

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?

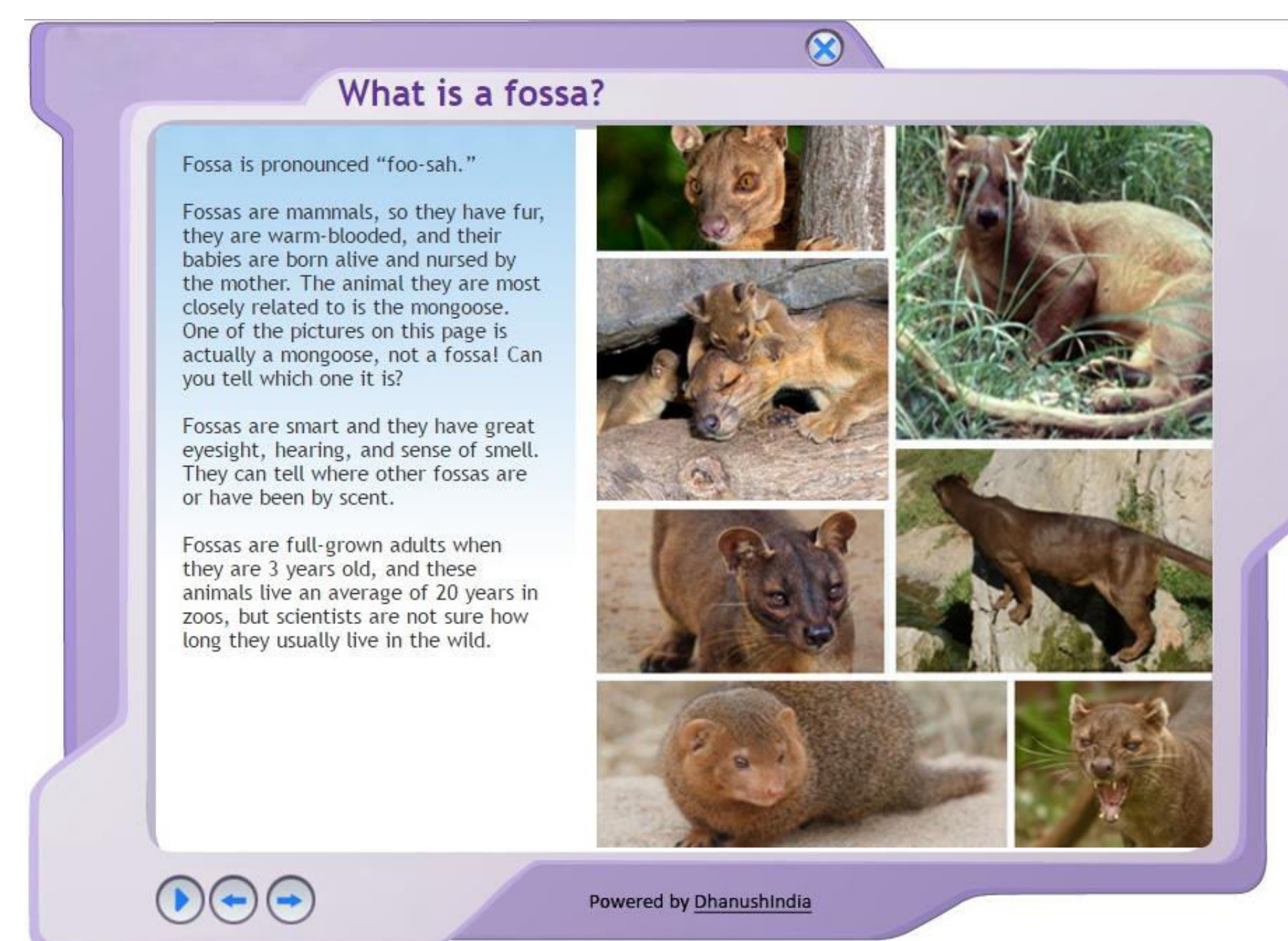
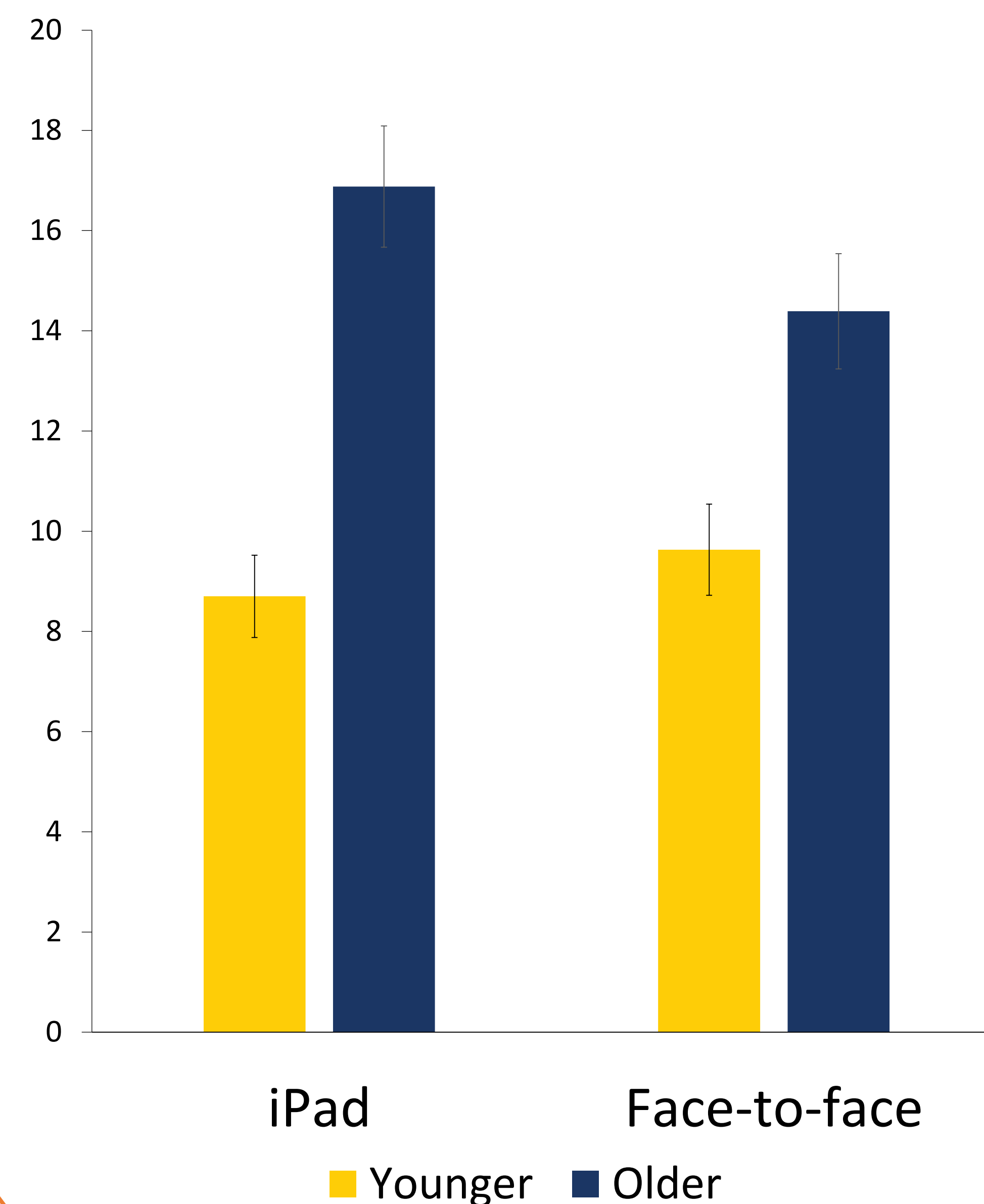
Method

- Seventy-three 5- to 8-year-olds ($M = 84.56$ months, $SD = 14.06$, 38 female)
 - Two age groups: younger (61-81 months, $M = 70.90$, $SD = 7.40$) and older (82-107 months, $M = 94.64$, $SD = 7.86$)

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?"

Composite 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 (sex) between-subjects ANOVA
- Main effect of age group, where older children answered more questions correctly than younger children: $F(1,57) = 20.2$, $p < .001$
- Age group X Condition: $F(1,57) = 3.3$, $p = .074$
 - To explore the interaction, separate t -tests were performed for each condition. These revealed a large effect of age group for the iPad condition, $t(33) = 5.2$, $p < .001$, $d = 1.86$, and a relatively smaller effect of age group for the face-to-face condition, $t(36) = 3.0$, $p = .004$, $d = 1.02$.

Discussion

- As expected, older children outperformed younger children in both conditions.
- Results suggest that as children get older, they may benefit slightly more from using an iPad to learn new conceptual information as opposed to receiving a face-to-face lesson. Seven- to 8-year-old children express high satisfaction when using interactive technology to learn scientific concepts (e.g., Hung, Sun, & Yu, 2015), so older children in the iPad condition may have been more engaged in the lesson.
- 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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