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Valid Assessments

VALERIE J. SHUTE

Educational Testing Service, Rosedale Road, MS 13E, Princeton, NJ 08541 USA

Preface

The following collection of papers examines systematic methods for the design and development of assessments that support learning. The challenge, as we know from intelligent tutoring system modeling research of the past, depends largely on correctly identifying aspects of learner proficiencies, such as inferred mastery, as well as presence of procedural bugs, misconceptions, or erroneous facts. Effective instruction capitalizes on this information when selecting and serving up subsequent content.

One assessment design framework that receives substantial focus in this special issue is called evidence-centered design or ECD (e.g., Mislevy, Steinberg & Almond, in press). Basically, this involves: (1) defining the proficiencies and claims to be made about the students (i.e., the knowledge, skills, and abilities to be instructed and assessed), (2) delineating relevant evidences per claim (i.e., student performance data demonstrating varying levels of mastery), and (3) determining the features and parameters of tasks that will elicit and generate that evidence. Evidence, at the heart of this approach, ties the diagnostic tasks directly back to the underlying claims and proficiencies, creating an evidentiary chain in the process.[1]

The multi-disciplinary collection of papers herein comes from researchers concerned with designing, developing, and/or evaluating valid, diagnostic assessments. The research spans the gamut from basic to applied. Moreover, the domains are quite varied, from assessing computer-networking skills

*Corresponding author: vshute@ets.org

[1]This approach is consistent with a long history of research by Scandura and his associates on the role of assessment in structural learning theory (SLT) (See Scandura, 2001 for an excellent review of SLT developments across its three-decade evolution).

(Bauer & Williamson) to elementary reading proficiency (Beck, Jia, & Mostow; and Mostow, Beck, Bey, Cuneo, Sison, Tobin, & Valeri). Shute presents a general overview of the ECD approach and describes a way to automate the acquisition of information needed to populate ECD's proficiency and evidence models. Guzmán & Conejo describe a library of template structures, embodied in their SIETTE system, that allows for automated construction of varied assessment items. Underwood discusses an extension to ECD that helps teachers, particularly less experienced ones, better understand and use student performance data. Finally, Graf, Bassok, Hunt, and Minstrell present the results from a set of experimental studies that sought to evaluate the effectiveness of different kinds of instructional interventions based on specific diagnostic assessments in their DIAGNOSER system.

Consequently, this special issue is relevant to a wide range of practitioners and research scientists, including those involved with instructional design, test development, psychometrics, e-learning systems design, task modeling, authoring shells, and student modeling. Again, the common thread of interest across these papers is the *enhancement of student learning via sound diagnostic assessments*, using evidence as the basis on which to make important decisions.

The foundation for these papers was a workshop that was part of the ITS 2002 conference in France on Diagnostic Assessments.

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