team delivered realistic simulations that were aligned with the organization's competencies, cost-effective, realistic to be used for external selection, internal promotion, and internal development.

In Chapter 9, Adam Malamut, David Van Rooy, and Victoria Davis share their experiences with a web-based screening program, "Hourly eHiring" at Marriott, which has three components: an online applicant tracking system (ATS), web-based assessments, and fully integrated HR systems. Of particular interest here is the web-based assessments for "heart of the house" jobs such as housekeepers, kitchen helpers, and groundskeepers that assess job relevant knowledge, skills, abilities, and other characteristics while keeping literacy requirements to a minimum.

Amy Grubb has described her work with high-fidelity simulations that are used for promotions to mid-level managerial positions in the Federal Bureau of Investigation (FBI) in Chapter 10. In response to a consent decree and the challenges brought about by the events of 9/11, the FBI overhauled its promotion process and designed and implemented a realistic, "day-in-the-life" simulation that is remotely administered. Amy shares the processes she used for development, validation, and implementation.

Sandra Hartog covers technology-based assessment centers and coaching in Chapter 11. In partnership with The Interpublic Group of Companies, Inc., Sandra and her colleagues developed MyLead, an experiential leadership development program for individuals in mid- to senior-level leadership roles located around the world to provide information for a succession management program.

Chapter 12 presents another approach to technology-based assessment centers for bank branch managers created by Rick Hense and Jay Janovics. Their assessment process uses multimedia (video-based) and psychometric (computer adaptive testing) technology to provide realistic assessment exercises in an unproctored setting.

The work of Jeff Cucina, Henry H. Busciglio, Patricia Harris Thomas, Norma Callen, DeLisa D. Walker, and Rebecca J. Goldenberg Schoepfer in the area of video-based tests (VBT) to evaluate applicants for law enforcement officer positions at the U.S. Customs and Border Protection is presented in Chapter 13. The VBT uses video technology to evaluate judgment and interactional skills in a realistic setting. The chapter shares the psychometric properties of the VBT and outlines the development process used.

In Chapter 14, Eugene Burke, John Mahoney-Philips, Wendy Bowler, and Kate Downey share their experiences in two international companies with using UIT for campus recruitment of college hires and customer service employees in call centers.

In Chapter 15, Mike Fetzer and Tracy Kantrowitz provide an example of computer adaptive testing in the public sector, the Human Resources Department of Riverside County, California. These authors provide the organizational context as well as information about the test and its implementation.

The final two chapters present agendas for future research and practice. Mike Zickar and Christopher Lake present a practice agenda in Chapter 16. In this entertaining chapter, Zickar and Lake emphasize ethical, scientific, and practical issues in three examples of technology that may be used for assessment in the future: use of personal information from the Internet (digging for dirt), brain scanning and imaging, and virtual reality. They conclude with advice to the practitioner for staying current with new technologies.

In the concluding chapter, Seymour Adler highlights the unanswered questions the profession still has. Seymour organizes these questions around four categories: The Assessment; The Candidate; The Organization, and Society.

Final Word

We hope this volume will stimulate your thinking about technology-enhanced assessments, guide your practice, and shape your research; however, as a final word of caution, we point out the obvious. Technology changes rapidly, so much of this book will soon be out-of-date. Although the foundational chapters, especially the criteria for good testing, will remain relatively constant, the innovative uses of technology described in the case studies today may be somewhat stale in the future. New questions will undoubtedly emerge and new research will inform our understanding. Consequently, the industrial and organizational psychologists who work in this area must continually update their knowledge and skills.

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