

Technology And Testing Improving Educational And Psychological Measurement The Ncme Applications Of Educational Measurement And Assessment Book Series

Education is the key to America's economic growth and prosperity and to our ability to compete in the global economy. It is the path to higher earning power for Americans and is necessary for our democracy to work. It fosters the cross-border, cross-cultural collaboration required to solve the most challenging problems of our time. The National Education Technology Plan 2010 calls for revolutionary transformation. Specifically, we must embrace innovation and technology which is at the core of virtually every aspect of our daily lives and work. This book explores the National Education Technology Plan which presents a model of learning powered by technology, with goals and recommendations in five essential areas: learning, assessment, teaching, infrastructure and productivity.

Testing in the Professions focuses on current practices in credentialing testing as a guide for practitioners. With a broad focus on the key components, issues, and concerns surrounding the test development and validation process, this book brings together a wide range of research and theory—from design and analysis of tests to security, scoring, and reporting. Written by leading experts in the field of measurement and assessment, each chapter includes authentic examples as to how various practices are implemented or current issues observed in credentialing programs. The volume begins with an exploration of the various types of credentialing programs as well as key differences in the interpretation and evaluation of test scores. The next set of chapters discusses key test development steps, including test design, content development, analysis, and evaluation. The final set of chapters addresses specific topics that span the testing process, including communication with stakeholders, security, program evaluation, and legal principles. As a response to the growing number of professions and professional designations that are tied to testing requirements, Testing in the Professions is a comprehensive source for up-to-date measurement and credentialing practices.

Music Learning Today: Digital Pedagogy for Creating, Performing, and Responding to Music presents an approach to conceptualizing and utilizing technology as a tool for music learning. Designed for use by pre- and in-service music teachers, it provides the essential understandings required to become an adaptive expert with music technology, creating and implementing lessons, units, and curriculum that take advantage of technological affordances to assist students in developing their musicianship. Author William I. Bauer makes connections among music knowledge and skill outcomes, the research on human cognition and music learning, best practices in music pedagogy, and technology. His essential premise is that music educators and students benefit through use of

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technology as a tool to support learning in the three musical processes - creating, performing, and responding to music. The philosophical and theoretical rationales, along with the practical information discussed in the book, are applicable to all experience levels. However, the technological applications described are focused at a beginning to intermediate level, relevant to both pre-service and in-service music educators and their students. This expanded second edition features an all-new student-friendly design and updated discussions of recent technological developments with applications for music teaching and learning. The revamped companion website also offers a new teacher's guide, with sample syllabi and lessons for each chapter.

Assessment innovation tied to technology is greatly needed in a wide variety of assessment applications. This book adopts an interdisciplinary perspective to learn from advances in developing technology enhanced innovative assessments from multiple fields. The book chapters address the development of virtual assessments including game-based assessment, simulation-based assessment, and narrative based assessment as well as how simulation and game based assessments serve both formative and summative purposes. Further, chapters address the critical challenge of integrating assessment directly into the learning process so that teacher effectiveness and student learning can be enhanced.

Two chapters specifically address the psychometric challenges related to innovative items. One chapter talks about evaluating the psychometric properties of innovative items while the other chapter presents a new psychometric model for calibrating innovative items embedded in multiple contexts. In addition, validity issues are addressed related to technology enhanced innovative assessment. It is hoped that the book provides readers with rich and useful information about the development of several types of virtual assessments from multiple perspectives. The authors include experts from industry where innovative items have been used for many years and experts from research institutes and universities who have done pioneering work related to developing innovative items with formative applications to facilitate learning. In addition, expert advice has been provided on validating such work.

Classroom Assessment and Educational Measurement explores the ways in which the theory and practice of both educational measurement and the assessment of student learning in classroom settings mutually inform one another. Chapters by assessment and measurement experts consider the nature of classroom assessment information, from student achievement to affective and socio-emotional attributes; how teachers interpret and work with assessment results; and emerging issues in assessment such as digital technologies and diversity/inclusion. This book uniquely considers the limitations of applying large-scale educational measurement theory to classroom assessment and the adaptations necessary to make this transfer useful. Researchers, graduate students, industry professionals, and policymakers will come away with an essential understanding of how the classroom assessment context is essential to

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broadening contemporary educational measurement perspectives.

Education is a hot topic. From the stage of presidential debates to tonight's dinner table, it is an issue that most Americans are deeply concerned about. While there are many strategies for improving the educational process, we need a way to find out what works and what doesn't work as well. Educational assessment seeks to determine just how well students are learning and is an integral part of our quest for improved education. The nation is pinning greater expectations on educational assessment than ever before. We look to these assessment tools when documenting whether students and institutions are truly meeting education goals. But we must stop and ask a crucial question: What kind of assessment is most effective? At a time when traditional testing is subject to increasing criticism, research suggests that new, exciting approaches to assessment may be on the horizon. Advances in the sciences of how people learn and how to measure such learning offer the hope of developing new kinds of assessments—assessments that help students succeed in school by making as clear as possible the nature of their accomplishments and the progress of their learning. *Knowing What Students Know* essentially explains how expanding knowledge in the scientific fields of human learning and educational measurement can form the foundations of an improved approach to assessment. These advances suggest ways that the targets of assessment—what students know and how well they know it—as well as the methods used to make inferences about student learning can be made more valid and instructionally useful. Principles for designing and using these new kinds of assessments are presented, and examples are used to illustrate the principles. Implications for policy, practice, and research are also explored. With the promise of a productive research-based approach to assessment of student learning, *Knowing What Students Know* will be important to education administrators, assessment designers, teachers and teacher educators, and education advocates.

In the music classroom, instructors who hope to receive aid are required to provide data on their classroom programs. Due to the lack of reliable, valid large-scale assessments of student achievement in music, however, music educators in schools that accept funds face a considerable challenge in finding a way to measure student learning in their classrooms. From Australia to Taiwan to the Netherlands, music teachers experience similar struggles in the quest for a definitive assessment resource that can be used by both music educators and researchers. In this two-volume *Handbook*, contributors from across the globe come together to provide an authority on the assessment, measurement, and evaluation of student learning in music. The *Handbook's* first volume emphasizes international and theoretical perspectives on music education assessment in the major world regions. This volume also looks at technical aspects of measurement in music, and outlines situations where theoretical foundations can be applied to the development of tests in music. The *Handbook's* second volume offers a series of practical and US-focused approaches to music education assessment.

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Chapters address assessment in different types of US classrooms; how to assess specific skills or requirements; and how assessment can be used in tertiary and music teacher education classrooms. Together, both volumes of The Oxford Handbook of Assessment in Music Education pave the way forward for music educators and researchers in the field.

In an era of curricular changes and experiments and high-stakes testing, educational measurement and evaluation is more important than ever. In addition to expected entries covering the basics of traditional theories and methods, other entries discuss important sociopolitical issues and trends influencing the future of that research and practice. Textbooks, handbooks, monographs and other publications focus on various aspects of educational research, measurement and evaluation, but to date, there exists no major reference guide for students new to the field. This comprehensive work fills that gap, covering traditional areas while pointing the way to future developments. Features: Nearly 700 signed entries are contained in an authoritative work spanning four volumes and available in choice of electronic and/or print formats. Although organized A-to-Z, front matter includes a Reader's Guide grouping entries thematically to help students interested in a specific aspect of education research, measurement, and evaluation to more easily locate directly related entries. (For instance, sample themes include Data, Evaluation, Measurement Concepts & Issues, Research, Sociopolitical Issues, Standards.) Back matter includes a Chronology of the development of the field; a Resource Guide to classic books, journals, and associations; and a detailed Index. Entries conclude with References/Further Readings and Cross References to related entries. The Index, Reader's Guide themes, and Cross References will combine to provide robust search-and-browse in the e-version.

This book introduces and explores major topics in contemporary educational measurement: criterion-referenced testing, item response theory (IRT), computer-based testing, cross-lingual and cross-cultural assessment, and accountability testing. Psychometric experts describe forward-looking measurement practices and provide a contextualized understanding of how and why they were developed, how they can be used, and where they may go in the future. In addition to presenting key concepts and formulas, the volume covers established and emerging applications and discusses recurrent challenges that require additional research. A helpful glossary of abbreviations is included. The book is grounded in the work of Ronald K. Hambleton.

The NCME Applications of Educational Measurement and Assessment series includes edited volumes designed to inform research-based applications of educational measurement and assessment. Edited by leading experts, these books are comprehensive and practical resources on the latest developments in the field.

This state-of-the-art resource brings together the most innovative scholars and thinkers in the field of testing to capture the changing conceptual, methodological, and applied landscape of cognitively-grounded educational assessments. Offers a methodologically-rigorous review of cognitive and learning sciences models for testing purposes, as well as the latest statistical and technological know-how for designing, scoring, and interpreting results Written by an international team of contributors at the cutting-edge of cognitive psychology and educational measurement under the editorship of a research director at the Educational Testing Service

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and an esteemed professor of educational psychology at the University of Alberta as well as supported by an expert advisory board Covers conceptual frameworks, modern methodologies, and applied topics, in a style and at a level of technical detail that will appeal to a wide range of readers from both applied and scientific backgrounds Considers emerging topics in cognitively-grounded assessment, including applications of emerging socio-cognitive models, cognitive models for human and automated scoring, and various innovative virtual performance assessments

This book provides a significant contribution to the increasing conversation concerning the place of big data in education. Offering a multidisciplinary approach with a diversity of perspectives from international scholars and industry experts, chapter authors engage in both research- and industry-informed discussions and analyses on the place of big data in education, particularly as it pertains to large-scale and ongoing assessment practices moving into the digital space. This volume offers an innovative, practical, and international view of the future of current opportunities and challenges in education and the place of assessment in this context.

The use of technology for workplace and occupational testing blossomed in the early years of this century. This book offers a demonstration that the first generation of these technologies have now been implemented long enough to observe the patterns and issues that emerge when these approaches evolve through technical advancement and successive application. A new set of issues and opportunities has emerged and the next generation of these applications is now coming of age. This book reflects on the last few decades of this evolutionary process from a vantage point of global experience across a wide range of workplace applications, including employment selection, development, and occupational certification. The themes and issues that arise as this broad treatment unfolds provide an essential foundation for students, researchers, and professionals who are involved with the assessment of human capability and potential in organizational and workplace contexts

This book presents the proceedings of the 1st EAI International Conference on Technology, Innovation, Entrepreneurship and Education (TIE 2017), which took place at Canterbury Christ Church University on September 11-12, 2017. The central theme of the conference is creativity and innovation, especially in relation to technology, business, education, social and political needs that make modern society flourish. The proceedings feature papers from a cross-disciplinary audience that explore the process of creativity and innovation. The goal is that the various disciplines can learn from each other and see how they might benefit from the cross-fertilization of practices.

This handbook brings together scholars from around the globe who here contribute to our understanding of how digital rhetoric is changing the landscape of writing. Increasingly, all of us must navigate networks of information, compose not just with computers but an array of mobile devices, increase our technological literacy, and understand the changing dynamics of authoring, writing, reading, and publishing in a world of rich and complex texts. Given such changes, and given the diverse ways in which younger generations of college students are writing, communicating, and designing texts in multimediated, electronic environments, we need to consider how the very act of writing itself is undergoing potentially fundamental changes. These changes are being addressed increasingly by the emerging field of digital rhetoric, a field that attempts to understand the rhetorical possibilities and affordances of writing, broadly defined, in a wide array of digital environments. Of interest to both researchers and students, this volume provides insights about the fields of rhetoric, writing, composition, digital media, literature, and multimodal studies.

The 5th edition of the prestigious AECT Handbook continues previous efforts to reach outside the traditional instructional design and technology community to the learning sciences and computer information systems communities toward developing a conceptualization of the field.

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However, given the pervasive and increasingly complex role technology now plays in education since the 1st edition of the Handbook in 1996, the editors have reorganized the research chapters in this edition to focus on the learning problems we are trying to solve with educational technologies, rather than to focus on the things we are using to solve those problems. Additionally, for the first time this edition of the Handbook reflects our field's growing understanding of the importance of design scholarship to inform practice by including design case chapters. These changes for this edition of the Handbook are intended to bring educational technology research into the broader framework of educational research by elaborating on the role instructional design and technology plays as a scholarly discipline in addressing education's increasingly complex issues. Provides comprehensive reviews of new developments in educational technology research and design practice. Includes concrete examples to guide future research and practice in the ways emerging technologies can be used to solve educational problems. Contains extensive references furnished to guide readers to the most recent research and design practice in the field of instructional design and technology.

When facilitating high-quality education, using digital technology to personalize students' learning is a focus in the development of instruction. There is a need to unify the multifaceted directions in personalized learning by presenting a coherent and organized vision in the design of personalized learning using digital technology. Digital Technologies and Instructional Design for Personalized Learning is a critical scholarly resource that highlights the theories, principles, and learning strategies in personalized learning with digital technology. Featuring coverage on a broad range of topics, such as collaborative learning, instructional design, and computer-supported collaborative learning, this book is geared towards educators, professionals, school administrators, academicians, researchers, and students seeking current research on the area of personalized learning with digital technology.

From cloud computing to data analytics, society stores vast supplies of information through wireless networks and mobile computing. As organizations are becoming increasingly more wireless, ensuring the security and seamless function of electronic gadgets while creating a strong network is imperative. Advanced Methodologies and Technologies in Network Architecture, Mobile Computing, and Data Analytics highlights the challenges associated with creating a strong network architecture in a perpetually online society. Readers will learn various methods in building a seamless mobile computing option and the most effective means of analyzing big data. This book is an important resource for information technology professionals, software developers, data analysts, graduate-level students, researchers, computer engineers, and IT specialists seeking modern information on emerging methods in data mining, information technology, and wireless networks.

In recent years, our world has experienced a profound shift and progression in available computing and knowledge sharing innovations. These emerging advancements have developed at a rapid pace, disseminating into and affecting numerous aspects of contemporary society. This has created a pivotal need for an innovative compendium encompassing the latest trends, concepts, and issues

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surrounding this relevant discipline area. During the past 15 years, the Encyclopedia of Information Science and Technology has become recognized as one of the landmark sources of the latest knowledge and discoveries in this discipline. The Encyclopedia of Information Science and Technology, Fourth Edition is a 10-volume set which includes 705 original and previously unpublished research articles covering a full range of perspectives, applications, and techniques contributed by thousands of experts and researchers from around the globe. This authoritative encyclopedia is an all-encompassing, well-established reference source that is ideally designed to disseminate the most forward-thinking and diverse research findings. With critical perspectives on the impact of information science management and new technologies in modern settings, including but not limited to computer science, education, healthcare, government, engineering, business, and natural and physical sciences, it is a pivotal and relevant source of knowledge that will benefit every professional within the field of information science and technology and is an invaluable addition to every academic and corporate library.

Advanced Methods in Automatic Item Generation is an up-to-date survey of the growing research on automatic item generation (AIG) in today's technology-enhanced educational measurement sector. As test administration procedures increasingly integrate digital media and Internet use, assessment stakeholders—from graduate students to scholars to industry professionals—have numerous opportunities to study and create different types of tests and test items. This comprehensive analysis offers thorough coverage of the theoretical foundations and concepts that define AIG, as well as the practical considerations required to produce and apply large numbers of useful test items.

Despite developments in research and practice on using examinee response process data in assessment design, the use of such data in test validation is rare. Validation of Score Meaning in the Next Generation of Assessments Using Response Processes highlights the importance of validity evidence based on response processes and provides guidance to measurement researchers and practitioners in creating and using such evidence as a regular part of the assessment validation process. Response processes refer to approaches and behaviors of examinees when they interpret assessment situations and formulate and generate solutions as revealed through verbalizations, eye movements, response times, or computer clicks. Such response process data can provide information about the extent to which items and tasks engage examinees in the intended ways. With contributions from the top researchers in the field of assessment, this volume includes chapters that focus on methodological issues and on applications across multiple contexts of assessment interpretation and use. In Part I of this book, contributors discuss the framing of validity as an evidence-based argument for the interpretation of the meaning of test scores, the specifics of different methods of response process data collection and analysis, and the use of response process data relative to issues of validation as

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highlighted in the joint standards on testing. In Part II, chapter authors offer examples that illustrate the use of response process data in assessment validation. These cases are provided specifically to address issues related to the analysis and interpretation of performance on assessments of complex cognition, assessments designed to inform classroom learning and instruction, and assessments intended for students with varying cultural and linguistic backgrounds.

From early answer sheets filled in with number 2 pencils, to tests administered by mainframe computers, to assessments wholly constructed by computers, it is clear that technology is changing the field of educational and psychological measurement. The numerous and rapid advances have immediate impact on test creators, assessment professionals, and those who implement and analyze assessments. This comprehensive new volume brings together leading experts on the issues posed by technological applications in testing, with chapters on game-based assessment, testing with simulations, video assessment, computerized test development, large-scale test delivery, model choice, validity, and error issues. Including an overview of existing literature and ground-breaking research, each chapter considers the technological, practical, and ethical considerations of this rapidly-changing area. Ideal for researchers and professionals in testing and assessment, *Technology and Testing* provides a critical and in-depth look at one of the most pressing topics in educational testing today.

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Integrating Timing Considerations to Improve Testing Practices synthesizes a wealth of theory and research on time issues in assessment into actionable advice for test development, administration, and scoring. One of the major advantages of computer-based testing is the capability to passively record test-taking metadata—including how examinees use time and how time affects testing outcomes. This has opened many questions for testing administrators. Is there a trade-off between speed and accuracy in test taking? What considerations should influence equitable decisions about extended-time accommodations? How can test administrators use timing data to balance the costs and resulting validity of tests administered at commercial testing centers? In this comprehensive volume, experts in the field discuss the impact of timing considerations, constraints, and policies on valid score interpretations; administrative accommodations, test construction, and examinees' experiences and behaviors; and how to implement the findings into practice. These 12 chapters provide invaluable resources for testing professionals to better understand the inextricable links between effective time allocation and the purposes of high-stakes testing.

Psychological Testing: A Practical Introduction 4e offers students of psychology and allied disciplines a comprehensive survey of psychometric principles and tests in the major categories of applied assessment. Coverage includes test norms, reliability, validity, and test

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development, with an entirely new chapter on test fairness and bias. Chapters on assessment of cognitive ability, achievement, personality, clinical instruments, and attitudes provide up-to-date examples of the widely used tests in each category. Recognizing that active engagement maximizes learning, the text presents as an active learning device rather than a reference work. Extensive use of chapter objectives, key point and end-of-chapter summaries, practice problems, applied scenarios, internet-based resources, and statistics skills review enable students to engage more fully with the material for a deeper understanding. Written in a clear, reader-friendly style, the text approaches challenging topics by balancing technical rigor with relatable examples of contemporary applications.

Recent innovations and new technologies in education have altered the way teachers approach instruction and learning and can provide countless advantages. The pedagogical value of specific technology tools and the cumulative effects of technology exposure on student learning over time are two areas that need to be explored to better determine the improvements needed in the modern classroom. *Advanced Methodologies and Technologies in Modern Education Delivery* provides emerging research on educational models in the continually improving classroom. While highlighting the challenges facing modern in-service and pre-service teachers when educating students, readers will learn information on new methods in curriculum development, instructional design, and learning assessments to implement within their classrooms. This book is a vital resource for pre-service and in-service teachers, teacher education professionals, higher education administrative professionals, and researchers interested in new curriculum development.

An enduring educational concern that has plagued researchers and policy makers in a number of affluent countries is the endemic nature of educational inequalities. These inequalities highlight distinct differences in the educational skills, knowledge, capabilities and credentials between learners' demographic characteristics. They also point to issues of educational disadvantage that emanate from a combination of factors including family life, communities, the geographies of space and place, gender and ethnicity. This book examines some of the causes and responses to educational inequalities, and focuses upon poor urban contexts where educational disadvantage is at its most concentrated, and where educational policy and practice has, over time, proliferated. It questions how wider inequities experienced by young people in urban contexts generate educational inequalities and disadvantage, detailing explicitly what an equitable approach to education might look like. Included in the book is an innovative educational equity framework and toolkit with illustrative policy and practice case studies, bringing together unique scholarship and analysis to examine future educational policy in a holistic, comprehensive and equitable way. It will be valuable reading for postgraduate students, researchers and policy makers with an interest in education and educational equity. State education departments and school districts face an important challenge in implementing a new law that requires disadvantaged students to be held to the same standards as other students. The new requirements come from provisions of the 1994 reauthorization of Title I, the largest federal effort in precollegiate education, which provides aid to "level the field" for disadvantaged students. *Testing, Teaching, and Learning* is written to help states and school districts comply with the new law, offering guidance for designing and implementing assessment and accountability systems. This book examines standards-based education reform and reviews the research on student assessment, focusing on the needs of disadvantaged students covered by Title I. With examples of states and districts that have track records in new systems, the committee develops a practical "decision framework" for education officials. The book explores how best to design assessment and accountability systems that support high levels of student learning and to work toward continuous improvement. *Testing, Teaching, and Learning* will be an important tool for all involved in educating disadvantaged students—state and local administrators and classroom teachers.

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In recent years there have been increasing efforts to use accountability systems based on large-scale tests of students as a mechanism for improving student achievement. The federal No Child Left Behind Act (NCLB) is a prominent example of such an effort, but it is only the continuation of a steady trend toward greater test-based accountability in education that has been going on for decades. Over time, such accountability systems included ever-stronger incentives to motivate school administrators, teachers, and students to perform better. *Incentives and Test-Based Accountability in Education* reviews and synthesizes relevant research from economics, psychology, education, and related fields about how incentives work in educational accountability systems. The book helps identify circumstances in which test-based incentives may have a positive or a negative impact on student learning and offers recommendations for how to improve current test-based accountability policies. The most important directions for further research are also highlighted. For the first time, research and theory on incentives from the fields of economics, psychology, and educational measurement have all been pulled together and synthesized. *Incentives and Test-Based Accountability in Education* will inform people about the motivation of educators and students and inform policy discussions about NCLB and state accountability systems. Education researchers, K-12 school administrators and teachers, as well as graduate students studying education policy and educational measurement will use this book to learn more about the motivation of educators and students. Education policy makers at all levels of government will rely on this book to inform policy discussions about NCLB and state accountability systems.

These research articles from the 79th Annual Meeting of the Psychometric Society (IMPS) cover timely quantitative psychology topics, including new methods in item response theory, computerized adaptive testing, cognitive diagnostic modeling, and psychological scaling. Topics within general quantitative methodology include structural equation modeling, factor analysis, causal modeling, mediation, missing data methods, and longitudinal data analysis. These methods will appeal, in particular, to researchers in the social sciences. The 79th annual meeting took place in Madison, WI between July 21nd and 25th, 2014. Previous volumes to showcase work from the Psychometric Society's Meeting are *New Developments in Quantitative Psychology: Presentations from the 77th Annual Psychometric Society Meeting* (Springer, 2013) and *Quantitative Psychology Research: The 78th Annual Meeting of the Psychometric Society* (Springer, 2015).?

First released in the Spring of 1999, *How People Learn* has been expanded to show how the theories and insights from the original book can translate into actions and practice, now making a real connection between classroom activities and learning behavior. This edition includes far-reaching suggestions for research that could increase the impact that classroom teaching has on actual learning. Like the original edition, this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do-with curricula, classroom settings, and teaching methods--to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. *How People Learn* examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly entrenched in our current education system. Topics include: How learning actually changes the physical structure of the brain. How existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and

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opportunities for teachers. A realistic look at the role of technology in education.

"Automated scoring engines [...] require a careful balancing of the contributions of technology, NLP, psychometrics, artificial intelligence, and the learning sciences. The present handbook is evidence that the theories, methodologies, and underlying technology that surround automated scoring have reached maturity, and that there is a growing acceptance of these technologies among experts and the public." From the Foreword by Alina von Davier, ACTNext Senior Vice President Handbook of Automated Scoring: Theory into Practice provides a scientifically grounded overview of the key research efforts required to move automated scoring systems into operational practice. It examines the field of automated scoring from the viewpoint of related scientific fields serving as its foundation, the latest developments of computational methodologies utilized in automated scoring, and several large-scale real-world applications of automated scoring for complex learning and assessment systems. The book is organized into three parts that cover (1) theoretical foundations, (2) operational methodologies, and (3) practical illustrations, each with a commentary. In addition, the handbook includes an introduction and synthesis chapter as well as a cross-chapter glossary.

This book is open access under a CC BY-NC 2.5 license.?? This book describes the extensive contributions made toward the advancement of human assessment by scientists from one of the world's leading research institutions, Educational Testing Service. The book's four major sections detail research and development in measurement and statistics, education policy analysis and evaluation, scientific psychology, and validity. Many of the developments presented have become de-facto standards in educational and psychological measurement, including in item response theory (IRT), linking and equating, differential item functioning (DIF), and educational surveys like the National Assessment of Educational Progress (NAEP), the Programme of international Student Assessment (PISA), the Progress of International Reading Literacy Study (PIRLS) and the Trends in Mathematics and Science Study (TIMSS). In addition to its comprehensive coverage of contributions to the theory and methodology of educational and psychological measurement and statistics, the book gives significant attention to ETS work in cognitive, personality, developmental, and social psychology, and to education policy analysis and program evaluation. The chapter authors are long-standing experts who provide broad coverage and thoughtful insights that build upon decades of experience in research and best practices for measurement, evaluation, scientific psychology, and education policy analysis. Opening with a chapter on the genesis of ETS and closing with a synthesis of the enormously diverse set of contributions made over its 70-year history, the book is a useful resource for all interested in the improvement of human assessment.

The papers in this collection were commissioned by the Board on Testing and Assessment (BOTA) of the National Research Council (NRC) for a workshop held on November 14, 2001, with support from the William and Flora Hewlett Foundation. Goals for the workshop were twofold. One was to share the major messages of the recently released NRC committee report, *Knowing What Students Know: The Science and Design of Educational Assessment* (2001), which synthesizes advances in the cognitive sciences and methods of

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measurement, and considers their implications for improving educational assessment. The second goal was to delve more deeply into one of the major themes of that report—the role that technology could play in bringing those advances together, which is the focus of these papers. For the workshop, selected researchers working in the intersection of technology and assessment were asked to write about some of the challenges and opportunities for more fully capitalizing on the power of information technologies to improve assessment, to illustrate those issues with examples from their own research, and to identify priorities for research and development in this area.

Americans have adopted a reform agenda for their schools that calls for excellence in teaching and learning. School officials across the nation are hard at work targeting instruction at high levels for all students. Gaps remain, however, between the nation's educational aspirations and student achievement. To address these gaps, policy makers have recently focused on the qualifications of teachers and the preparation of teacher candidates. This book examines the appropriateness and technical quality of teacher licensure tests currently in use, evaluates the merits of using licensure test results to hold states and institutions of higher education accountable for the quality of teacher preparation and licensure, and suggests alternatives for developing and assessing beginning teacher competence. Teaching is a complex activity. Definitions of quality teaching have changed and will continue to change over time as society's values change. This book provides policy makers, teacher testers, and teacher educators with advice on how to use current tests to assess teacher candidates and evaluate teacher preparation, ensuring that America's youth are being taught by the most qualified candidates.

The capabilities and possibilities of emerging game-based learning technologies bring about a new perspective of learning and instruction. This, in turn, necessitates alternative ways to assess the kinds of learning that are taking place in the game-based environments. The field has been broadening the focus of assessment in game environments (i.e., what we measure), developing processes and methodologies that go beyond psychometrics practices (i.e., how we go about assessment in games), and implementing the game-based assessment (GBA) in real contexts. The current state of the field calls for a revisit of this topic to understand what we have learned from the research on this topic, and how the GBA work changed how the field thinks about assessment beyond game environments. Accordingly, this comprehensive volume covers the current state of research, methodology, and technology of game-based assessment. It features four major themes: what we are measuring in games, how GBA has influenced how people do assessment beyond games, new methods and practices, and implementations of GBA. The audience for this volume includes researchers, graduate students, teachers, and professional practitioners in the areas of education, instructional design, educational psychology, academic and organizational development, and instructional technology.

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Devising tests that evaluate a nation's educational standing and implement efficacious educational reforms requires a careful balance among the contributions of technology, psychometrics, test design, and the learning sciences. Unlike other forms of adaptive testing, multistage testing (MST) is highly suitable for testing educational achievement because it can be adapted to educational surveys and student testing. *Computerized Multistage Testing: Theory and Applications* covers the methodologies, underlying technology, and implementation aspects of this type of test design. The book discusses current scientific perspectives and practical considerations for each step involved in setting up an MST program. It covers the history of MST, test design and implementation for various purposes, item pool development and maintenance, IRT-based and classical test theory-based methodologies for test assembly, routing and scoring, equating, test security, and existing software. It also explores current research, existing operational programs, and innovative future assessments using MST. Intended for psychologists, social scientists, and educational measurement scientists, this volume provides the first unified source of information on the design, psychometrics, implementation, and operational use of MST. It shows how to apply theoretical statistical tools to testing in novel and useful ways. It also explains how to explicitly tie the assumptions made by each model to observable (or at least inferable) data conditions. Winner of the 2016 AERA Award for Significant Contribution to Educational Measurement and Research Methodology The 2016 American Education Research Association (AERA) Div. D award committee for Significant Contributions to Educational Measurement and Research Methodology has recognized unanimously this collaborative work advancing the theory and applications of computerized MST. This annual award recognizes published research judged to represent a significant conceptual advancement in the theory and practice of educational measurement and/or educational research methodology. The 2016 award was made under the heading: Measurement, Psychometrics, and Assessment. This collective work, published in 2014 as an edited volume titled *Computerized Multistage Testing: Theory and Applications*, was cited by the committee both for the originality of the conceptual foundations presented in support of multistage testing and for arguing persuasively for its potential impact on the practice of educational measurement.

Under pressure and support from the federal government, states have increasingly turned to indicators based on student test scores to evaluate teachers and schools, as well as students themselves. The focus thus far has been on test scores in those subject areas where there is a sequence of consecutive tests, such as in mathematics or English/language arts with a focus on grades 4-8. Teachers in these subject areas, however, constitute less than thirty percent of the teacher workforce in a district. Comparatively little has been written about the measurement of achievement in the other grades and subjects. This volume seeks to remedy this imbalance by focusing on the assessment of

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student achievement in a broad range of grade levels and subject areas, with particular attention to their use in the evaluation of teachers and schools in all. It addresses traditional end-of-course tests, as well as alternative measures such as portfolios, exhibitions, and student learning objectives. In each case, issues related to design and development, psychometric considerations, and validity challenges are covered from both a generic and a content-specific perspective. The NCME Applications of Educational Measurement and Assessment series includes edited volumes designed to inform research-based applications of educational measurement and assessment. Edited by leading experts, these books are comprehensive and practical resources on the latest developments in the field. The NCME series editorial board is comprised of Michael J. Kolen, Chair; Robert L. Brennan; Wayne Camara; Edward H. Haertel; Suzanne Lane; and Rebecca Zwick.

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