

“I think a lot of kids could have progressed further, but was that the point of the game?”: Exploring preschool teachers considerations of a gamified tablet assessment of executive functioning

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Overview

Background

- Preschool teachers need to minimize screen time in the classroom
- Overburdensome workloads in early childhood persist
- Many states now require evidence-based assessment in preschool
- Direct assessments are preferable to teacher-reports, reducing implicit bias and providing teachers with new information about their children, that may in turn influence their interactions with the children

The Current Project

- Pilot of a gamified, child-directed tablet assessment of executive functioning (EF) in early childhood.
- Based on the widely used global EF measure, Head-Toes-Knees-Shoulders Revised (HTKS-R), HTKS-Kids trains children to say and then do the opposite, by tapping a panda bear on the screen (e.g., tap panda’s head, when told to tap its toes)

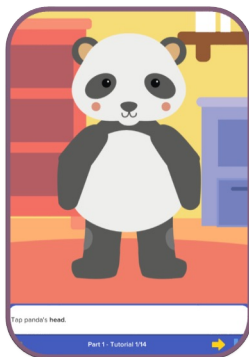
Methods

Participants:

- 79 children
 - 4.4 (3.9-4.9) y
 - 49% female
 - 78% WIC subsidy
- 10 teachers
 - 90% between 29-39y
 - 80% female
 - 60% hold a Master’s

Measures:

- Family & teacher demographics
- Focus groups
- User experience survey



Analysis

Research Questions:

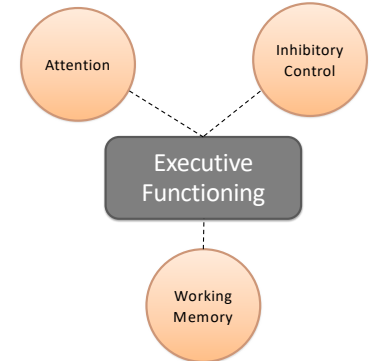
- (1) Do preschool teachers think HTKS-Kids is a feasible way to assess EF inside the classroom?
- (2) What are preschool teachers perceptions of EF in early childhood?

RQ 1:

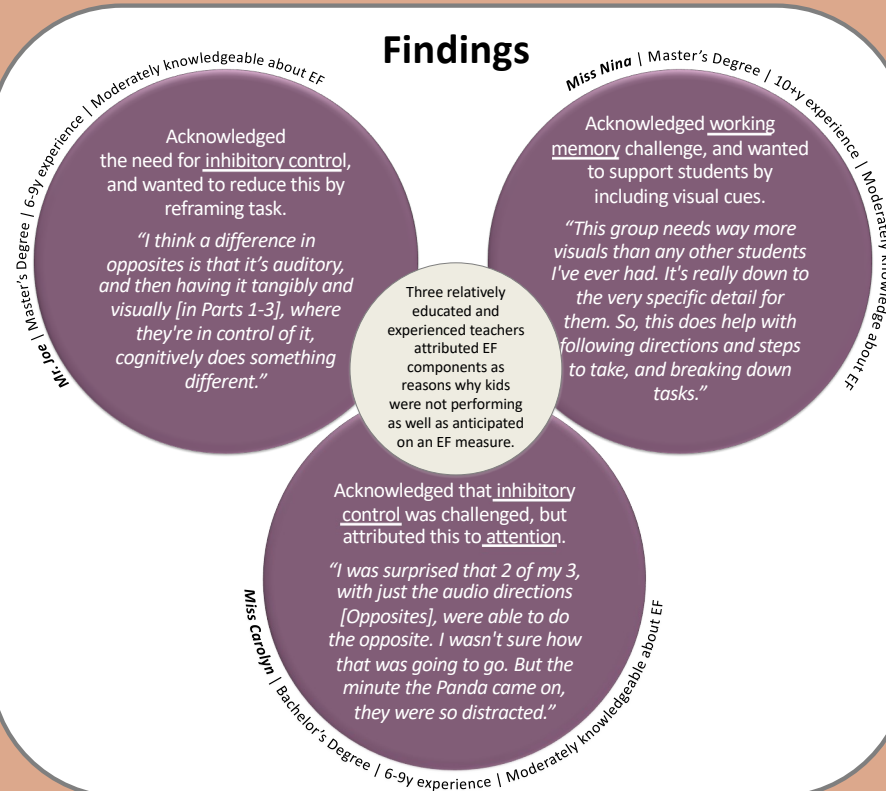
- Approach: Narrative
- Coding: Inductive & thematic
- High Level Finding:
 - 1) HTKS-Kids is relatively feasible across teachers with minimal recommended changes

RQ 2:

- Approach: Phenomenology
- Coding: Deductive
- Inclusion criteria: ≥9 quotes indicative of EF constructs (n=3)
- High Level Finding:
 - 2) Teacher perceptions of EF seem inconsistent



Findings



Discussion

Key Takeaways:

1. HTKS-Kids is a feasible tablet assessment of EF within the preschool classroom context.
2. When EF was referenced colloquially by teachers, it was in reference to why the kids did not progress farther and how we could change the app so that they would.

Implications:

- Early childhood educators may lack the lens that EF is on a developmental continuum, rather viewing it as a concrete and isolated skill.
- More research and increased awareness and education about EF would allow preschool teachers to better support this kindergarten-readiness skill.

References

- Cameron Ponitz, C. E., McClelland, M. M., Jewkes, A. M., Connor, C. M., Farris, C. L. & Morrison, F. J. (2008). Touch your toes! Developing a direct measure of behavioral regulation in early childhood. *Early Childhood Research Quarterly*, 23, 141-158. <https://doi.org/10.1016/j.ecresq.2007.01.004>
- Division for Early Childhood of the Council of Exceptional Children. (2014). *DEC recommended practices*. <https://divisionforearlychildhood.agnetye.com/dl/7urlPWCSUJ/>
- Gonzalez, C. R., Bowles, R., Geldhof, G. J., Cameron, C. E., Tracy, A., & McClelland, M. M. (2021). The Head-Toes-Knees-Shoulders Revised (HTKS-R): Development and psychometric properties of a revision to reduce floor effects. *Early Childhood Research Quarterly*, 56, 320-332. <https://doi.org/10.1016/j.ecresq.2021.03.008>
- Graziano, P. A., Garb, L. R., Ros, R., Hart, K., & Garcia, A. (2015). Executive functioning and school readiness among preschoolers with externalizing problems: The moderating role of the student-teacher relationship. *Early Education and Development*, 25(5), 573-589. <https://doi.org/10.1080/10409289.2016.1102019>
- Schaack, D. D., Le, V., & Steadron, J. (2020). When fulfillment is not enough: Early childhood teacher occupational burnout and turnover intentions from a job demands and resources perspective. *Early Education and Development*, 31(7), 1011-1030. <https://doi.org/10.1080/10409289.2020.1791648>