

# Chapter 57

## The ScavengAR Hunt: An Augmented Reality Teacher Training Case Study Using Mobile Devices

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### ABSTRACT

*This chapter explains the design and execution of a pre-service teacher training case study using Augmented Reality (AR), Quick Response (QR) codes, and social media mobile applications installed on iPads. The ScavengAR Hunt activity centered on a story narrative inspired by works of fine art using trigger images from the AR mobile application ARART® and incorporated elements of the board game Clue®. Pre-service teachers in the study were divided into groups of 4-6 and assigned specific, individual roles related to a mobile application used in the ScavengAR Hunt, and completed specific tasks while exploring the campus of a midwestern university. The research monitored the groups in real-time through reports submitted on Twitter and responses from QR code scans. The ScavengAR Hunt served as a model for designing a mobile learning activity incorporating multiple mobile applications.*

### INTRODUCTION

This chapter focuses on the design process of an activity utilizing mobile devices and mobile applications in an advanced instructional technology course informed by research on Augmented Reality (AR), game design, mobile device usage in the classroom, and instructional design. The ScavengAR Hunt sought to incorporate multiple mobile devices and mobile applications into a collaborative group activity, where each group member contributed to group success by completing specific tasks at four different on-campus locations requiring the use of mobile devices and mobile applications.

Content for the ScavengAR Hunt revolved around target images for multiple AR mobile applications, a technology unfamiliar to the pre-service teachers. The ScavengAR Hunt was intended to serve as a model for pre-service teachers to potentially duplicate in the future, adjusting the specifications of the activity to meet the needs of the content and audience. For most pre-service teachers, this meant

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elementary school students. Five different sections of pre-service teachers in an advanced instructional technology course participated in the ScavengAR Hunt over the course of one academic year. The ScavengAR Hunt was designed as an instructional game, focusing on the ability of pre-service teachers to use mobile devices effectively in a socially interactive context. Its design incorporates three basic elements: rules of a game, the use of mobile devices (iPads and smartphones) and mobile applications to complete the game, and a collaborative activity allowing the instructor and peers to provide feedback to each other during the activity.

## Design

Schute, Rieber, & Van Eck (2012) acknowledge there is currently a lack of experimental studies examining the effectiveness of using games in learning environments. However, they identify a conducive learning environment as one that is active, provides ongoing feedback, challenges learners appropriately, and is able to maintain and sustain learner attention. In addition, they list a series of “must haves” for educational games: (a) conflict or challenge, (b) rules of engagement, (c) goals or outcomes (plus subgoals), (d) continuous feedback, (e) interaction with the environment, (f) compelling storyline. Table 1 below shows how “must haves” were incorporated into the design of the ScavengAR Hunt.

The ScavengAR Hunt follows the Evidence-Centered Design model, which originated from Messick (1994). Evidence-Centered game design seeks to elicit evidence from its participants, showing a degree of competency or skills. It also emphasizes the importance of establishing principled interpretations of the evidence so the competencies or skills are assessed appropriately.

The ScavengAR Hunt uses the ECD action model to obtain evidence from pre-service teachers using mobile devices and applications. The action model can be described as a sequence of actions and what constitutes success of those actions (Schute, Rieber, & Van Eck 2012 p. 328). Groups of four or five

*Table 1. “Must have” educational game elements in ScavengAR Hunt (Shute, Rieber & Van Eck, 2012)*

“Must Have”	ScavengAR Hunt
Conflict or challenge	Usage of mobile devices and applications is monitored and assessed through submission of Twitter posts and Google Form submissions while the groups are on campus completing the activity. Completion is determined when pre-service teachers submit the Case File, an artifact the pre-services create over the course of the activity, to the instructor. Pre-service teachers must complete the activity within 90 minutes.
Rules of engagement	Groups are provided written instructions and tasks to complete at four separate on-campus locations. The Case File confirms whether the group members followed instructions and completed their tasks.
Goals or outcomes	Each group member uses mobile devices and mobile applications to complete a series of specific tasks. All members must complete their tasks at each location for the group to succeed in completing the activity. Instructor can provide feedback to the group remotely, while group members are expected to collaborate and assist each other to complete group tasks.
Continuous feedback	Instructor can communicate with group via Twitter, providing feedback based on posts and Google Form submissions as the groups complete their assigned tasks. Instructor has access to solutions to provide feedback on task completion, potential technology issues, and deviating from the correct location.
Interaction with the environment	Augmented reality mobile applications allows for technology-based interaction. Pre-service teachers must complete tasks at four separate physical locations across campus.
Compelling storyline	Groups follow a narrative based on works of art used as triggers for the augmented reality mobile applications. The story also forces the group to solve a crime using the criteria of the board game Clue© by identifying a suspect, weapon, and location.

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