

TIER Computations Progress
Monitoring System: Expert Review

RESEARCH IN
MATHEMATICS
EDUCATION

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Abstract

The purpose of the current report is to describe the external review process of item models for the Tiered Intervention with Evidenced-Based Research (TIER) Computations Progress Monitoring System. We recruited five external reviewers to critically analyze 220 item models that were developed by Texas teachers and assessment researchers. The results of these reviews

- a deep understanding of the Texas Essential Knowledge and Skills;
- experience with writing mathematics assessment items in grades K-6; and
- extensive background in supporting elementary or middle school teachers as a mathematics coach, preferred.

Overall, we enlisted five expert reviewers to review the item models. Their bios are provided below. In the subsequent sections, we describe the external review process and results of the external review.

Reviewer 1 (Grade K) is an associate professor in school psychology at the University of Oregon. His research interest center on mathematical development, which includes assessment, instruction, and school systems that support mathematical development. Reviewer 1 has served or is currently serving as the principal investigator on twenty federally funded grants in mathematics instruction. He has also published articles and book chapters on mathematics instruction and assessment and developing multi-tiered instructional models. Prior to academia, Reviewer 1 was a practicing school psychologist.

Reviewer 2 (Grade 1) is an assistant professor and associate chair in the Department of Child and Adolescent Development at San Francisco State University. Her primary interest center on child development, early childhood education, early math and literacy development, professional development and teacher education, and the formation and implementation of early childhood public policy. Reviewer 2 has 14 years of experience working directly with children and families as a teacher and director of an early childhood program. She currently serves or has served in a consultant role for multiple organizations, including RTI International, UNESCO, and RUTU Foundation.

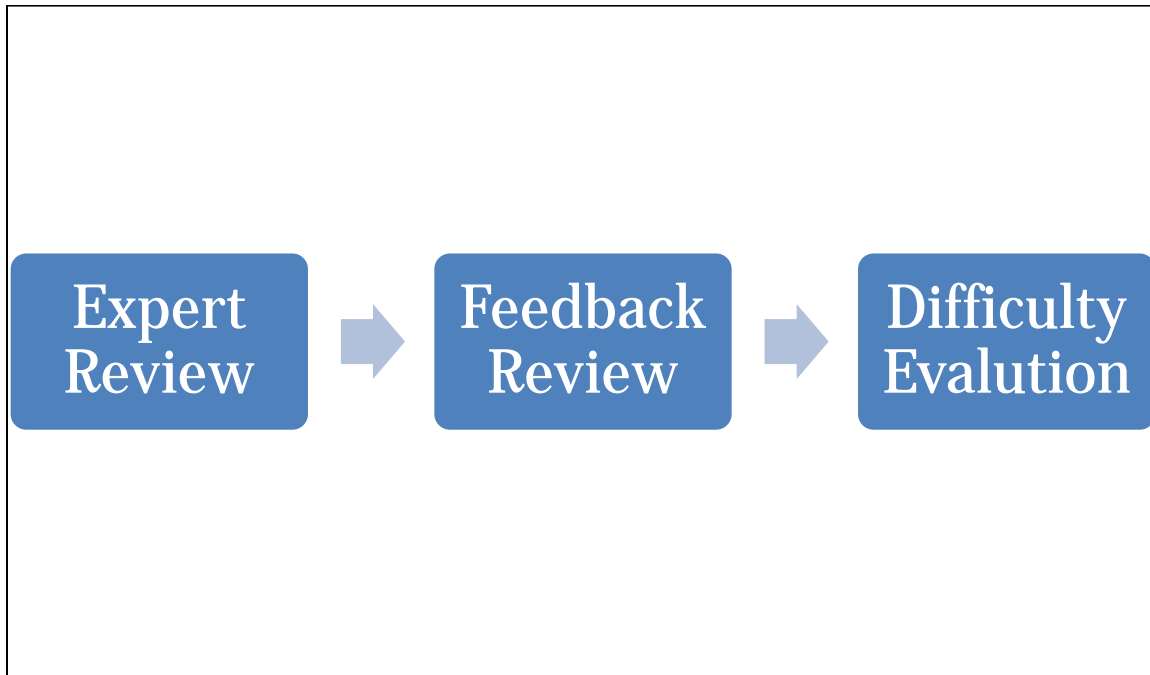
Reviewer 3 (Grades 2 & 3) is an assistant professor of special education at the University of Illinois, Urbana-Champaign. Her research interests include the teaching of mathematics to students experiencing difficulty, including students identified with disability labels. Currently, Reviewer 3 serves as the principal investigator for a project focused on pre-service teachers' views of disability and special education. She also received the Outstanding Dissertation Award from the American Education Research Association. Reviewer 3 actively publishes in special education and evaluation journals.

Reviewer 4 (Grades 4 & 5) is a postdoctoral researcher at Boise State University. She currently works on the National Science Foundation study titled "Research Order in Teaching (ROOT)".
Reviewer 4

decision-making with a focus on integrated research-based instructional design and delivery

Figure 1

Review and Reconciliation Process



Feedback Review

Figure 2 highlights the feedback received from the reviewer in grade 4. If expert reviewers indicated a rating of disagree or strongly disagree, we asked the reviewer to provide feedback and/or recommendations for changes. Table 1 describes the percent agreement of the expert review across grades within the domains previously listed. The percent agreement of item models that aligned to the TEKS ranged from 77% to 100%. Alignment to the assigned difficulty agreement ranged from 57% to 95%. Agreement that the item constraints would yield 20 comparable items ranged from 77% to 100%. Agreement of the appropriateness of the misconceptions ranged from 44% to 100% and agreement in the appropriateness of the alternate responses ranged from 50% to 100%. The weakest domain across grades was the alternate responses with the highest domain being the misconceptions.

Figure 2

Sample Grade 4 Expert Review Feedback

Table 1

Expert Review Percent Agree/Strong Agree

Domain	K*	1*
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Figure 3

Reviewer Feedback of 5(3)(B)_02

Figure 4 provides the response from the reconciliation team to TEKS 5(3)(B). An RME team

Figure 5

Difficulty Determination for 5(3)(B)

TEA Review

TEA reviewed the combined item models within a template of a form for each of the seven grades (all items together within a grade) and provided a few comments on the item models after the RME team completed the reconciliation of the expert reviewers' feedback. Some comments pertained to the structure of the items themselves. For example, some graphics that were created for kindergarten needed adjustments to improve clarity of the item. Another comment for kindergarten centered on the prompt of the quantity discrimination section. For grade four, TEA made a comment about the lack of space for students to perform calculations.

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- Haider, M.Q., Sparks, A., McMurrer, J., & Ketterlin-Geller, L. (2021). *TIER computations progress monitoring system: Item modeling* (Tech. Rep. No. 21-02)