

Capturing Expert Item Writers' Item Writing Expertise

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With the increase in interest and use of innovative item types on large-scale assessments, test developers are experiencing pressure to efficiently and cost effectively produce quality innovative items. The efficient development of quality innovative items may be hindered by inexperienced item writers who are not familiar with the challenges and nuances of innovative item types. The study of expert item writers offers the possibility of capturing and “bottling” the knowledge and skills acquired by these experts over years of hard work. Careful examination of expert item writers' cognitive processes may facilitate efforts to improve the quality of items at an early phase of development by addressing and resolving areas of need in novice item writers' knowledge and skills related to item construction. Information gleaned from expert item writers may be incorporated into item writing workshops in order to help equip new item writers with the tools necessary to produce quality items.

In a study of experienced item writers' cognition when writing

figural response items, Fulkerson, Mittelholtz, and Nichols (2009) used verbal reports and protocol analysis techniques (Ericsson & Simon, 1993) to identify the cognitive processes of expert item writers. This study found that expert item writers engaged in three phases of problem solving: representation, exploration, and solution.

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In the initial representation phase, expert item writers routinely created a mental model of the situation described in the item writing assignment. This representation was done by quickly and accurately defining the problem. Problem definition occurs following the receipt and initial reading of the item writing assignments and reveals the item writers' efforts to represent the assignment in terms and concepts with which they are familiar. In the second phase, the exploration phase, the item writers mentally and physically explored the problem space in search of content that represents a possible solution to the

assignment. In the third phase, the solution phase, the item writers successfully completed the assignment by finding a workable solution that satisfies the predefined constraints. During these three phases, expert item writers encountered few impasses and were able to quickly recognize and work around constraints. Frequently, the writers relied on past experiences and previously acquired specific knowledge to move forward toward a satisfactory solution to the item writing assignment.

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In an extension of the initial study, Fulkerson, Nichols, and Mittelholtz (2010) analyzed the cognitive processes of item writers who possessed varying degrees of innovative item writing experience. In this study, three writers were each asked to write one four-scene storyboard and one related multiple-choice item. In innovative item development, a storyboard is a precursor to a scenario that serves as the context for a set of related

items. Two of the three writers had some experience in scenario-based innovative item development, while the third writer had no experience in this specific area. Using verbal reports and protocol analysis techniques, the item writers' cognitive processes were captured and analyzed.

The results of this study indicate that the experienced writers moved forward in completing the item writing assignment more efficiently than the writer with no experience in scenario-based tasks.

Furthermore, the experienced writers' thinking revealed frequent combinations of problem definition, exploration, evaluation, and solution activities as they moved through the problem space toward the completion of the item writing assignment. In contrast, the inexperienced item writer showed an erratic pattern of thought processes and frequently stalled or moved backward in the problem space.

These studies, which were part of a National Science Foundation-funded research project on the application of evidence-centered design in large-scale assessment, move toward the development of a cognitive model of item writing expertise. This proposed model predicts that a pattern of mental activities will occur throughout the

item writing process. In general, problem definition processes should occur at the beginning of an item writing phase or activity. The middle of the item writing activity should be dominated by mental and physical exploration. The conclusion of the item writing activity should be dominated by evaluation and solution satisfaction processes. This pattern may be repeated throughout the activity until the task is complete.

The results of these studies suggest that inexperienced item writers need to be supported in several ways. Firstly, inexperienced item writers may have difficulty accommodating the cognitive load of an item writing assignment. Item writing workshops should explore ways to decrease the cognitive load of the item writing task. Perhaps assignments for novice writers could be decomposed and presented in smaller portions. Secondly, inexperienced item writers have difficulty organizing their response to an assigned task. Item writing workshops could offer new item writers templates, design patterns, and other supports that purposefully structure their item writing process. Finally, inexperienced item writers have a greater demand for easily accessible task-specific information. Item writing workshops should attempt to support new item writers by making information

relevant to their assignment readily available, perhaps using pull down menus, searchable databases, or other technology-enhanced tools.

References

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