

# The Practical Accomplishment of Location-Based Game-Play: Design and Analysis of Mobile Collaborative Gaming

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## ABSTRACT

*Location-based games are believed to be one promising way to exploit the educational potential of mobile technology. In such games, the physical and cultural surroundings become an integrate part of a game space and provide a way to tie content to a game activity and create immersive learning experiences. To explore the properties of such games, and how they are played out in practice we have designed, deployed and analysed a location-based game for learning history embedded in a pedagogical scenario based on collaborative mobile learning. In the video-based, detailed analysis of actual game-play, we study the practical accomplishment of a collaborative gaming activity with mobile technology. In focus are how the participants make use of the resources available in the game space and how these resources, including the historical narrative, feature in the participants' practical accomplishment of the game. In the analysis we identify a number of implications for design of location-based games.*

*Keywords: Collaborative Gaming, Design Ethnography, Game Authoring Tools, Mobile Computing, Ubiquitous Computing*

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## INTRODUCTION

According to Dourish and Bell (2011) mobility has from the very beginning been an intrinsic part of ubiquitous computing. They further stress that we should move beyond the mere “technical and instrumental account of mobility ...” and

“...explore the social and cultural aspects of mobility” (p.118). This paper aims to explore just such properties.

It is argued that mobile technology and handheld devices provide pedagogical and educational potential, which through careful integration in learning activities can have a

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positive impact by making learning more fun, motivating and tied to authentic settings (e.g., Rochelle & Pea, 2002; Klopfer & Squire, 2008). Location-based games are one promising way of exploiting the potentials of mobile technologies for educational purposes (Kurti, Milrad & Spikol, 2007), but it is necessary to find smart ways of utilizing them to create meaningful interactions with content matter, and to find out how they can be integrated into educational activities in schools or higher education (Wake & Wasson, 2011). Furthermore, if we are to understand the use of such technologies and their applications in practice, we need to focus on the design of the learning activities, how they are interactionally organised, and which competencies the participants draw upon to practically accomplish such games.

A number of authoring tools for location-based games are currently being made available (see e.g., Klopfer, 2011), making the creation of location-based games more accessible to practitioners in education. This makes it important to understand both the process of designing such games, and how they are actually played.

In this paper we take a design perspective on mobile, location-based gaming, using the analytical commitments of Design Ethnography (Crabtree, Sherwood & Tolmie, 2012). The paper presents a study aimed at gaining further insight into the interactional organisation and practical accomplishment of collaborative game-play. A location-based game for learning history has been designed and deployed in a pedagogical scenario based on collaborative mobile learning, and we have videotaped students playing the game. The analysis focuses on how the participants used resources available to them in the game space: the game itself on the GPS-enabled mobile phone, and the urban environment and physical surroundings. Playing the game involves moving around in a city landscape and the focus of the study is on how the participants make the resources available for each other, and how they engage with the material presented in the game instructions. This includes how the participants relate to the historical narrative presented in the game,

in and through their interaction, and how this is seen in relation to the historical aspects of actual locations and surroundings. While much of the game-play comprises mundane, everyday activities such as way finding and orientation in the urban environment, it is of interest to understand how these activities are interactionally accomplished and how the resources and their knowledge of the local geography feature in the activity. The presented analysis of game-play is part of a larger project of iterative game design and the on-going work with creating a game-authoring tool. Thus the analysis in this study informs the further design of the game and the authoring tool. We also aim to contribute general insights into how games are designed and played, including the use and design of authoring tools for location-based games. The design ethnography thus needs to span the levels of concrete user experiences, technologies and design activities.

## MOBILE LEARNING AND LOCATION-BASED GAMES

The use of mobile technology to support learning has been discussed for a decade (e.g., Sharples, 2000; Roschelle & Pea 2002). Tools have been developed and studied, both to support collaboration in the classroom (White, 2006), and to provide support when moving into the field (Tan, Liu & Chang, 2007). Rogers and Price (2008) discuss how mobile technology can be used to support collaborative inquiry in the field, and explore how mobile learning is played out in situ. They argue that contextually-relevant information provided by mobile devices can play an important role in facilitating learning, given that it is aligned with previous knowledge and “ongoing observations and actions in the physical environment” (p. 210). In more general terms Klopfer and Squire (2008) propose five different educational properties of mobile technology and handheld applications (p. 204, italics in original): *portability*, *social interactivity*, *context sensitivity*, *connectivity* and *individuality*. Such educational properties

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