

# Moravian History Mystery

An Outside Augmented Reality Game for Elementary History



# The problem

- Social studies is overshadowed. There is more and more time spent on math and language arts.  
(Zhao & Hoge, 2005; Lee, 2008 )
- Students find social studies boring and not relevant  
(Zhao and Hoge, 2005).



# The opportunity

- Games can be engaging.  
(Kiili, 2005; Sweetser & Wyeth, 2005; Bressler, 2014)
- Some games have been shown to improve learning outcomes.  
(Van Eck, 2006; Steinkuehler and King, 2009)
- My interests lie with:  
Mobile, Digital, Augmented Reality Games





Mobile ➡ AR ➡ History in Context

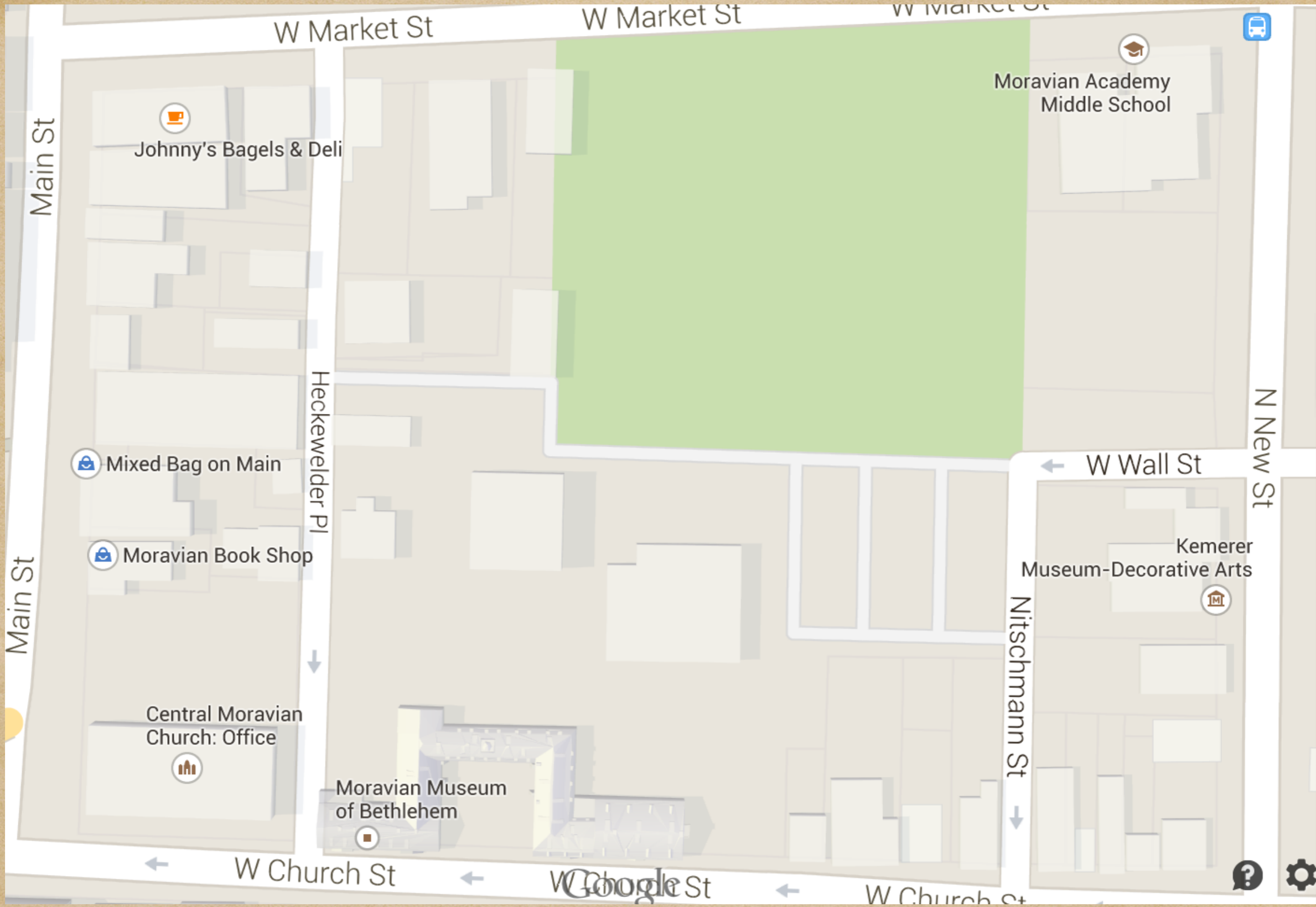
# Research Questions

1. What **flow** experiences do young elementary students have while playing a mobile digital augmented reality game?
2. What relationship exists between young elementary students' mobile digital augmented reality game based learning experience and their **learning outcomes**?
3. What are the **attitudes** of young elementary students regarding this type of game based learning?
4. (+ A lot of unanticipated exploration of the design process)

# Moravian Academy 2nd Grade

- ◆ 3 classes
- ◆ 3 teachers
- ◆ Located in historic district
- ◆ Colonial Moravian History is part of the current curriculum.





W Market St

W Market St

W Market St

Main St

Johnny's Bagels & Deli

Moravian Academy Middle School

Mixed Bag on Main

Moravian Book Shop

Central Moravian Church: Office

Moravian Museum of Bethlehem

W Wall St

Kemerer Museum-Decorative Arts

Main St

Heckewelder Pl

Nitschmann St

N New St

W Church St

W Church St

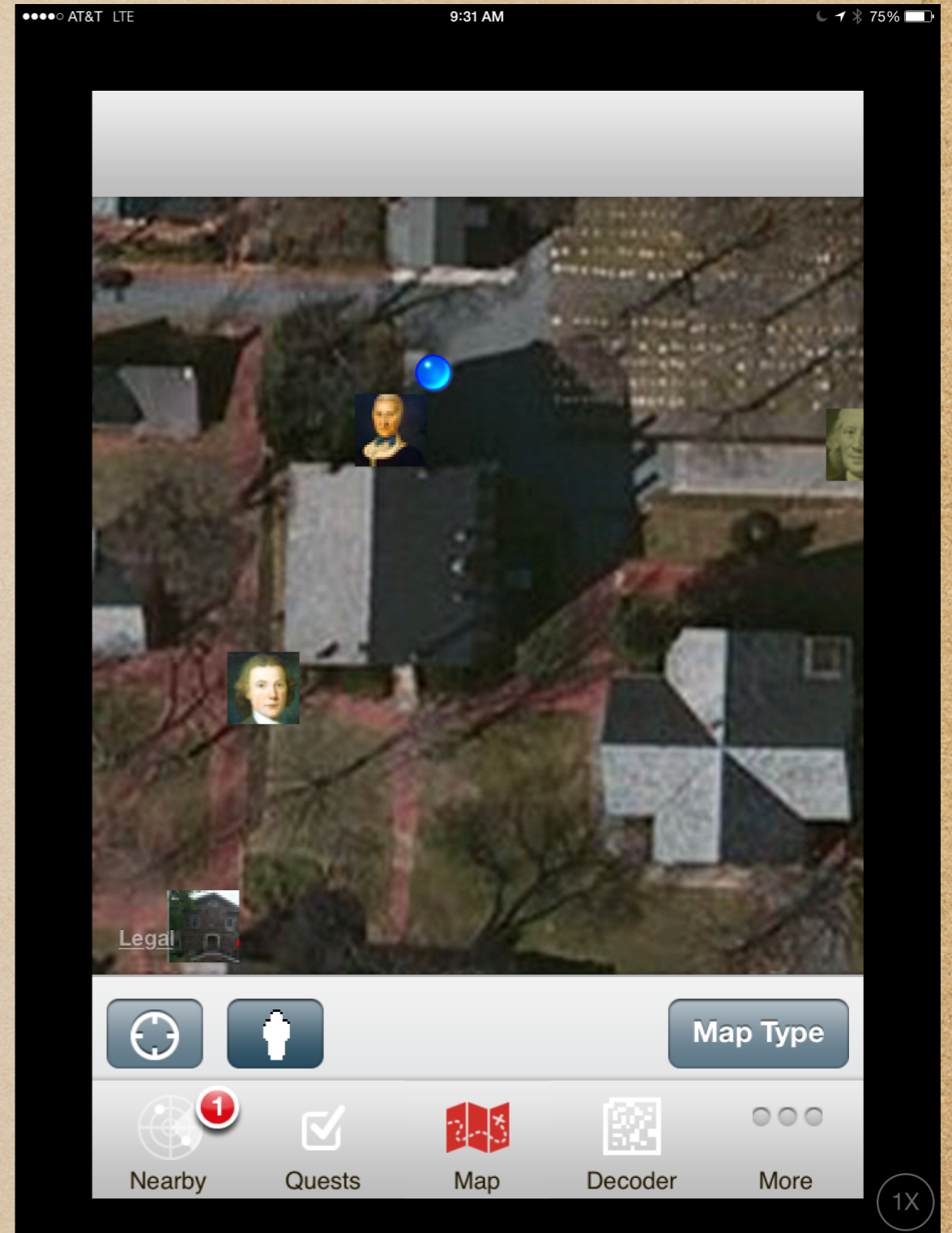
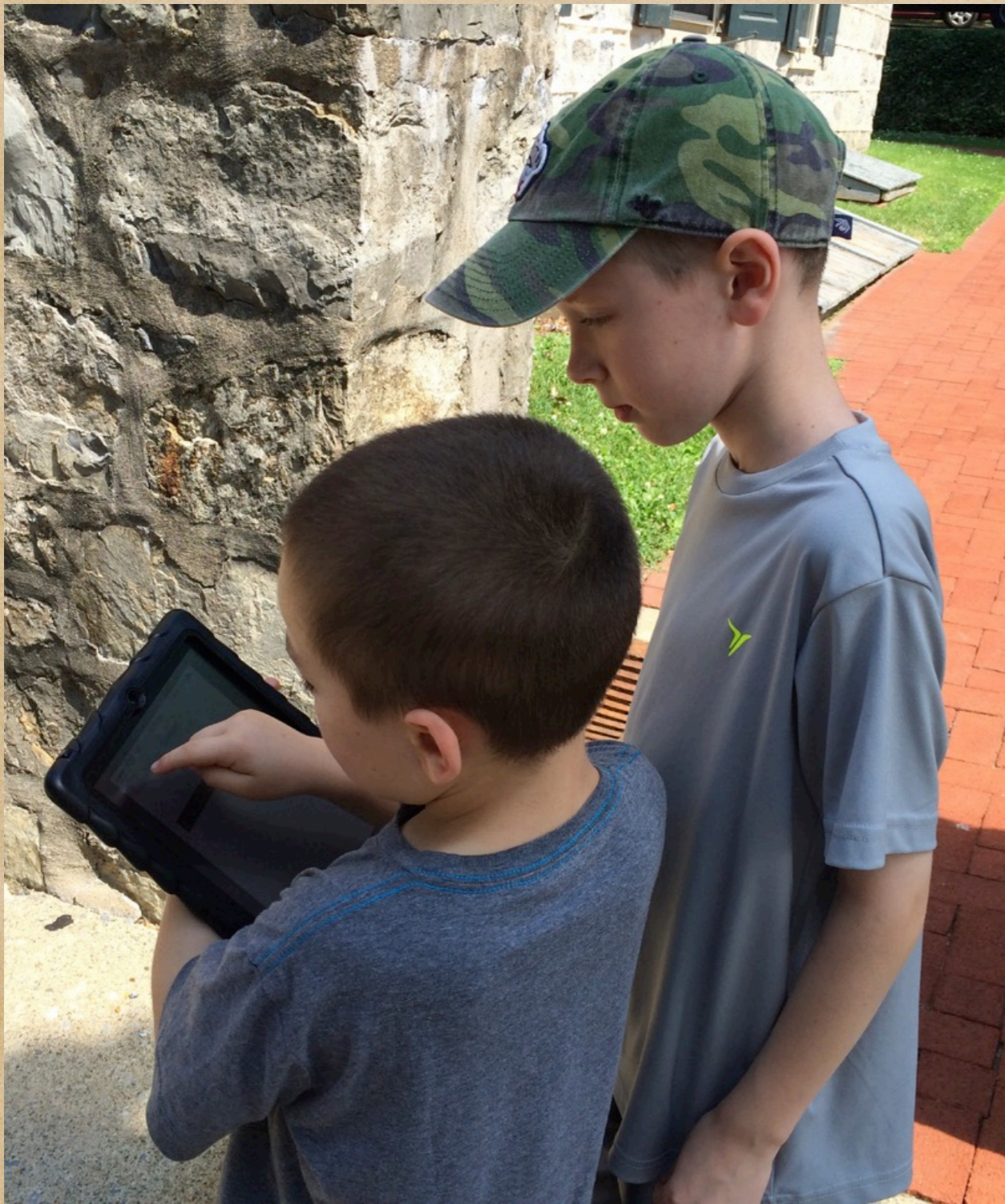
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# Methodology

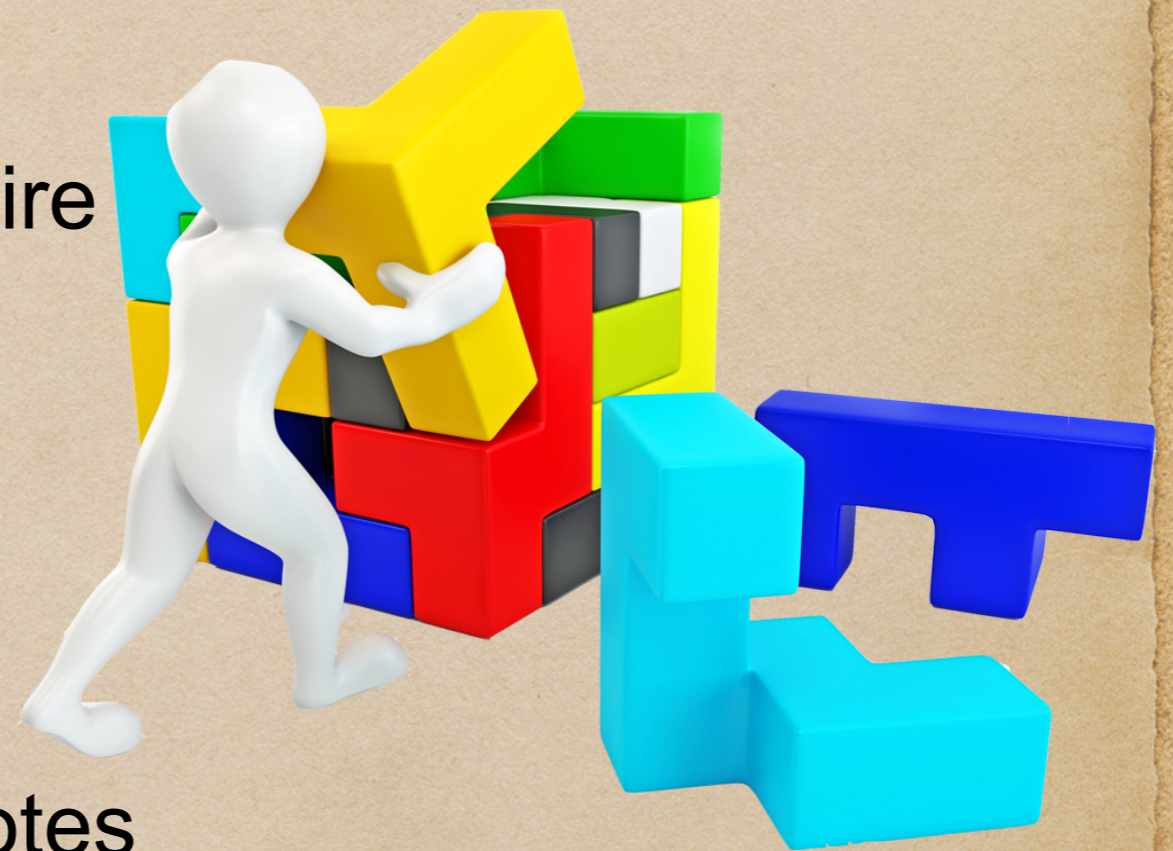
<b>UNITS</b>	33 second graders aged 7-9; grouped in pairs or triads determined by teachers	21 females & 12 males	3 Classes of 10-13 students; 5-7 pairs or triads
<b>TREATMENTS</b>	Groups played AR iPad Game	Teacher-led class debrief sessions after each play session	
<b>OBSERVATIONS</b>	Assessed flow rates of groups through <b>observations</b> , assessed individual flow rates through <b>survey</b> , post-treatment full class <b>debrief</b> , and selected student <b>interviews</b> (RQ1)	Assess individual learning through teacher-designed curriculum-aligned <b>post-test, debrief, and interviews</b> (RQ2)	Measured individual gaming attitudes through <b>survey</b> (RQ3)
<b>SETTINGS</b>	Historic district and school campus	Classroom for debrief	School conference room for interviews
<b>TIMING</b>	Each class had 2 play sessions within 5 days.	All classes participated over a 3 week period.	





# Data Analysis

- Qualitative data is being used to triangulate and contextualize quantitative findings.
- Quantitative sources:
  - Game Attitudes Questionnaire
  - Flow Questionnaire
  - Observer Flow Ratings
  - Post-unit test scores
- Qualitative sources:
  - Observer and researcher notes
  - Post-play debrief sessions
  - Teacher interviews and short answer questionnaire
  - Student interviews



# Preliminary Findings - Flow

- Students experienced **high rates of flow**, (N = 33), M = 4.44, SD = 7.30.
- Observations, field notes, and debrief session transcripts support this finding of flow.
  - Literally running to get from place to place
  - SKIPPING from task to task.
  - Sense of presence: "Sometimes, I felt like it was so real that I almost wanted to touch it, like shake the person's hand."
  - "We leveled up! Yes!"

# Preliminary Findings - Learning

- "History at this age, is difficult .... because they are so into the here and now. ...[I]t helped to spark their interest. It was also nice for them to know some information to give input as we continued learning. You hit very important information that they need to remember so hopefully the game is reinforcing that."
- "Not only was the game a perfect enrichment activity, but the students who may be less focused in the classroom seemed to grasp and retain more information from this type of experience."
- "As we were reading through the information, they would make references to things they learned in the game or things they did in the game. I think that's a little bit empowering for them because they're like hey, we already know about this. Whereas before, they didn't know anything until we told them."

# Design – Learning along the way

Teachers provided valuable insights that guided the researcher's design process.

- “I thought the designer did a great job of constructing sentences on **a second grade reading level**. Also, the... **activities were challenging, yet interesting enough that the students were always engaged**. I liked the idea of letting the children use our entire campus. **Lots of movement** with little kids--smart! Chasing chickens--how much fun is that!”
- Teacher speaking to the build/test/rebuild process of game design: "I think it was really important because I was at the **first one which seemed good** because I had nothing to compare to until **you kept doing it again** and I was like 'wow, this is huge', I mean it was a **huge difference**"

# Design

- Geospatial skills required significant scaffolding.
- Need to calibrate reading requirements and pace of game to meet the needs of 2nd grade.
- Students generally liked to be challenged by the game.
  - "When we had to find the first place of worship, we were wrong but it didn't bother us, so making mistakes and having to try again again, it was a game."
- Certain types of gaming activities were popular and well received such as collecting items, typing codes, and figuring out the right order.

# Design

- Working in pairs provided many opportunities for peer scaffolding and replicated the often-social nature of gaming.
- "I know the child's personality, the one whose a little bit higher, he probably would have been a little pushier in the classroom. As opposed to the game. And he was just enjoying the game so much. I really think that helped him be a helper. To succeed with the game."
- Minor technical issues were not distracting enough to pull students out of the "magic circle".
- Curriculum content needs to be an active part of the game experience and not provided as "additional info".

# Implications for Future Research

- ◆ “Serious games” can be successful with younger elementary students.
- ◆ Augmented reality can create immersive, in-context, learning for social studies.
- ◆ Teachers were instrumental in design process.
- ◆ Use of “teams” captures social nature of gaming which may enhance peer-scaffolding for play AND learning.
- ◆ Self-reporting of flow scores may take “practice” for young participants.



# Next Steps...

- . Complete data analysis
- . Publish!
- . Begin work on dissertation game!



# Questions?

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