

## Introduction

- Interactive technology has been found to enhance some skills, such as reading comprehension, math, and specific content knowledge.
  - An augmented reality program increased 7- to 8-year-old children's knowledge of scientific concepts (Lu & Liu, 2015), and tablet games were found to benefit second grade students' math skills (Hung, Sun, & Yu, 2015).
- In studies of literacy development, interactive technology is beneficial only under certain conditions.
  - Apps improved reading comprehension when tested against traditional classroom lessons (Lysenko & Abrami, 2014) but multimedia stories are only facilitative if the additional features (e.g., animations or music) are relevant and not excessive (Bus, Takacs, & Kegel, 2015).
  - A meta-analysis revealed that multimedia stories are no more beneficial to children's reading comprehension than sharing a traditional print story with an adult who scaffolds (Takacs, Swart, & Bus, 2014).

### The present study:

Do elementary school-aged children recall more information about a novel concept when the information is provided on a tablet or by an adult in a face-to-face setting?

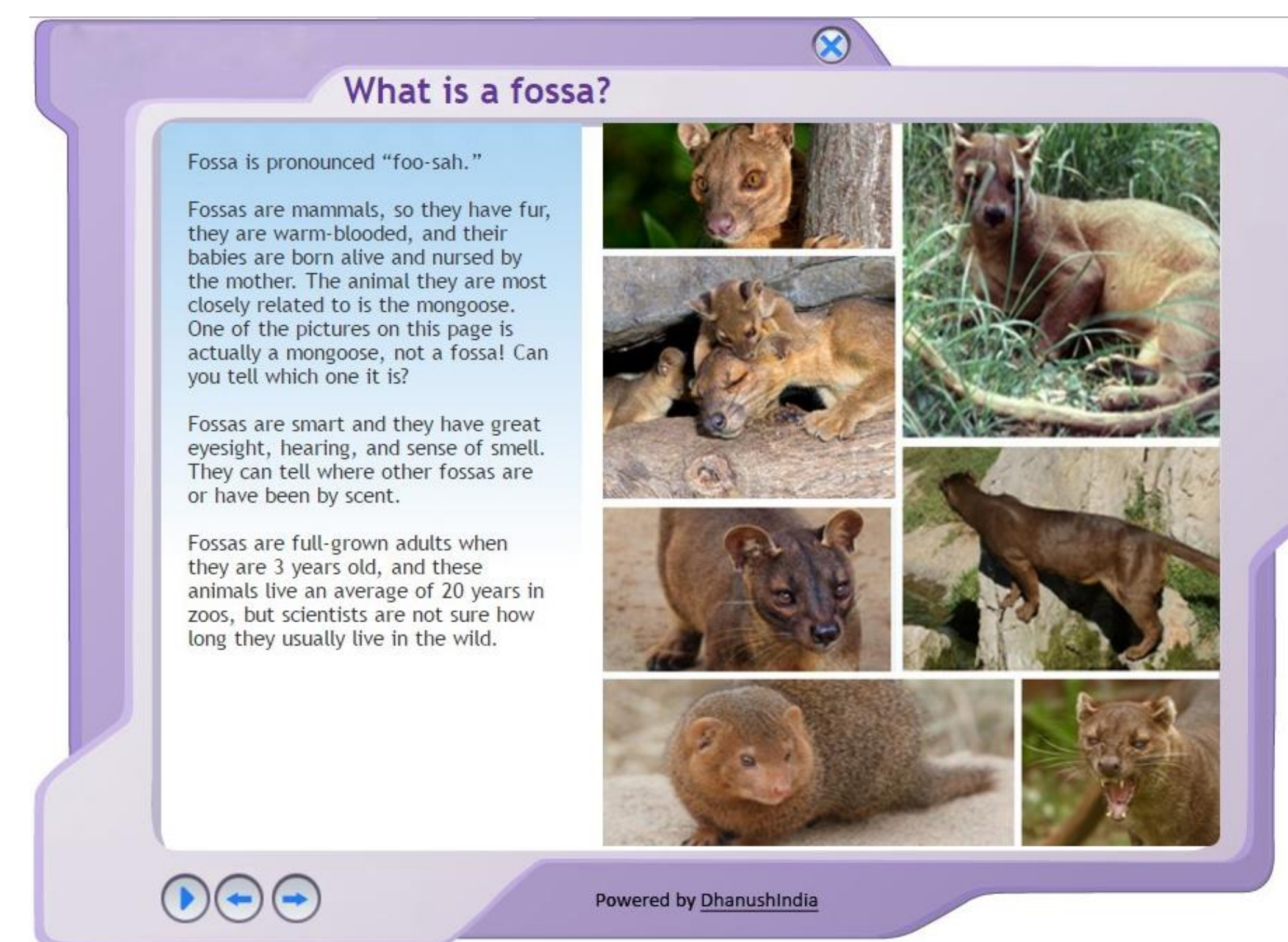
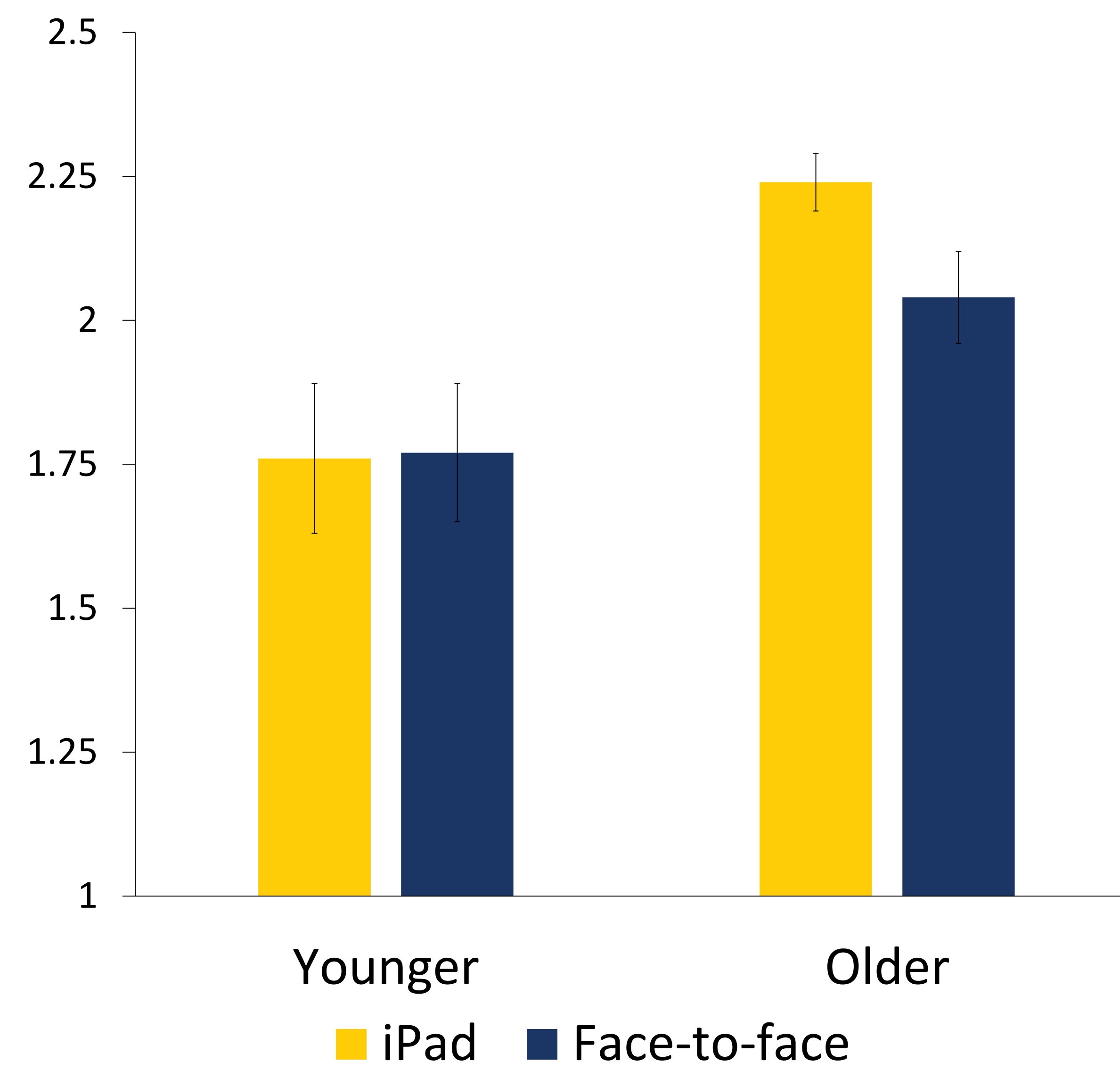
## Method

- Sixty 5- to 8-year-olds ( $M = 84.28$  months,  $SD = 13.77$ , 30 female)
  - Two age groups: younger (61-81 months,  $M = 70.92$ ,  $SD = 7.35$ ) and older (82-107 months,  $M = 93.83$ ,  $SD = 8.11$ )

### Procedure

- All participants received two separate 5-minute lessons: the appearance, diet, habitat, and habits of an animal (the fossa) and the geography, culture, politics, and economy of a country (Luxembourg). Topic order was counterbalanced.
- Participants were randomly assigned to one of two learning conditions:
  - iPad:** Participants learned about the concepts with researcher-designed websites on an iPad.
  - Face-to-face:** To produce a traditional learning setting, the researcher read and presented the information about the concepts with printed scripts and pictures.
- After each lesson, the researcher administered a 15-question free-response quiz orally.
  - Ex: "How long do fossas live?"

Fossa Quiz Scores



## Results

- A 2 (age group: younger vs. older) X 2 (condition: iPad vs. face-to-face) X 2 (order: fossa vs. Luxembourg first) X 2 (domain: fossa vs. Luxembourg) mixed ANOVA, with domain as a repeated measures variable
- Main effect of domain, where children answered more questions correctly about fossas:  $F(1,52) = 57.54$ ,  $p < .001$
- Main effect of age group, where older children answered more questions correctly than younger children:  $F(1,52) = 11.77$ ,  $p = .001$
- Age group X Condition:  $F(1,52) = 3.37$ ,  $p = .072$ 
  - To explore the interaction, separate  $t$ -tests were performed for younger and older children. These revealed an effect of condition for the older children for the fossa questions,  $t(33) = 2.02$ ,  $p = .051$

## Discussion

- As expected, older children outperformed younger children in both domains.
- Learning from the iPad only benefitted older children and only for one of the topics. One possibility is that the benefit from learning from the iPad emerges in highly satisfying learning situations (e.g., Hung, Sun, & Yu, 2015), and that animal learning for the older children captures this level of engagement.
- These results are consistent with findings that children begin to show preference for technological informants around 6 years of age (Eisen & Lillard, 2016).
- Because many educational apps are largely interactive, future research could investigate whether more interactive media contribute to sustained attention and consequently the effectiveness of the technology.

## References

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