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Beyond the Campus Walking Tour

An ARIS Augmented Learning Expedition

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Abstract

We present an in-progress project for an Augmented Reality Game for young students visiting a university campus. The purpose of this game is to create an engaging experience for visiting high school students and others to learn about the culture of the university, to involve them as members in the university as a community of practice, and to help students make connections to the university through CrossActionSpaces. We discuss combining the augmented reality features of ARIS gaming platform with the Meaningful Learning with technology framework to achieve this goal.

Introduction

University campus tours often involve a tour guide walking backwards and pointing out the history of campus to prospective students. Some universities also offer online tours. We reconceived the university tour not only as a 'lecture' but as a Learning Expedition in the digital age (Jahnke & Norberg, 2013). We develop a university tour for students that combines elements of both an in person tour and a digital tour using the principles of Augmented Reality Gaming. The project goal is make the tour more meaningful to students in terms of becoming community members. We call it an Augmented Learning Expedition.

Theoretical Framework

The theoretical approaches that guide our design are threefold—the university as a community of practice (Wenger et al., 2002), the university as CrossActionSpaces (Jahnke, 2016), and meaningful learning with technology (Howland, Jonassen & Marra, 2012). First, we envision the campus tour as a learning process. Learning in this situation is not related to traditional lines of subjects and knowing; rather it blends into the process in which new students become part of the university community. By being situated and engaged in the community of practice (Lave & Wenger, 1991), students "interact, learn together, build relationships, and in the process develop a sense of belonging and mutual commitment" (Wenger et al., 2002, p.34). Our Augmented Learning Expedition incorporates the five elements of situated learning a) shared resources and artifacts, b) history, c) language, (e.g., technical terms) d) roles and responsibilities, and e) the social practice as interaction (Lave & Wenger, 1991).

Second, we assume that learning does not take place solely offline or purely online. We are living in a dualistic online-offline infosphere (Floridi, 2014), and therefore interaction turns to crossactions within and across communication spaces (Jahnke, 2016). We use augmented reality to bridge these online-offline communication spaces. Finally, we incorporate the affordances of Meaningful Learning with technology as proposed by Howland, Jonassen & Marra (2012) to guide the design of our Campus Learning Expedition (see Figure 1).
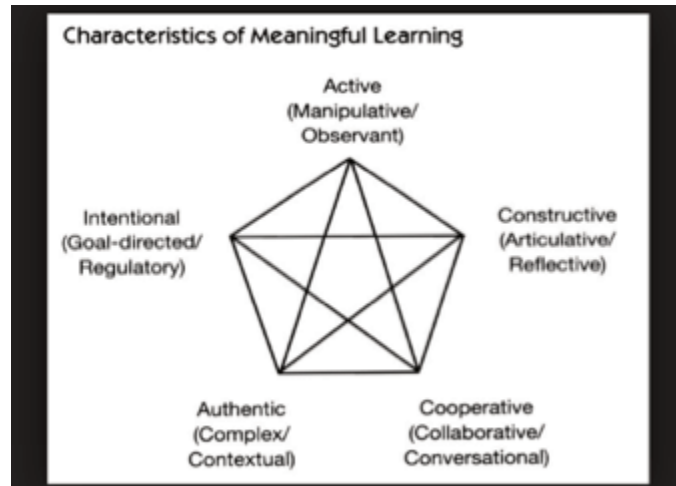

Figure 1: The five affordances of Meaningful Learning with technology (Howland et al., 2012).

Selecting the ARIS Platform

Explorations with Google Glass and ReconNET Jet wearables revealed limitations with screen resolution, time to become familiar with the wearable interface, and need to write game software for those devices. These constraints eliminated wearables and we turned to designing for handheld technologies. The open-source ARIS platform (http://arisgames.org/) met all of our criteria and its features align well with Meaningful Learning (see Table 1) and our other theoretical frameworks.

ARIS Game Features	Active (Manipulative/ Observant)	Constructive (Articulative/ Reflective)	Cooperative (Collaborative/ Conversational)	Authentic (Complex/ Contextual)	Intentional (Goal-Directed/ Regulatory)
Plaque	User selects plaque to view			Context information	Game goal information
Conversations	Choices in conversations		Conversation with a university character	Context information	Game goal information
Notebook	Gather notes, photos, audio or video	Record reflections, tag items	Comment on other player's notebook entries	Location	Record game progress towards game goal
Groups			Players work together as a group		
Items	Pick up items from map		Share items with other players	Items related to context	Track items collected for goal

Table 1. Alignment of ARIS game features and the five elements of Meaningful Learning

Design, Testing and Analysis

Step 1 of the design involved brainstorming five elements of situated learning: a) shared resources and

artifacts, b) history c) language d) roles and responsibilities, and e) the social practice as interaction. We used a brainwriting method to create game scenarios for each of the seven locations that included five elements of situated learning. Step 2 generated rapid paper prototypes. For Step 3, we held a workshop to learn ARIS Editor and turn the paper prototypes into scenes in our ARIS Augmented Learning Expedition.

Our ongoing project employs an iterative design-test-modify approach to assess the effectiveness of our Augmented Learning Expedition. The main goal of the usability testing is to create a user friendly game-based learning expedition for the prospective students. Our iterative usability testing will reveal design issues and user interface problems as well as collect user feedback. The revised expedition will be released once usability problems are fixed and all game expectations are met. One project takes place in July with 120 students simultaneously through the Campus Learning Expedition and in September 2016 with 40 students.

Our research questions include:

> 1. How do the five elements of community of practice (Lave and Wenger, 1991) and five characteristics of Meaningful Learning (Howland, Jonassen and Marra, 2012) in the Augmented Learning Expedition affect student engagement and connection to the university?

> 2. How do transitions between the physical world and virtual world of the ARIS game affect user flow experience toward CrossActionSpaces?

Our preliminary analysis will be based on user surveys, interviews, usability testing results, field observations and ARIS game logs. In our final paper, we will report the preliminary analysis results. We use this data to further refine the Augmented Learning Expedition and to create additional campus expeditions focusing on STEM subjects.

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