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The Effectiveness of Executive Function Training on the Dimensions of Metacognition in Students with Learning Disabilities

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1. Round 1

1.1. Reviewer 1

Reviewer:

In paragraph 1 of the Introduction, the discussion of learning disabilities (“Learning disabilities represent a significant challenge…”) would benefit from a clearer linkage between deficits in executive functions and their measurable educational outcomes (e.g., reading, writing, or math). Adding recent prevalence or diagnostic statistics could strengthen the contextual grounding.

In Study Design and Participants, the paragraph describing sampling notes both “purposefully selected” and “randomly assigned”. Clarify how purposeful selection and randomization were combined, as this affects internal validity. Specify whether stratified randomization was used to balance characteristics across groups.

The list of inclusion criteria includes “significant impairment in academic achievement that interfered with school performance.” It would be useful to mention the standardized test or diagnostic benchmark used to define “significant impairment,” ensuring replicability.

The Measures section provides reliability coefficients for the Wells Metacognition Questionnaire but lacks citation of local validation studies (Iranian context). Consider citing the most recent Iranian adaptation study or explain whether a pilot reliability test was performed in the current sample.

In the Intervention section, each session is described in detail, but it is unclear whether the same instructor conducted all sessions, or if inter-rater reliability/fidelity checks were used. Add information on trainer qualifications and fidelity monitoring procedures to enhance methodological transparency.

In the paragraph beginning "Before conducting the main inferential analysis…", you mention that assumptions for ANCOVA were satisfied, but no specific test statistics (e.g., Levene's F or K-S values) are given. Including these briefly in a table or appendix would demonstrate thoroughness.

Authors revised the manuscript and uploaded the document.

1.2. Reviewer 2

Reviewer:

In paragraph 2, you cite Roebers (2017) and Fernandez-Duque et al. (2000) to explain the relationship between executive functions and metacognition. However, the theoretical link between the two is stated descriptively rather than analytically. Consider adding a conceptual diagram or explicitly stating how these frameworks informed the intervention structure.

The paragraph beginning "Emerging research underscores that impaired executive functioning is closely tied to difficulties in metacognitive control…" contains several high-quality references but lacks critical synthesis. You may strengthen this paragraph by explaining whether these findings come from clinical, developmental, or educational contexts, since that distinction is crucial for interpreting generalizability.

In paragraph 5, the statement "Interventions designed to improve executive functions have shown considerable promise…" could be strengthened by explaining why the chosen executive function training (ten sessions) aligns with prior evidence. For example, provide a rationale for duration, intensity, or content of sessions compared with previous empirical protocols.

The final paragraph of the Introduction states "The city of Bandar Abbas, with its diverse educational context, offers an appropriate setting…" but does not specify what "diverse educational context" entails (e.g., socio-economic, linguistic, or educational diversity). Clarifying this adds contextual credibility and supports external validity.

In the first discussion paragraph, the link between improved metacognition and executive function training is asserted but not mechanistically explained. Consider elaborating on the cognitive processes (e.g., inhibition control, working memory) that may underlie this observed enhancement.

The paragraph beginning "Furthermore, the results of this study underscore the neurocognitive mechanisms…" references neural circuits (prefrontal cortex, ACC, parietal regions). It would strengthen the paper to relate these mechanisms back to observable behavioral improvements or to cite any neurobehavioral models of metacognitive development.

The paragraph starting "Another important dimension of these results lies in the developmental relationship…" appropriately invokes Roebers (2017), but you might extend this discussion by suggesting how executive training can be developmentally tailored for different age groups or learning stages.

Authors revised the manuscript and uploaded the document.

2. Revised

Editor's decision: Accepted.

Editor in Chief's decision: Accepted.

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