

# Exploring the usability of mobile augmented reality interactions in relation with primary school students' level of cognitive abilities

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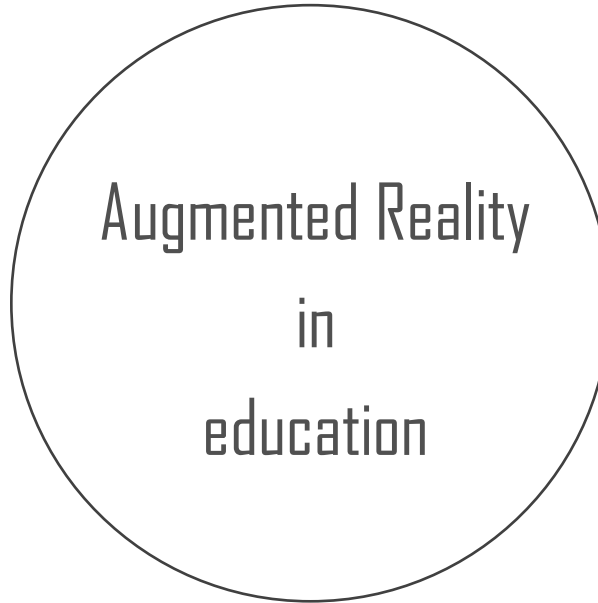
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# The problem

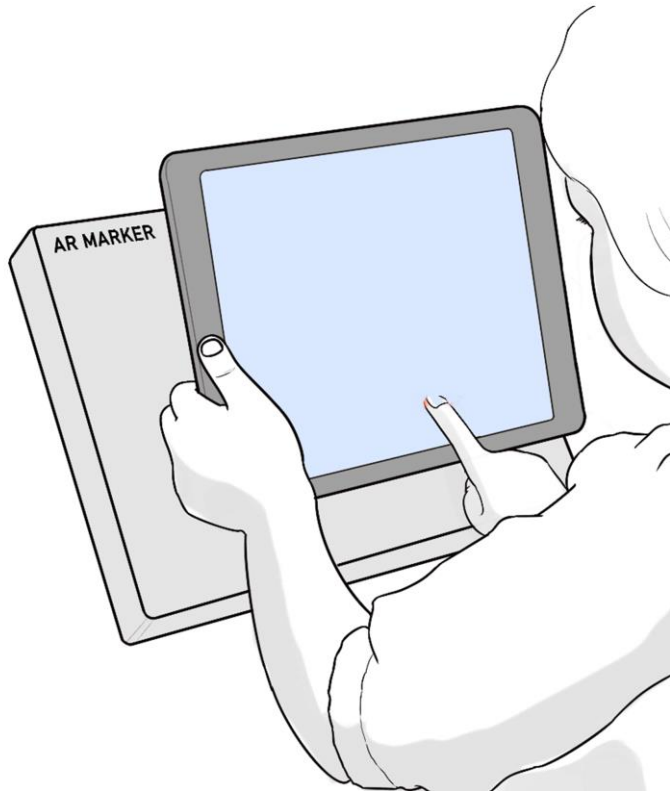


- Enhances the comprehension of spatial and conceptual knowledge
- Improves long-term memory retention
- Fosters collaborative learning
- Increases student motivation



- May lead to cognitive overload
- AR content has the potential to distract students
- Usability issues (Complex for young users)

## The problem



Developmental psychology reveals that children possess distinct capabilities and limitations that set them apart from adults. As a result, certain AR designs may be perceived as easy to use by children, while others might prove challenging, depending on their developmental stage. To fully capitalize on the benefits of AR, it is essential to design AR experiences with these unique capabilities and limitations of children in mind.

**Currently, the AR design community lacks a systematic understanding of how to create AR experiences tailored specifically for children.**

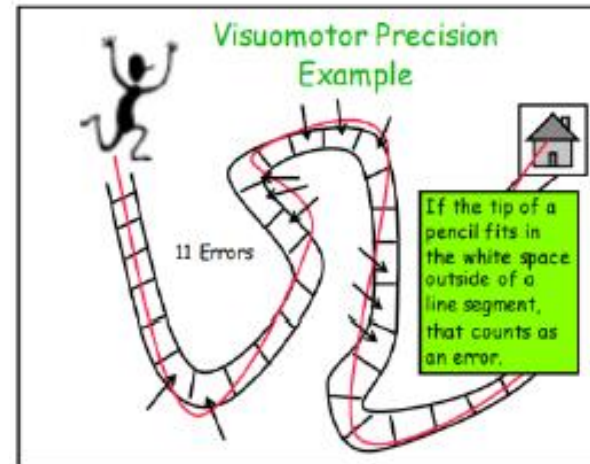
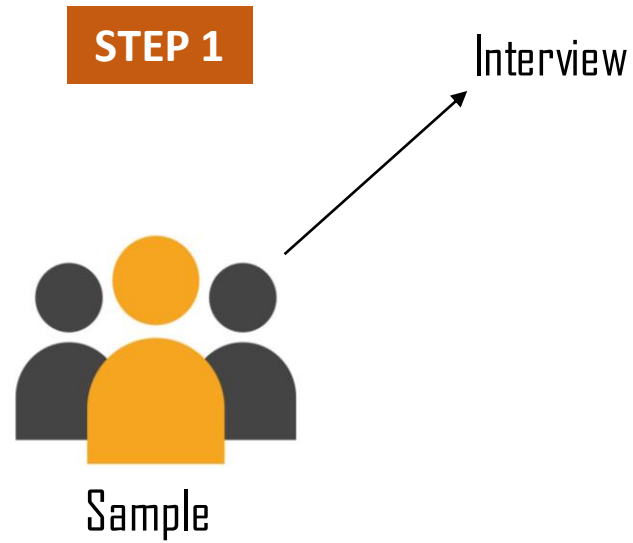
# The objectives

The present research aims to understand how children's level of motor and spatial abilities relate to the use of certain interaction types of mobile AR.

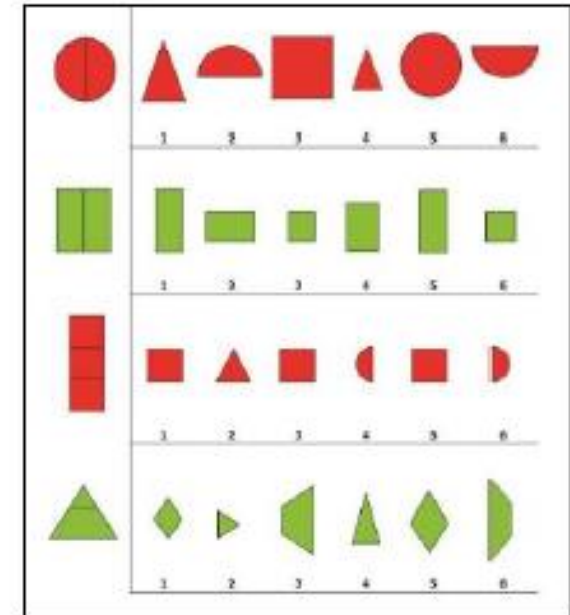
## Research questions:

- How do students' age and level of motor and spatial abilities relate to user experience and performance in mobile-AR?
- How do different interaction types of AR compare in terms of young children's user experience and performance in mobile-AR?
- What types of usability issues are experienced by primary school students in mobile-AR?

# Experimental design



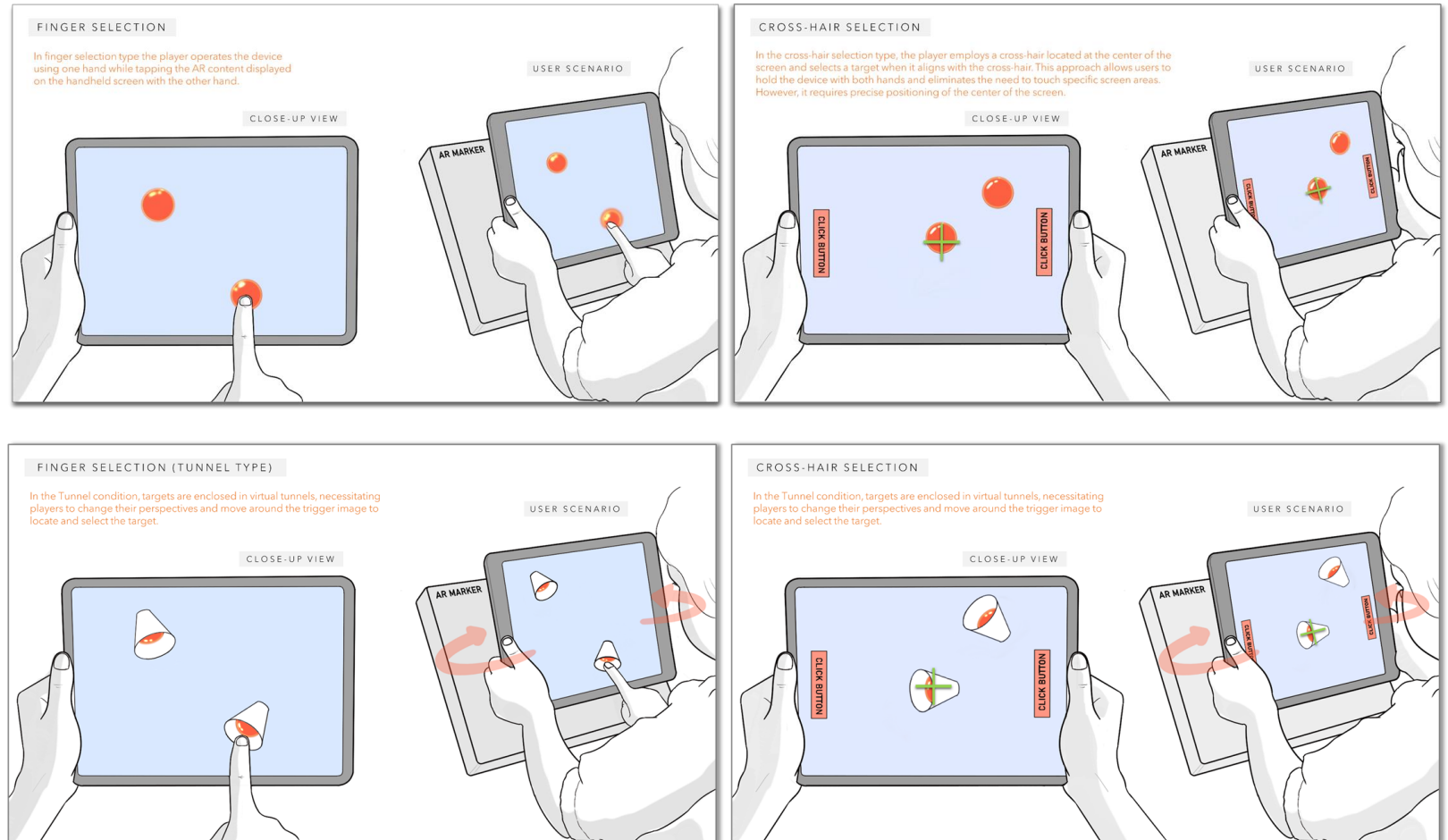
Visuomotor Test



Spatial Relations Test

# Experimental design

STEP 2



Four stages of AR game

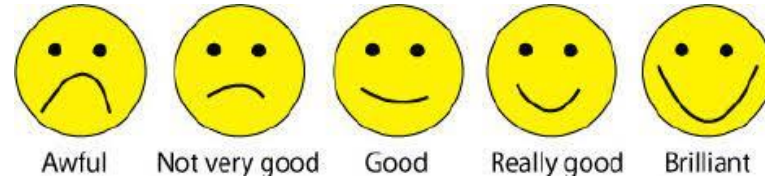
# Experimental design

STEP 3



Sample

Smileyometer for self reported usability metrics



Game logs for performance data for each stage



Video recording for usability issues

## Potential impact & added value

Guidelines for designing  
age-appropriate AR  
interactions for education

### Educators | Technology designers

- ✓ may identify designs that might present usability challenges for children due to the need for using still-developing abilities
- ✓ help educators in creating and utilizing designs that encourage, train, or educate children by directly incorporating or working around their still-evolving abilities
- ✓ may assist educators in understanding the reasons behind children's difficulties with existing designs and help them develop modifications that align better with the children's capabilities



**Thank you**