Shortened Indiana Math Beliefs Scales
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Last updated 11.5.25

Shortened Indiana Math Beliefs Scales (S-IMBS)

This measure provides insight into students' self-reported beliefs related to mathematical problem solving.

Purpose

- The shortened version of the Indiana Mathematics Beliefs Scales (S-IMBS) provides a condensed yet validated approach to measuring students' beliefs about mathematics and about themselves as mathematics learners.
- The construct of Mathematical Problem Solving Beliefs is operationalized in this measure via three subscales:
    - Difficult Problems: beliefs about one's ability to solve challenging, time-consuming problems;
    - Math Utility Value: beliefs about the usefulness of mathematics in everyday life;
    - Effort: beliefs that putting in effort can increase one's mathematical ability

Measure Details

- The final version of the S-IMBS has 11 items across three subscales:
    - Difficult Problems: 5 items
    - Math Utility Value: 3 items
    - Effort: 3 items
- All items are measured on a 0 - 100 scale, with 0 representing "never true of me" and 100 representing "always true of me"
- The corresponding Beliefs Scales from the original IMBS (Belief Scales 1, 5, and 6) contained 18 items, evenly distributed across the subscales. The original IMBS used a 5-point Likert scale for each item, ranging from "strongly disagree" to "strongly agree."

Contribution to the Field

- This measure was developed in response to school district partners' requests to minimize the amount of time needed for data collection within efficacy studies; these requests were due in part to limited instructional time during the COVID pandemic.
- The request from district partners is in alignment with recommendations from the field to reduce survey length while gathering necessary data, in order to minimize survey fatigue experienced by participants and improve data fidelity (e.g. Fass-Holmes, 2022).

Development History and Previous Uses

- The original scale was designed for use with secondary and college students. This shortened version has been validated with demographically diverse samples of middle grades students. The S-IMBS has also been used in several small-scale efficacy studies for a mathematics problem-solving learning platform, CueThinkEF+.

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Accessing the Measure

- You may access the shortened measure (S-IMBS) here:
    - Rhodes, S., Gutierrez de Blume, A., Bryck, R., & Frimpong, P. (2025). Validation of a shortened measure of students' beliefs about problem solving. In A. Wheeler & P. Kaur Bharaj (Eds.), *Proceedings of the 52nd Annual Meeting of the Research Council on Mathematics Learning.* (pp. 33-40). RCML.
- You may access the original IMBS here:
    - Kloosterman, P. & Stage, F.K. (1992). Measuring beliefs about mathematical problem solving. *School Science and Mathematics, 92*(3), 109-115. https://onlinelibrary.wiley.com/doi/10.1111/j.1949-8594.1992.tb12154.x
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