

Rubric for Scoring Categories of Core Executive Functions in Practice

Renninger, K.A., Benke, G., Böheim, R., Corven, J., De Dios, M.C., Hogan, M.R., Kyaw, M.H., Michels, A.G., Nakayama, M., Nunez, P.T., Werneck, H., & Yared, F. (2025).

This rubric provides a qualitative tool to measure the extent to which students took advantage of an opportunity to exhibit an executive function skill within a math moment.

Purpose

- The Rubric for Scoring Categories of Core Executive Functions in Practice (EFPs) measures student engagement of three different types of EFPs during math learning moments.
- The measure was developed within the context of collaborative, open-ended problem solving; however, it can be adapted for use to understand EFPs that occur in other math learning moments.

Measure Details

- The qualitative rubric consists of 10 items across three types of EFPs:
 - Working Memory: 3 items
 - Cognitive Flexibility: 3 items
 - Inhibitory Control: 4 items
- All items are measured on a 4-point scale, ranging from -1 to +1. After items are scored for the selected math moment, average scores for each type of EFP can be calculated, as well as an average EFP score aggregating across categories.
- This rubric was developed for use with middle school students.

Contribution to the Field

- Executive function skills have historically been studied using abstract tasks in clinical or laboratory settings. This rubric aligns with the paradigm shift to conceptualizing executive function skills as context-dependent, allowing for nuanced understandings of the dynamic, contextualized nature of how EF skills are engaged.
- This qualitative rubric leveraged research-based descriptions of EF skills to construct items focused on identifying the ways students activate and practice their EF skills in a mathematics learning context. The rubric items each reference its source materials.

Accessing the Measure

- You may access the measure here:
 - Renninger, K.A., Benke, G., Böheim, R., Corven, J., De Dios, M.C., Hogan, M.R., Kyaw, M.H., Michels, A.G., Nakayama, M., Nunez, P.T., Werneck, H., & Yared, F. (2025). Exploring math moments: Middle-schoolers' phases of problem-solving,

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Last updated 11.4.25

executive functions in practice, and collaborative problem solving. *Frontline Learning Research*, 13(2). <https://doi.org/10.14786/flr.v13i2.1371>

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