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Enhancing Effective Instruction and Learning Using Assessment Data

Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland

2022. Paperback 978-1-64802-626-3 \$45.99. Hardcover 978-1-64802-627-0 \$85.99. eBook 978-1-64802-628-7 \$74.

This book introduces theories and practices for using assessment data to enhance learning and instruction. Topics include reshaping the homework review process, iterative learning engineering, learning progressions, learning maps, score report designing, the use of psychosocial data, and the combination of adaptive testing and adaptive learning. In addition, studies proposing new methods and strategies, technical details about the collection and maintenance of process data, and examples illustrating proposed methods and software are included.

Chapters 1, 4, 6, 8, and 9 discuss how to make valid interpretations of results and achieve more efficient instructions from various sources of data. Chapters 3 and 7 propose and evaluate new methods to promote students' learning by using evidence-based iterative learning engineering and supporting the teachers' use of assessment data, respectively. Chapter 2 provides technical details on the collection, storage, and security protection of process data. Chapter 5 introduces software for automating some aspects of developmental education and the use of predictive modeling. Chapter 10 describes the barriers to using psychosocial data for formative assessment purposes. Chapter 11 describes a conceptual framework for adaptive learning and testing and gives an example of a functional learning and assessment system.

In summary, the book includes comprehensive perspectives of the recent development and challenges of using test data for formative assessment purposes. The chapters provide innovative theoretical frameworks, new perspectives on the use of data with technology, and how to build new methods based on existing theories. This book is a useful resource to researchers who are interested in using data and technology to inform decision making, facilitate instructional utility, and achieve better learning outcomes.

CONTENTS: Technology Enhanced Formative Assessment Increases the Efficacy of the Homework Review Process, *Kim Kelly and Neil Heffernan*. Collection of Process Data in Web-Based Assessment Systems and Its Applications to Validating Noncognitive Constructs, *Alex Brodersen, Matthew F. Carter, Cheng Liu, and Ying Cheng*. Iterative Online Course Engineering Using Reinforcement Learning With Students' Performance Profile, *Machi Shimmei and Noboru Matsuda*. The Promise of Learning Progressions-Based Classroom Assessments to Improve Instruction, *Leanne R. Ketterlin-Geller and Robyn K. Pinilla*. The Use of Predictive Modeling for Assessing College Readiness, *Jason M. Bryer, Diana Akhmedjanova, Heidi L. Andrade, and Angela M. Lui*. Designing Score Reports to Maximize Validity and Instructional Utility, *Karen Barton and Audra Kosh*. The Effects of a Formative Assessment Intervention on Teacher and Student Understanding of Basic Mathematical Principles, *Julia Phelan, Kilchan Choi, Terry Vendlinski, Eva Baker, and Joan Herman*. On Determining the Efficacy of Using Learning Maps as an Organizing Structure for Formative Assessment: Some Lessons Learned, *Neal M. Kingston, Jessica Hess, Dale Cope, and Russell Swinburne Romine*. A Balanced Approach to Using Assessment Information to Improve Teaching and Learning, *Charles A. DePascale*. Not All That Counts Is Safe for Counting: Barriers to Collecting Learning Data for Assessment Purposes, *Jacqueline P. Leighton*. Leveraging Ideas From Adaptive Testing to Adaptive Learning: The HERA Showcase, *Meirav Arieli-Attali, Sue J. Ward, Vanessa Simmering, Yigal Rosen, and Alina A. von Davier*. About the Contributors.



Innovative Psychometric Modeling and Methods

Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland

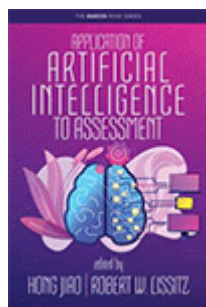
2020. Paperback 978-1-64802-222-7 \$45.99. Hardcover 978-1-64802-223-4 \$85.99. eBook 978-1-64802-224-1 \$74.

The general theme of this book is to present innovative psychometric modeling and methods. In particular, this book includes research and successful examples of modeling techniques for new data sources from digital assessments, such as eye-tracking data, hint uses, and process data from game-based assessments. In addition, innovative psychometric modeling approaches, such as graphical models, item tree models, network analysis, and cognitive diagnostic models, are included.

Chapters 1, 2, 4 and 6 are about psychometric models and methods for learning analytics. The first two chapters focus on advanced cognitive diagnostic models for tracking learning and the improvement of attribute classification accuracy. Chapter 4 demonstrates the use of network analysis for learning analytics. Chapter 6 introduces the conjunctive root causes model for the understanding of prerequisite skills in learning. Chapters 3, 5, 8, 9 are about innovative psychometric techniques to model process data. Specifically, Chapters 3 and 5 illustrate the usage of generalized linear mixed effect models and item tree models to analyze eye-tracking data. Chapter 8 discusses the modeling approach of hint uses and response accuracy in learning environment. Chapter 9 demonstrates the identification of observable outcomes in the game-based assessments. Chapters 7 and 10 introduce innovative latent variable modeling approaches, including the graphical and generalized linear model approach and the dynamic modeling approach.

In summary, the book includes theoretical, methodological, and applied research and practices that serve as the foundation for future development. These chapters provide illustrations of efforts to model and analyze multiple data sources from digital assessments. When computer-based assessments are emerging and evolving, it is important that researchers can expand and improve the methods for modeling and analyzing new data sources. This book provides a useful resource to researchers who are interested in the development of psychometric methods to solve issues in this digital assessment age.

CONTENTS: *Advances in Psychometric Methods for Uncovering Latent Structure and Cognitive Processes*, Steven Andrew Culpepper. *Improving Attribute Classification Accuracy in High Dimensional Data: A Four-Step Latent Regression Approach*, Yan Sun and Jimmy de la Torre. *A Dynamic Generalized Mixed Effect Model for Intensive Binary Temporal-Spatio Data From an Eye-Tracking Technique*, Sun-Joo Cho, Sarah Brown-Schmidt, Matthew Naveiras, and Paul De Boeck. *Application of Network Analysis in Understanding Collaborative Problem-Solving Processes and Skills*, Mengxiao Zhu, Jessica Andrews-Todd, and Mo Zhang. *IRTtree Modeling of Cognitive Processes Based on Outcome and Intermediate Data*, Paul De Boeck and Sun-Joo Cho. *Prerequisite Structure Finding Using the Conjunctive Root Causes Model*, Xinchu Zhao, Benjamin Deonovic, and Gunter Maris. *A Graphical and Generalized Linear Model Approach to Latent Variable Modeling*, Frank Rijmen. *Modeling Hint Requests, Response Times, and Response Accuracy in Adaptive Learning Systems*, Maria Bolsinova, Benjamin Deonovic, Meirav Attali, and Gunter Maris. *Identifying Observable Outcomes in Game-Based Assessments*, Russell Almond, Valerie J. Shute, Seyfullah Tingir, and Seyedahmad Rahimi. *A Regime-Switching (RS) Framework for Formulating Multi-Phase Linear and Nonlinear Growth Curve Models*, Sy-Miin Chow, Dongjun You, and Tracy Clouthier. *About the Editors*.



Application of Artificial Intelligence to Assessment

Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland

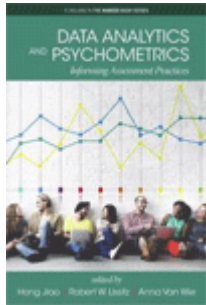
2020. Paperback 978-1-64113-951-9 \$45.99. Hardcover 978-1-64113-952-6 \$85.99. eBook 978-1-64113-953-3 \$74.

The general theme of this book is to present the applications of artificial intelligence (AI) in test development. In particular, this book includes research and successful examples of using AI technology in automated item generation, automated test assembly, automated scoring, and computerized adaptive testing. By utilizing artificial intelligence, the efficiency of item development, test form construction, test delivery, and scoring could be dramatically increased.

Chapters on automated item generation offer different perspectives related to generating a large number of items with controlled psychometric properties including the latest development of using machine learning methods. Automated scoring is illustrated for different types of assessments such as speaking and writing from both methodological aspects and practical considerations. Further, automated test assembly is elaborated for the conventional linear tests from both classical test theory and item response theory perspectives. Item pool design and assembly for the linear-on-the-fly tests elaborates more complications in practice when test security is a big concern. Finally, several chapters focus on computerized adaptive testing (CAT) at either item or module levels. CAT is further illustrated as an effective approach to increasing test-takers' engagement in testing.

In summary, the book includes both theoretical, methodological, and applied research and practices that serve as the foundation for future development. These chapters provide illustrations of efforts to automate the process of test development. While some of these automation processes have become common practices such as automated test assembly, automated scoring, and computerized adaptive testing, some others such as automated item generation calls for more research and exploration. When new AI methods are emerging and evolving, it is expected that researchers can expand and improve the methods for automating different steps in test development to enhance the automation features and practitioners can adopt quality automation procedures to improve assessment practices.

CONTENTS: Augmented Intelligence and the Future of Item Development, *Mark J. Gierl, Hollis Lai, and Donna Matovinovic*. Reconceptualizing Items: From Clones and Automatic Item Generation to Task Model Families, *Richard Luecht and Matthew Burke*. Artificial Intelligence for Scoring Oral Reading Fluency, *Jared Bernstein, Jian Cheng, Jennifer Balogh, and Ryan Downey*. Natural Language Processing and the Literacy Challenge, *Jill Burstein*. Practical Considerations for Using AI models in Automated Scoring of Writing, *Peter W. Foltz*. Item Pool Design and Assembly: The State of the Art, *Jeffrey M. Patton and Ray Y. Yan*. Automated Test Assembly: Case Studies in Classical Test Theory and Item Response Theory, *Siang Chee Chuah, Donovan Hare, Luz Bay, and Thomas Proctor*. Multistage Testing in Practice, *Duanli Yan*. An Intelligent CAT That Can Deal With Disengaged Test Taking, *Steven L. Wise*. Differences in the Amount of Adaptation Exhibited by Various Computerized Adaptive Testing Designs, *Mark D. Reckase, Unhee Ju, and Sewon Kim*. Automatic Item Generation With Machine Learning Techniques: A Pathway to Intelligent Assessments, *Jaehwa Choi*. About the Editors.



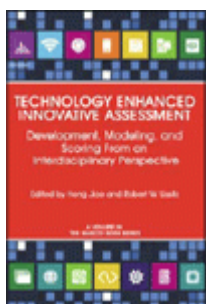
Data Analytics and Psychometrics Informing Assessment Practices

Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland; Anna Van Wie, University of Maryland

2018. Paperback 978-1-64113-326-5 \$45.99. Hardcover 978-1-64113-327-2 \$85.99. eBook 978-1-64113-328-9 \$74.

The general theme of this book is to encourage the use of relevant methodology in data mining which is or could be applied to the interplay of education, statistics and computer science to solve psychometric issues and challenges in the new generation of assessments. In addition to item response data, other data collected in the process of assessment and learning will be utilized to help solve psychometric challenges and facilitate learning and other educational applications. Process data include those collected or available for collection during the process of assessment and instructional phase such as responding sequence data, log files, the use of help features, the content of web searches, etc. Some book chapters present the general exploration of process data in large-scale assessment. Further, other chapters also address how to integrate psychometrics and learning analytics in assessment and survey, how to use data mining techniques for security and cheating detection, how to use more assessment results to facilitate student's learning and guide teacher's instructional efforts. The book includes both theoretical and methodological presentations that might guide the future in this area, as well as illustrations of efforts to implement big data analytics that might be instructive to those in the field of learning and psychometrics. The context of the effort is diverse, including K-12, higher education, financial planning, and survey utilization. It is hoped that readers can learn from different disciplines, especially those who are specialized in assessment, would be critical to expand the ideas of what we can do with data analytics for informing assessment practices.

CONTENTS: On Integrating Psychometrics and Learning Analytics in Complex Assessments, *Robert J. Mislevy*. Exploring Process Data in Problem-Solving Items in Computer-Based Large-Scale Assessments: Case Studies in PISA and PIAAC, *Qiwei He, Matthias von Davier, and Zhuangzhuang Han*. The Use of Data Mining Techniques to Detect Cheating, *Sarah L. Thomas and Dennis D. Maynes*. Selected Applications of Data Science in Cyber Security, *Yue (Richard) Xie*. Assessing Learner-Driven Constructs in Informal Learning Environments: Synergies Created by the Nexus of Psychometrics, Learning Analytics, and Educational Data Mining, *Lori C. Bland*. Measuring Rater Effectiveness: New Uses of Value-Added Modeling in Competency-Based Education, *B. Brian Kuhlman*. Ranking Documents in Online Enterprise Social Network, *Alex H. Wang and Umeshwar Dayal*. Methods for Measuring Learning Evaluation in the Context of E-Learning, *Matthew Pietrowski, Roopa Sanwardeker, and David Witkowski*. High Level Strategic Approaches for Conducting Big Data Studies in Assessment, *Manfred M. Straehle, Liberty J. Munson, Austin Fossey, and Emily Kim*. Integrating Survey and Learning Analytics Data for a Better Understanding of Engagement in MOOCs, *Evgenia Samoilova, Florian Keusch, and Frauke Kreuter*.



Technology Enhanced Innovative Assessment Development, Modeling, and Scoring From an Interdisciplinary Perspective

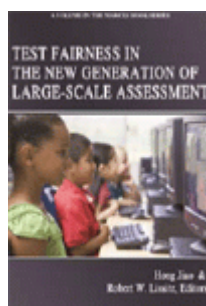
Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland

2017. Paperback 9781681239293 \$45.99. Hardcover 9781681239309 \$85.99. eBook 9781681239316 \$74.

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.

CONTENTS: The Virtual World and Reality of Testing: Building Virtual Assessments, *Christopher Agard and Alina von Davier*. Consistency and Validity in Game-Based Stealth Assessment, *Valerie J. Shute and Gregory R. Moore*. Designing, Implementing, and Researching the Effects of Narrative-Based Assessment in Virtual Environments, *Diane Jass Ketelhut and Brian C. Nelson*. SimScientists: Affordances of Science Simulations for Formative and Summative Assessment, *Edys S. Quellmalz and Matt D. Silbertglitt*. Exploring the Psychometric Properties of Innovative Items in Computerized Adaptive Testing, *Hong Qian, Ada Woo, and Doyoung Kim*. A New Noncompensatory Testlet Model for Calibrating Innovative Items Embedded in Multiple Contexts, *Hong Jiao, Robert Lissitz, and Peida Zhan*. Validity Issues for Technology-Enhanced Innovative Assessments, *Brian Clauser, Melissa J. Margolis, and Jerome C. Clauser*. Principled Design and Development for Embedding Assessment for Learning in Games and Simulations, *Kristen DiCerbo, Steve Ferrara, and Emily Lai*. Innovations in K-12 Assessment: A Review of CBAL Research, *Randy Elliot Bennett, Rebecca Zwick, and Peter van Rijn*. ICT Literacy as a 21st Century Skill: Learning in Digital Networks, *Mark Wilson, Kathleen Scalise, and Perman Gochyyev*. Visualizing the Process of Change in Learner Beliefs, *Valerie J. Shute, Allen C. Jeong, and Diego Zapata-Rivera*. About the Authors.



Test Fairness in the New Generation of Large-Scale Assessment

Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland

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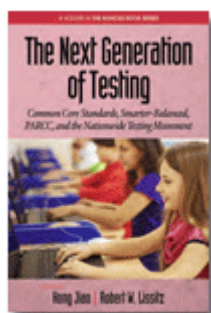
The new generation of tests is faced with new challenges. In the K-12 setting, the new learning targets are intended to assess higher-order thinking skills and prepare students to be ready for college and career and to keep American students competitive with their international peers. In addition, the new generation of state tests requires the use of technology in item delivery and embedding assessment in real-world, authentic, situations. It further requires accurate assessment of students at all ability levels. One of the most important questions is how to maintain test fairness in the new assessments with technology innovative items and technology delivered tests. In the traditional testing programs such as licensure and certification tests and college admission tests, test fairness has constantly been a key psychometric issue in test development and this continues to be the case with the national testing programs.

As test fairness needs to be addressed throughout the whole process of test development, experts from state, admission, and licensure tests will address test fairness challenges in the new generation assessment. The book chapters clarify misconceptions of test fairness including the use of admission test results in cohort comparison, the use of international assessment results in trend evaluation, whether standardization and fairness necessarily mean uniformity when test-takers have different cultural backgrounds, and whether standardization can insure fairness. More technically, chapters also address issues related to how compromised items and test fairness are related to classification decisions, how accessibility in item development and accommodation could be mingled with technology, how to assess special populations with dyslexia, using Blinder-Oaxaca Decomposition for differential item functioning detection, and differential feature functioning in automated scoring.

Overall, this book addresses test fairness issues in state assessment, college admission testing, international assessment, and licensure tests. Fairness is discussed in the context of culture and special populations. Further, fairness related to

performance assessment and automated scoring is a focus as well. This book provides a very good source of information related to test fairness issues in test development in the new generation of assessment where technology is highly involved.

CONTENTS: Resolving the Paradox of Rich Performance Tasks, *Robert Mislevy*. The Effect of Item Preknowledge On Classification Accuracy, *Patrick Obregon and Ray Yan*. Considerations in Making Next Generation Assessments Accessible and Fair, *Linda Zimmerman and Paul C. Grudnitski*. Redesigning the SAT Using Principles of Fairness and Equity, *Sherral Miller, Michael Walker, and Lynn Letukas*. Analyzing the Invariance of Item Parameters Used to Estimate Trends in International Large-Scale Assessments, *Maria Elena Oliveri and Matthias von Davier*. Culture in Fair Assessment Practices, *Edynn Sato*. Using Blinder-Oaxaca Decomposition to Explore Differential Item Functioning: Application to PISA 2009 Reading, *Daniel Bolt, Maritza Dowling, Yu-Shan Shih, and Wei-Yin Loh*. Differential Feature Functioning in Automated Essay Scoring, *Mo Zhang, Neil Dorans, Chen Li, and Andre Rupp*. Defining and Challenging Fairness in Tests Involving Students With Dyslexia: Key Opportunities in Test Design and Score Interpretations, *M. Christina Schneider, Karla Egan, and Brian Gong*. About the Authors.



The Next Generation of Testing Common Core Standards, Smarter-Balanced, PARCC, and the Nationwide Testing Movement

Hong Jiao, University of Maryland; Robert W. Lissitz, University of Maryland

2015. Paperback 9781681233079 \$45.99. Hardcover 9781681233086 \$85.99. eBook 9781681233093 \$74.

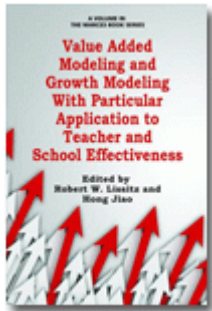
The Race To The Top (RTTP) federal education policy fostered a new generation of state tests. This policy advocated adopting common core standards which set a higher level of learning targets for students in the US K-12 education. These standards are intended to assess higher order thinking skills and prepare students ready for college and career. In the meantime, they are aligned with those for international assessments which keep US students abreast of their international peers. Furthermore, the new generation of state tests requires the use of technology enhanced items to align student assessments with student learning environment. Computer technology is indispensable to accomplish this goal. Computer based tests related to common core standards are different from previous state computer based tests in two important aspects, one is that the current version requires accurate assessment of students along all ability levels and the other is that it promotes the use of an efficient test delivery system, essentially the use of computerized adaptive assessment in K-12 state testing programs. In addition to providing summative information about student learning, the new common core tests add formative assessment component in the whole assessment system to provide timely feedback to students and teachers during the process of student learning and teacher instruction. As with its predecessor, the new assessment policy also holds teachers and schools accountable for student learning.

With the requirements by the new federal education policy, states formed two consortia: Partnership for Assessment of Readiness for College and Careers (PARCC) and Smarter-Balanced Assessment Consortium (SBAC) to develop assessments in alignment with the new common core standards. This book is based on the presentations made at the Thirteenth Annual Maryland Assessment Research Center's Conference on "The Next Generation of Testing: Common Core Standards, Smarter-Balanced, PARCC, and the Nationwide Testing Movement". Experts from the consortia and nationwide overviewed the intention, history and the current status of this nationwide testing movement. Item development, test design, and transition from old state tests to the new consortia tests are discussed. Test scoring and reporting are specially highlighted in the book. The challenges related to standard setting for the new test, especially in the CAT environment and linking performance standards from state tests with consortium tests were explored. The issues of utilizing the consortium test results to evaluate students' college and career readiness is another topic addressed in the book. The last chapters address the critical issue of validity in the new generation of state testing programs.

Overall, this book presents the latest status of the development of the two consortium assessment systems. It addresses the most challenging issues related to the next generation of state testing programs including development of innovative items assessing higher order thinking skills, scoring of such items, standard setting and linkage with the old state specific standards, and validity issues. This edited book provides a very good source of information related to the consortium tests based on the common core standards.

CONTENTS: 1. How we got to where we are: evolving policy demands for the next generation assessments, *Laurens L. Wise, HumRRO*. 2. Overview, intention, history and where we are now, *Martha McCall, Smarter-Balanced Assessment Consortium*. 3. PARCC as a case study in understanding the design of large-scale assessment in the era of common core state standards, *Bonnie A. Hain and Carrie Piper, PARCC Inc*. 4. Principled Design for Efficacy: Design and Development

for the Next Generation of Assessments, *Paul D. Nichols, Steve Ferrara, and Emily Lai, Pearson*. 5. The Role of Machine Scoring in Summative and Formative Assessment, *Mark D. Shermis, University of Houston-Clear Lake*. 6. Methods for Monitoring and Document Rating Quality, *Edward W. Wolfe and Tian Song, Pearson*. 7. State of the Art Standard Setting for State of the Art Assessments, *Luz Bay, The College Board*. 8. Standard Setting on Planet NextGen, *Gary Skaggs, Virginia Tech*. 9. A Profile Approach to Determining College and Career Readiness, *David T. Conley, University of Oregon*. 10. Outline of Smarter Balanced Validity Agenda, *Martha McCall, Smarter Balanced Assessment Consortium*. 11. A Theory of Action for Test Validation, *Steve Sireci, University of Massachusetts, Amherst*. 12. Empirical and Procedural Validity Evidence in Development and Implementation of PARCC Assessments, *Enis Dogan, Jeffrey B. Hauger, and Casey Maliszewski, PARCC, Inc.*



Value Added Modeling and Growth Modeling with Particular Application to Teacher and School Effectiveness

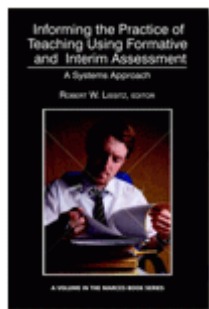
Robert W. Lissitz, University of Maryland; Hong Jiao, University of Maryland

2014. Paperback 9781623967741 \$45.99. Hardcover 9781623967758 \$85.99. eBook 9781623967765 \$74.

Modeling student growth has been a federal policy requirement under No Child Left Behind (NCLB). In addition to tracking student growth, the latest Race To The Top (RTTP) federal education policy stipulates the evaluation of teacher effectiveness from the perspective of added value that teachers contribute to student learning and growth. Student growth modeling and teacher value-added modeling are complex. The complexity stems, in part, from issues due to non-random assignment of students into classes and schools, measurement error in students' achievement scores that are utilized to evaluate the added value of teachers, multidimensionality of the measured construct across multiple grades, and the inclusion of covariates. National experts at the Twelfth Annual Maryland Assessment Research Center's Conference on "Value Added Modeling and Growth Modeling with Particular Application to Teacher and School Effectiveness" present the latest developments and methods to tackle these issues. This book includes chapters based on these conference presentations. Further, the book provides some answers to questions such as what makes a good growth model? What criteria should be used in evaluating growth models? How should outputs from growth models be utilized? How auxiliary teacher information could be utilized to improve value added? How multiple sources of student information could be accumulated to estimate teacher effectiveness? Whether student-level and school-level covariates should be included? And what are the impacts of the potential heterogeneity of teacher effects across students of different aptitudes or other differing characteristics on growth modeling and teacher evaluation?

Overall, this book addresses reliability and validity issues in growth modeling and value added modeling and presents the latest development in this area. In addition, some persistent issues have been approached from a new perspective. This edited volume provides a very good source of information related to the current explorations in student growth and teacher effectiveness evaluation.

CONTENTS: Preface, *J. R. Lockwood and Daniel F. McCaffrey*. Should Nonlinear Functions of Test Scores Be Used as Covariates in a Regression Model? *J. R. Lockwood and Daniel F. McCaffrey*. Value-Added to What? The Paradox of Multidimensionality, *Derek C. Briggs and Ben Domingue*. Accuracy, Transparency, and Incentives: Contrasting Criteria for Evaluating Growth Models, *Andrew Ho*. A Research-Based Response to Federal Non-Regulatory Guidance on Growth Models, *Mark Ehlert, Cory Koedel, Eric Parsons, and Michael Podgursky*. Borrowing the Strength of Unidimensional Scaling to Produce Multidimensional Educational Effectiveness Profiles, *Joseph A. Martineau, and Ji Zeng*. Value-Added Models and the Next Generation of Assessments, *Robert H. Meyer and Emin Dokumaci*. Using Auxiliary Teacher Data to Improve Value-Added: An Application of Small Area Estimation to Middle School Mathematics Teachers, *Daniel F. McCaffrey, Bing Han, and J. R. Lockwood*. The Evaluation of Teachers and Schools Using the Educator Response Function (ERF), *Mark D. Reckase and Joseph A. Martineau*. The Effective Use of Student and School Descriptive Indicators of Learning Progress: From the Conditional Growth Index to the Learning Productivity Measurement System, *Y. M. Thum*. Educational Value-Added Analysis of Covariance Models with Error in the Covariates, *S. Paul Wright*. Direct Modeling of Student Growth With Multilevel and Mixture Extensions, *Hong Jiao and Robert Lissitz*. Modeling Latent Growth Using Mixture Item Response Theory, *Hong Jiao and Robert Lissitz*. About the Authors.



Informing the Practice of Teaching Using Formative and Interim Assessment A Systems Approach

Robert W. Lissitz, University of Maryland

2013. Paperback 9781623961114 \$45.99. Hardcover 9781623961121 \$85.99. eBook 9781623961138 \$74.

This book focuses on interim and formative assessments as distinguished from the more usual interest in summative assessment. I was particularly interested in seeing what the experts have to say about a full system of assessment. This book has particular interest in what information a teacher, a school or even a state could collect that monitors the progress of a student as he or she learns. The authors were asked to think about assessing the effects of teaching and learning throughout the student's participation in the curriculum.

This book is the product of a conference by the Maryland Assessment Research Center for Education Success (MARCES) with funding from the Maryland State Department of Education.

CONTENTS: An Introduction, *Robert W. Lissitz*. Connecting the Dots: Formative, Interim, and Summative Assessment, *Dylan William, Gage Kingsbury, and Steven Wise*. Design of Interim Assessment for Instructional Purpose: A Case Study Using Evidence Centered Design in Advanced Placement, *Lori Nebelsick-Gullett, Cindy Hamen Farrar, Kristen Huff, and Sheryl Packman*. Integrating Student Standardized and Formative Assessments With the National Board for Professional Teaching Standards' Teacher Development Process, *Joan Chikos Auchter*. Using Assessment Information in Real Time: What Teachers Need to Know and Be Able To Do, *Margaret Heritage*. The Instructional Influence of Interim Assessments: Voices From the Field, *Lisa M. Abrams and James H. McMillan*. Sourcing Instructionally Embedded Formative Assessments, *William D. Schafer*. Marrying Periodic and Summative Assessments: I Do, *Kimberly O'Malley, Emily Lai, Katie McClarty, and Denny Way Pearson*. Comprehensive Assessment Systems in Service of Learning: Getting the Balance Right, *Susan M. Brookhart*. Errors in Student Learning and Assessment: The Learning Errors and Formative Feedback (LEAFF) Model, *Jacqueline Leighton, Man-Wai Chu, and Paolina Seitz*. Toward a Technical Theory for Systems for Learning: The Role of Information, *Paul Nichols and Charles DePascale*. Productive Formative Assessment ALWAYS Requires Local District Preparation, *Rick Stiggins*. About the Contributors.



Computers and Their Impact on State Assessments Recent History and Predictions for the Future

Robert W. Lissitz, University of Maryland; Hong Jiao, University of Maryland

2012. Paperback 978-1-61735-725-1 \$45.99. Hardcover 978-1-61735-726-8 \$85.99. eBook 978-1-61735-727-5 \$74.

The Race To The Top program strongly advocates the use of computer technology in assessments. It dramatically promotes computer-based testing, linear or adaptive, in K-12 state assessment programs. Moreover, assessment requirements driven by this federal initiative exponentially increase the complexity in assessment design and test development. This book provides readers with a review of the history and basics of computer-based tests. It also offers a macro perspective for designing such assessment systems in the K-12 setting as well as a micro perspective on new challenges such as innovative items, scoring of such items, cognitive diagnosis, and vertical scaling for growth modeling and value added approaches to assessment. The editors' goal is to provide readers with necessary information to create a smarter computer-based testing system by following the advice and experience of experts from education as well as other industries.

This book is based on a conference (<http://marces.org/workshop.htm>) held by the Maryland Assessment Research Center for Education Success. It presents multiple perspectives including test vendors and state departments of education, in designing and implementing a computer-based test in the K-12 setting. The design and implementation of such a system requires deliberate planning and thorough considerations. The advice and experiences presented in this book serve as a guide to practitioners and as a good source of information for quality control.

The technical issues discussed in this book are relatively new and unique to K-12 large-scale computer-based testing programs, especially due to the recent federal policy. Several chapters provide possible solutions to psychometricians

dealing with the technical challenges related to innovative items, cognitive diagnosis, and growth modeling in computer-based linear or adaptive tests in the K-12 setting.

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