

Chapter 4

Assessing Engagement During the Online Assessment of Real–World Skills

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ABSTRACT

The assessment of real-world skills will often require complex and innovative types of computer-based test items to provide more authentic assessment. Having information about how students remain engaged with the various innovative elements during an assessment is useful in both assessing the utility of different types of innovative test items and assessing the validity of the inferences made about the test scores of individual students. This chapter introduces the Item Engagement Index (IEI) and the Student Engagement Index (SEI) and demonstrates their use with a variety of innovative items that were pilot tested for a nursing licensure exam. The IEI provided useful information about the amount of student effort each innovative item received, while the SEI was found useful in identifying disengaged test takers.

INTRODUCTION

There is a growing interest in skills such as critical thinking, collaborative problem solving, creativity, and global competency in technology-rich environments (often referred to as 21st century skills or real-world skills; e.g., Partnership for 21st Century Learning, 2011). Educators are increasingly expected to help their students develop these real-world skills, and both the formative and summative assessments of such skills should capitalize on the affordances offered by emerging technology (Davies & West, 2014; United States Department of Education, 2014). This *Handbook* represents a compendium of research about computer-based learning and assessment of these types of skills.

When assessing real-world skills, a key challenge can be the match between what is required to perform the target skill in the workplace and the way this skill is assessed. The call for *authentic assessment* has

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centered on this need. While authentic instruction involves students engaging in activities that involve applying knowledge and skills and have meaning in the world beyond the classroom (King, Newmann, & Carmichael, 2009; Newmann, Marks, & Gamoran, 1996), in the assessment context, preparation for an authentic assessment involves actually practicing the target skill (Wiggins, 1990). With traditional text-based multiple-choice items, the construct match for career, or real-world, skills can be quite low, and thus less authentic. Innovative items offer opportunities to expand an assessment's domain coverage either by assessing particular skills and processes that could not be tested with text-based multiple-choice items, or by improving the ways in which skills and concepts are assessed (Parshall, Harmes, Davey, & Pashley, 2010). Both expanded domain coverage, and improved measurement tools can serve to increase the authenticity of a particular assessment. While innovative items can provide the opportunity for better measurement, it is important to analyze how students are interacting with various types of item innovations, and to devise measurement tools and procedures to gauge the quality and behavior of these new types of items in practice. Similarly, it is critical to gauge the degree to which students are engaged when responding to test items.

This chapter describes a procedure for assessing the degree to which students are engaged with different types of innovative items, and illustrates the use of this procedure with data collected on a set of innovative items designed to target entry-level nursing skills (Wendt & Harmes, 2009). Throughout the chapter, two basic assumptions are made about the typical assessment of real-world skills. First, these types of assessments will be computer-based (i.e., delivered via a desktop or laptop computer or another type of digital device). Second, they will often use innovative items instead of (or at least in conjunction with) traditional text-based multiple-choice items.

INNOVATIVE ITEMS

One of the most exciting and promising aspects of the use of technology in assessment is the set of expanded possibilities afforded by innovative item formats. In general, innovative items are technology-based test items or tasks that include functionality and features that extend beyond traditional text-based multiple-choice items. These innovative items have also been referred to as “technology-enhanced items” (Zenisky & Sireci, 2013). Helpful discussions of the range of item types and functionalities that can be used in the assessment of real-world skills can be found in Parshall, Harmes, Davey, and Pashley (2010), Scalise (2012), Scalise and Gifford (2006), and Sireci and Zenisky (2006).

The general taxonomy provided by Parshall et al. includes seven dimensions for classifying innovative items: assessment structure, response action, media inclusion, interactivity, complexity, fidelity, and scoring method (2010). Assessment structure describes the continuum from a discrete item, such as an individual selected-response item, to a complete simulated environment. Response action refers to the actions required on the part of the student to record a response. This range could include using a mouse or track pad to select elements, directly interacting with the screen, or operating specialized real-world devices. Media inclusion covers various ways of incorporating multimedia elements such as graphics, audio, or video. Interactivity describes the degree to which the items or tasks respond to input from the student. Complexity refers to the range of components that the student needs to work with in order to complete the item or task. Fidelity is the degree to which an assessment accurately reproduces the context and interactions required for the task in its real-world setting. Scoring method covers how student responses are translated into scores on the item or task and then for the overall test. While each of these

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