

# **Exploring Elementary Students' Perception and Engagement of Reading** using an Augmented Reality Educational Technology Application

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### Introduction

**Purpose:** This study explores how elementary students perceive an AR reading app, focusing on game-based learning features to boost prereading engagement.

**Context:** Over five weeks, six students participated in iterative co-design sessions, contributing feedback and using the AR app as mini researchers.

**Objective:** To understand students' perceptions, engagement factors, and barriers related to the AR reading app.

### AR Technology – A Reading App



- **3D Animations:** AR elements of ocean animals make learning visual and interactive.
- **Game-Based Learning:** Mini-games like Aquarium Game and Bubble Pop Quiz enhance science and reading skills.
- **Instant Feedback:** Games offer immediate feedback and hints, aiding self-learning.
- User-Friendly Interface: Designed for easy navigation to boost young learners' independence.

### Methodology

- **Co-design process:** Collaboration with six students over five weeks to develop the AR reading app (Figure 1).
- Case study approach was designed to gain an indepth understanding of the interactions, user experiences, and perceptions of six elementary students participating in the co-design process of an AR reading app.
- **Multiple Data Sources:** 
  - Student interviews for three groups to get insights of the AR app.
  - Teacher interview for insights on student engagement.
  - Student artifacts (drawings, wish lists, game ideas) to capture perceptions and design reflections.
  - Observation notes during sessions for documenting design features and perceptions.
- **Data analysis:** Thematic analysis using MAXQDA with a focus on inductive approaches.

### Results

### **RQ 1.** How do 3rd-grade readers perceive an AR reading app?

examples):

- Excitement about AR Enhancing Pre-reading Engagement and
- Motivation
- Sparking Imagination



Figure 3. Students were engaging with the AR reading app. Discussions across groups were observed mainly in the classroom.



Figure 1. Co-Design process of the AR Reading app



Figure 2. Students' group artifacts depicting their favorite AR app aspects and wish lists.

Themes identified from multiple qualitative data (Please refer to the paper for detailed results, quotes, and



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### **RQ 2. What specific AR game-based** learning elements/features engage **3rd-grade students in relation to** prereading engagement?

Themes identified from multiple qualitative data (Please refer to the paper for detailed results, quotes, and examples):

- Game-Based Learning Design
- Student Autonomy
  - Increase Self-Learning Ο
  - Increase Independence Ο
- **Interactive AR Elements** 
  - Customizable Elements Ο
- Audio Feature

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### Discussion

- The AR reading app's role in increasing student independence and engagement.
- Importance of co-design in fostering ownership and positive learning experiences.
- Providing insights for future AR educational technologies and classroom integration.
- Enhancing early reading development and pre-reading activity through interactive elements.

## Limitations

- Findings are based on a small, specific sample in a classroom setting.
- Short duration: Five-week study period may not capture long-term learning experience.

# Conclusion

- The **AR reading app** shows promise in engaging young learners and enhancing their pre-reading activity.
- **Co-design approach** is promising in involving young students in the development process.
- This study highlights the potential of **AR** educational technology as a pre-reading educational content.

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