

## Technology Based Assessments For 21st Century Skills Theoretical And Practical Implications From Modern Research Current Perspectives On Cognition Learning And Instruction

A comprehensive textbook that overviews common technologies utilized within the homeland security enterprise with an emphasis on contemporary homeland security mission areas and end-user applications. • Provides an overview of technology trends and transformations from the viewpoint of contemporary homeland security mission areas and user applications as well as analysis of the impacts on contemporary and future homeland security practices • Comprehensively addresses the opportunities and risks associated with homeland security technologies • Supplies a taxonomy for homeland security technology types • Describes the methodologies for identifying technology needs and characteristics • Itemizes standards for promoting interoperability, compatibility, and system safety

An extensive review of the literature on learning assessment in informal settings, expert discussion of key issues, and a new model for good assessment practice.

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.

Creative problem solving, collaboration, and technology fluency are core skills requisite of any nation's workforce that strives to be competitive in the 21st Century. Teaching these types of skills is an economic imperative, and assessment is a fundamental component of any pedagogical program. Yet, measurement of these skills is complex due to the interacting factors associated with higher order thinking and multifaceted communication. Advances in assessment theory, educational psychology, and technology create an opportunity to innovate new methods of measuring students' 21st Century Skills with validity, reliability, and scalability. In this book, leading scholars from multiple disciplines present their latest research on how to best measure complex knowledge, skills, and abilities using technology-based assessments. All authors discuss theoretical and practical implications from their research and outline their visions for the future of technology-based assessments.

Teaching and Measuring Cognitive Readiness presents theoretical and empirical findings regarding cognitive readiness and assessments of their impact on adult learning. The term readiness is used in assessing student preparation for K-12 schools, while in the military and in industry, "readiness" denotes preparation to be effective in performing a mission or a job. Cognitive Readiness is viewed through a Knowledge, Skills, and Attributes (KSA) lens. Teaching and Measuring Cognitive Readiness deals with (a) the primacy of cognitive readiness as attributes or individual difference variables; (b) the need for cognitive readiness instructional and assessment strategies; (c) the need to integrate assessment into cognitive readiness training; (d) the need for theory-driven evaluation studies to increase knowledge and efficacy in teaching cognitive readiness; and (e) the need for a solid psychometric approach to the use of cognitive readiness assessments.

Presenting original studies and rich conceptual analyses, this volume reports on theoretical issues involved in the use of simulations and games in educational assessment. Chapters consider how technologies can be used to effectively assess, modify, and enhance learning and assessment in education and training. By highlighting theoretical issues arising from the use of games and simulations as assessment tools for selection and classification, training, and evaluation across educational and workplace contexts, the volume offers both broad conceptual views on assessment, as well as rich descriptions of various, context-specific applications. Through a focus that includes both quantitative and qualitative approaches, policy implications, meta-analysis, and constructs, the volume highlights commonalities and divergence in theoretical research being conducted in relation to K-12, post-secondary, and military education and assessment. In doing so, the collection enhances understanding of how games and simulations can intersect with the science of learning to improve educational outcomes. Given its rigorous and multidisciplinary approach, this book will prove an indispensable resource for researchers and scholars in the fields of educational assessment and evaluation, educational technology, military psychology, and educational psychology.

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 is taking place in the virtual worlds or informal settings. accordingly, aligning learning and assessment is the core for creating a favorable and effective learning environment. The edited volume will cover the current state of research, methodology, assessment, and technology of game-based learning. There will be contributions from international distinguished researchers which will present innovative work in the areas of educational psychology, educational diagnostics, educational technology, and learning sciences. The edited volume will be divided into four major parts.

Solving non-routine problems is a key competence in a world full of changes, uncertainty and surprise where we strive to achieve so many ambitious goals. But the world is also full of solutions because of the extraordinary competences of humans who search for and find them. The Sage Handbook of Research on Classroom Assessment provides scholars, professors, graduate students, and other researchers and policy makers in the organizations, agencies, testing companies, and school districts with a comprehensive source of research on all aspects of K-12 classroom assessment. The handbook emphasizes theory, conceptual frameworks, and all varieties of research (quantitative, qualitative, mixed methods) to provide an in-depth understanding of the knowledge base in each area of classroom assessment and how to conduct inquiry in the area. It presents classroom assessment research to convey, in depth, the state of knowledge and understanding that is represented by the research, with particular emphasis on how classroom assessment practices affect student achievement and teacher behavior. Editor James H. McMillan and five Associate Editors bring the best thinking and analysis from leading classroom assessment researchers on the nature of the research, making significant contributions to this prominent and hotly debated topic in education.

Many different cognitive research approaches have been generated to explore fields of practice where mutual teamwork is present and emergent. Results have shown subtle yet significant findings on how humans actually work together and when they transition from their own individual roles and niches into elements of teamwork and team-to-team work. Fields of Practice and Applied Solutions within Distributed Team Cognition explores the advantages of teams and shows how researchers can obtain a deep understanding of users/teams that are entrenched in a particular field. Interdisciplinary perspectives and transformative intersections are provided. Features Delineates contextual nuances of socio-technical environments as influencers of team cognition Provides quantitative/qualitative perspectives of distributed team cognition by demonstrating in situ interactions Reviews applied teamwork for fields of practice in medicine, cybersecurity, education, aviation,

and manufacturing Generates practical examples of distributed work and how cognition develops across teams using technologies Specifies applied solutions through technologies such as robots, agents, games, and social networks

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 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

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 focuses on the uses of big data in the context of higher education. The book describes a wide range of administrative and operational data gathering processes aimed at assessing institutional performance and progress in order to predict future performance, and identifies potential issues related to academic programming, research, teaching and learning?. Big data refers to data which is fundamentally too big and complex and moves too fast for the processing capacity of conventional database systems. The value of big data is the ability to identify useful data and turn it into useable information by identifying patterns and deviations from patterns?.

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 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.

This Springer Brief provides theory, practical guidance, and support tools to help designers create complex, valid assessment tasks for hard-to-measure, yet crucial, science education standards. Understanding, exploring, and interacting with the world through models characterizes science in all its branches and at all levels of education. Model-based reasoning is central to science education and thus science assessment. Current interest in developing and using models has increased with the release of the Next Generation Science Standards, which identified this as one of the eight practices of science and engineering. However, the interactive, complex, and often technology-based tasks that are needed to assess model-based reasoning in its fullest forms are difficult to develop. Building on research in assessment, science education, and learning science, this Brief describes a suite of design patterns that can help assessment designers, researchers, and teachers create tasks for assessing aspects of model-based reasoning: Model Formation, Model Use, Model Elaboration, Model Articulation, Model Evaluation, Model Revision, and Model-Based Inquiry. Each design pattern lays out considerations concerning targeted knowledge and ways of capturing and evaluating students' work. These design patterns are available at [http://design-drk.padi.sri.com/padi/do/NodeAction?state=listNodes&NODE\\_TYPE=PARADIGM\\_TYPE](http://design-drk.padi.sri.com/padi/do/NodeAction?state=listNodes&NODE_TYPE=PARADIGM_TYPE). The ideas are illustrated with examples from existing assessments and the research literature.

The key question this book addresses is how to identify and create optimal conditions for the kind of learning and development that is especially important for effectively functioning in the 21st century. Taking a new approach to this long-debated issue, it looks at how a design research-based science of learning (with its practical models and related design research) can provide insights and integrated models of how human beings actually function and grow in the social dynamics of educational settings with all their affordances and constraints. More specifically: How can specific domains or subject matters be taught for broad intellectual development? How can technology be integrated in enhancing human functioning? How can the social organization of classroom learning be optimized to create social norms for promoting deep intellectual engagement and personal growth? Part I is concerned with broad conceptual and technical issues regarding cultivating intellectual potential, with a focus on how design research might fill in an important a niche in addressing these issues. Part II presents specific design work in terms of design principles, models, and prototypes.

When should children begin their digital diet? Does the use of new technology hinder or enhance children's literacy development? Do new technologies give children new abilities or undermine their skills and identities? Are learners safe in modern online educational spaces? Kieron Sheehy and Andrew Holliman have assembled expert contributors from around the world to discuss these questions and have divided the book into three parts: early engagement with new technologies: decisions, dangers and data new technology: supporting all learners or divisive tools global and cultural reflections on educational technology. *Education and New Technologies* focuses on aspects of education where the use of twenty-first-century technologies has been particularly controversial, contemplating the possible educational benefits alongside potential negative impacts on learners. Topics covered include: e-books and their influence on literacy skills games-based learning the impact of new technologies on abilities and disabilities learning analytics and the use of large-scale learner data cyberbullying intelligent technologies and the connected learner. A twenty-first-century book for twenty-first-century concerns, *Education and New Technologies* presents up-to-date research and clear, engaging insight about the relationship between technology and how we learn.

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.

The third edition of the Handbook of Educational Psychology is sponsored by Division 15 of the American Psychological Association. In this volume, thirty chapters address new developments in theory and research methods while honoring the legacy of the field's past. A diverse group of recognized scholars within and outside the U.S. provide integrative reviews and critical syntheses of developments in the substantive areas of psychological inquiry in education, functional processes for learning, learner readiness and development, building knowledge and subject matter expertise, and the learning and task environment. New chapters in this edition cover topics such as learning sciences research, latent variable models, data analytics, neuropsychology, relations between emotion, motivation, and volition (EMOVO), scientific literacy, sociocultural perspectives on learning, dialogic instruction, and networked learning. Expanded treatment has been given to relevant individual differences, underlying processes, and new research on subject matter acquisition. The Handbook of Educational Psychology, Third Edition, provides an indispensable reference volume for scholars in education and the learning sciences, broadly conceived, as well as for teacher educators, practicing teachers, policy makers and the academic libraries serving these audiences. It is also appropriate for graduate level courses in educational psychology, human learning and motivation, the learning sciences, and psychological research methods in education and psychology.

Performance-based assessments allow classroom teachers an alternative to traditional multiple-choice tests. We often use fill-in-the bubble assessments in education to determine the readiness of students. However, in the 21st-century workplace, these types of tests fail to truly prepare students. How many times in the real world are we called upon to take a multiple-choice test? In the real world, we are called upon to prove our merit through performance-based assessments, displaying our 21st-century skills. We should be preparing students for this in the classroom. Performance-Based Assessment for 21st-Century Skills makes the argument that teachers should use performance-based assessments in the classroom. It guides the educator step by step to show how he or she can create performance-based assessments for students, including what they look like, teaching students how to create them, setting the proper classroom environment, and how to evaluate them.

There are many reasons to be curious about the way people learn, and the past several decades have seen an explosion of research that has important implications for individual learning, schooling, workforce training, and policy. In 2000, *How People Learn: Brain, Mind, Experience, and School: Expanded Edition* was published and its influence has been wide and deep. The report summarized insights on the nature of learning in school-aged children; described principles for the design of effective learning environments; and provided examples of how that could be implemented in the classroom. Since then, researchers have continued to investigate the nature of learning and have generated new findings related to the neurological processes involved in learning, individual and cultural variability related to learning, and educational technologies. In addition to expanding scientific understanding of the mechanisms of learning and how the brain adapts throughout the lifespan, there have been important discoveries about influences on learning, particularly sociocultural factors and the structure of learning environments. *How People Learn II: Learners, Contexts, and Cultures* provides a much-needed update incorporating insights gained from this research over the past decade. The book expands on the foundation laid out in the 2000 report and takes an in-depth look at the constellation of influences that affect individual learning. *How People Learn II* will become an indispensable resource to understand learning throughout the lifespan for educators of students and adults.

This volume provides a contemporary glance at the drastically expanding field of delivering large-scale education to unprecedented numbers of learners. It compiles papers presented at the CELDA (Cognition and Exploratory Learning in the Digital Age) conference, which has a goal of continuing to address these challenges and promote the effective use of new tools and technologies to support teaching, learning and assessment. Given the emerging global trend to exploit the potential of existing digital technologies to improve the teaching, learning and assessment experiences for all learners in real-life contexts, this topic is a unifying theme for this volume. The book showcases how emerging educational technologies and innovative practices have been used to address core global educational challenges. It provides state-of-the-art insights and case studies of exploiting innovative learning technologies, including Massive Open Online Courses and educational data analytics, to address key global challenges spanning from online Teacher Education to large-scale coding competence development. This volume will be of interest to academics and professional practitioners working in the area of digital technology integration in teaching, learning and assessment, as well as those interested in specific conference themes (e.g., designing and assessing learning in online environments, assessing learning in complex domains) and presenters, invited speakers, and participants of the CELDA conference.

This volume focuses on the implications of digital technologies for educators and educational decision makers that is not widely represented in the literature. While there are many volumes on how one might integrate a particular technology, there are no volumes on how digital technologies can or should be exploited to address the needs and propel the benefits of large-scale teaching, learning and assessment.

The volume consists of twenty-five chapters selected from among peer-reviewed papers presented at the CELDA (Cognition and Exploratory Learning in the Digital Age) 2013 Conference held in Fort Worth, Texas, USA, in October 2013 and also from world class scholars in e-learning systems, environments and approaches. The following sub-topics are included: Exploratory Learning Technologies (Part I), e-Learning social web design (Part II), Learner communities through e-Learning implementations (Part III), Collaborative and student-centered e-Learning design (Part IV). E-Learning has been, since its initial stages, a synonym for flexibility. While this dynamic nature has mainly been associated with time and space it is safe to argue that currently it embraces other aspects such as the learners' profile, the scope of subjects that can be taught electronically and the technology it employs. New technologies also widen the range of activities and skills developed in e-Learning. Electronic learning environments have evolved past the exclusive delivery of knowledge. Technology has endowed e-Learning with the possibility of remotely fomenting problem solving skills, critical thinking and team work, by investing in information exchange, collaboration, personalisation and community building.

Creative problem solving, collaboration, and technology fluency are core skills requisite of any nation's workforce that strives to be competitive in the 21st Century. Teaching these types of skills is an economic imperative, and assessment is a fundamental component of any pedagogical program. Yet, measurement of these skills is complex due to the interacting factors associated with higher order thinking and multifaceted communication. Advances in assessment theory, educational psychology, and technology create an opportunity to innovate new methods of measuring students' 21st Century Skills with validity, reliability, and scalability. In this book, leading scholars from multiple disciplines present their latest research on how to best measure complex knowledge, skills, and abilities using technology-based assessments. All authors discuss theoretical and practical implications from their research and outline their visions for the future of technology-based assessments.

The ever-growing creation of new internet technologies has led to a growing trend and use of scenario-based virtual environments

and serious games in education. Along with these new technologies, there is an increasing interest in how students can be effectively assessed when using these virtual environments. Cases on the Assessment of Scenario and Game-Based Virtual Worlds in Higher Education is a comprehensive collection that provides aspects of assessment in virtual worlds combined with lessons learned from critical reflection. These case studies present successes, challenges, and innovations to be utilized as a framework for practitioners and researchers to base their own effective forms of scenario-based learning. This publication would be of particular interest to practice-based disciplines such as education, nursing, medicine, and social work.

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.

The routine jobs of yesterday are being replaced by technology and/or shipped off-shore. In their place, job categories that require knowledge management, abstract reasoning, and personal services seem to be growing. The modern workplace requires workers to have broad cognitive and affective skills. Often referred to as "21st century skills," these skills include being able to solve complex problems, to think critically about tasks, to effectively communicate with people from a variety of different cultures and using a variety of different techniques, to work in collaboration with others, to adapt to rapidly changing environments and conditions for performing tasks, to effectively manage one's work, and to acquire new skills and information on one's own. The National Research Council (NRC) has convened two prior workshops on the topic of 21st century skills. The first, held in 2007, was designed to examine research on the skills required for the 21st century workplace and the extent to which they are meaningfully different from earlier eras and require corresponding changes in educational experiences. The second workshop, held in 2009, was designed to explore demand for these types of skills, consider intersections between science education reform goals and 21st century skills, examine models of high-quality science instruction that may develop the skills, and consider science teacher readiness for 21st century skills. The third workshop was intended to delve more deeply into the topic of assessment. The goal for this workshop was to capitalize on the prior efforts and explore strategies for assessing the five skills identified earlier. The Committee on the Assessment of 21st Century Skills was asked to organize a workshop that reviewed the assessments and related research for each of the five skills identified at the previous workshops, with special attention to recent developments in technology-enabled assessment of critical thinking and problem-solving skills. In designing the workshop, the committee collapsed the five skills into three broad clusters as shown below: Cognitive skills: nonroutine problem solving, critical thinking, systems thinking Interpersonal skills: complex communication, social skills, team-work, cultural sensitivity, dealing with diversity Intrapersonal skills: self-management, time management, self-development, self-regulation, adaptability, executive functioning Assessing 21st Century Skills provides an integrated summary of the presentations and discussions from both parts of the third workshop.

This book introduces the advanced technologies used for authentic learning, an educational term that refers to a variety of techniques focusing on how students apply the skills and knowledge acquired in school in real-world situations. In the meanwhile, it presents the latest trends and future developments in learning design, learning environment and assessment for authentic learning using advances in technology, this book discusses how technology supports authentic learning and what makes it effective.

This text provides an innovative new framework for the formative and holistic assessment of students' digital writing. It also addresses the rapid evolution of writing assessment tools, analyzing the research in clear terms for both techno-phobic and techno-savvy teachers. The author critiques computer automated scoring of student writing, for example, but also considers the possibilities and potential of the future of technology assisted assessments.

Ten Steps to Complex Learning presents a path from an educational problem to a solution in a way that students, practitioners, and researchers can understand and easily use. Students in the field of instructional design can use this book to broaden their knowledge of the design of training programs for complex learning. Practitioners can use this book as a reference guide to support their design of courses, curricula, or environments for complex learning. Now fully revised to incorporate the most current research in the field, this third edition of Ten Steps to Complex Learning includes many references to recent research as well as two new chapters. One new chapter deals with the training of 21st-century skills in educational programs based on the Ten Steps. The other deals with the design of assessment programs that are fully aligned with the Ten Steps. In the closing chapter, new directions for the further development of the Ten Steps are discussed.

Faculty development is currently practiced in a variety of approaches by individuals, committees, and centers of excellence. More research is needed to draw better benefit from these approaches in the impending digital world by taking advantage of digitally enabled teaching and learning. The Handbook of Research on Faculty Development for Digital Teaching and Learning offers holistic and multidisciplinary approaches to enhancing faculty effectiveness in teaching, boosting motivation, extending knowledge, expanding teaching behaviors, and disseminating skills in digital higher education settings. Featuring a broad range of topics such as faculty learning communities (FLCs), virtual learning environments, and professional development, this book is ideal for educators, educational technologists, curriculum developers, higher education staff, school administrators, principals, academicians, practitioners, and graduate students.

Education is expanding to include a stronger focus on the practical application of classroom lessons in an effort to prepare the next generation of scholars for a changing world economy centered on collaborative and problem-solving skills for the digital age. The Handbook of Research on Technology Tools for Real-World Skill Development presents comprehensive research and discussions on the importance of practical education focused on digital literacy and the problem-solving skills necessary in everyday life.

Featuring timely, research-based chapters exploring the broad scope of digital and computer-based learning strategies including, but not limited to, enhanced classroom experiences, assessment programs, and problem-solving training, this publication is an essential reference source for academicians, researchers, professionals, and policymakers interested in the practical application of

technology-based learning for next-generation education.

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 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.

Rapid—and seemingly accelerating—changes in the economies of developed nations are having a proportional effect on the skill sets required of workers in many new jobs. Work environments are often technology-heavy, while problems are frequently ill-defined and tackled by multidisciplinary teams. This book contains insights based on research conducted as part of a major international project supported by Cisco, Intel and Microsoft. It faces these new working environments head-on, delineating new ways of thinking about '21st-century' skills and including operational definitions of those skills. The authors focus too on fresh approaches to educational assessment, and present methodological and technological solutions to the barriers that hinder ICT-based assessments of these skills, whether in large-scale surveys or classrooms. Equally committed to defining its terms and providing practical solutions, and including international perspectives and comparative evaluations of assessment methodology and policy, this volume tackles an issue at the top of most educationalists' agendas.

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