

MOBILITY IN LEARNING: MEANING MAKING ACROSS CLASSROOM AND MUSEUM SETTINGS

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ABSTRACT

In this paper I present the design rationale for a work-in-progress mobile learning project titled *Gidder: Groups in Digital Dialogue*. The design challenge is to support upper secondary school students as they collaboratively interpret artworks across classroom and museum settings using a combination of wiki and mobile phone technologies.

KEYWORDS

Mobile, museum, wiki, meaning making, school, art

1. INTRODUCTION

Art studies in Norwegian upper secondary schools focus on the creative and technical aspects of art production. In addition, students are generally required to not only master art history terminology and knowledge about older works but also to develop critical inquiry skills in interpreting works of contemporary art. The premise is that disciplinary knowledge and critical thinking will encourage engagement and richen experience in encounters with art. Hence the name of the project *Gidder* that is presented in this paper. *Gidder* is a Norwegian word that in this context may be translated as 'engagement.'

Art history classes in school, along with guided tours on art museum field trips, are the main educational settings for teaching students how to critically engage and participate in contemporary art discourses. Different resources are available as mediating tools in these respective settings, what Wertsch (1991) calls the 'cultural tool kit' that characterizes a sociocultural setting. In the classroom these include, among other resources, the teacher, power point or overhead lectures, slides, textbooks, and the Internet. In preparation for a museum visit, 'pre-visit' packets with information, worksheets, and good quality reproductions are often supplied to teachers by museums or are available for download on the museum website. On the museum fieldtrip, artworks but also worksheets, the exhibition, curatorial narratives, the architecture, verbal and physical interactions with other visitors, wall texts, brochures, catalogues, and audio and multimedia tours are tools that mediate meaning making. Based on previous research, worksheets are a controversial but significant artefact for students on field trips in museums. Controversial because they direct attention away from museum objects, significant because they frames students' looking in an institutionalized learning activity. Worksheets are also designed for post-visit activity back in the classroom, although these are less frequently used (Falk and Balling 1979; Falk and Dierking 1997; Griffin 2004; Xanthoudaki 1998).

In the *Gidder* research project, technologies and their use will be designed to support meaning making activity in encounters with art, without the use of worksheets. The design is based on the pre and post visit approach described above, which museums endorse in their education programs for school. However, the main focus of the research project is on users and mobile learning. How are technologies, but also other mediating tools, made relevant in meaning making processes? Specifically, how do social software and mobile technologies foster students' collaborative efforts to create knowledge as they interpret artworks moving between classroom and museum settings?

2. DESIGN RATIONALE

The design rationale for *Gidder* is theory-based (2006), anchored in a sociocultural perspective on learning and drawing on mobile technology research that emphasizes the significance of conversation in learning processes (Laurillard 2002; Sharples 2006). Perspectives on mobile learning are combined with recent research on museum learning, specifically, sociocultural perspectives on museum learning conversations (Ellenbogen 2002; Leinhardt et al. 2002; Leinhardt and Knutson 2004).

In sociocultural perspectives, processes of participating, negotiating, and interacting in cultural and social practices are viewed as fundamental to the development of human cognition (Engeström 1987; Vygotsky 1978). Learners first participate in their surroundings, and semiotic, cultural 'tools' such as language mediate their actions (Wertsch 1991). Through ongoing participation and negotiation in specific contexts, humans master, appropriate, and 'disappropriate' cultural tools and their meanings (Polman 2004; Wertsch 2002). Therefore, the guiding design principle for *Gidder* is that cultural tools that support learning, particularly language, are entrenched in existing practices. This means that it is necessary to identify conditions that structure learning settings as well as the activities and interactions that these support.

2.1 Participants and activities

A class of fifteen students (16-17 years old) and their teacher will participate in the *Gidder* pilot. The study focuses on upper secondary students (16-17 years old) because they tend to become engaged in contemporary art, and because teenagers are a key user group for developers of new mobile technologies (Pierroux 2005, in press). Moreover, teenagers' familiarity with many forms of digital technology has made contemporary art museums like the Museum of Modern Art (New York) particularly interested in ICT-supported communication as means of targeting this visitor group (Schwartz and Burnette 2004). A curator from Astrup Fearnley Museum, a leading contemporary art museum in Oslo, is also participating in the *Gidder* project.

All of the participants are involved in the design of the pilot, which is planned for fall 2007. Observations of classroom and field trip activity have been conducted, and video recordings were made for purposes of interaction analysis (Jordan and Henderson 1995). Following field observations, a workshop was conducted at InterMedia's lab facilities with six students from the class, the teacher, and the curator. Here, classroom and museum scenarios were designed, including prototypes of the wiki and mobile phone technologies.

Based on these preliminary research activities, and informed by the theoretical perspective described above, the design of the pilot is currently being planned along the following lines. Each student will be provided with a mobile phone several weeks in advance of the museum visit, and receive instruction about its functions in order to foster a sense of ownership, or appropriation (2006). In the classroom, students will work in a wiki that has been designed for the pre-visit activity. The activity will entail working in groups of two and three to select and interpret artworks on exhibit at the museum that they will visit the following week. On the museum field trip the following week, the students will use their mobile phones to access the class wiki. Based on encounters with authentic works of art, and on interactions with the curator guide, the students may upload and tag pictures, video and sound files, write keywords and add notes to a shared blog. The concept for the technology design for the museum activity is to support - and not distract from - meaning making and interactions with museum objects, other museum visitors, and the physical space. Lastly, in their post-visit classroom work, students will continue to work in the wiki to develop, add, or change their interpretations, and present their collections to the class and teacher. In the following, I describe the concepts for the technology design in greater detail.

2.2 Designing social software for educational use

Wiki technology is important to the design of the project because it coincides with a sociocultural perspective on meaning making as an evolving, dialogical and collaborative process. Based on early research of wikis in educational settings, and on findings from the scenarios, this social software appears to hold genuine

collaborative potential (Lund and Smørdal 2006). There is potential in the sense of the activities it affords, specifically to author and publish jointly produced information resources and texts. In the architecture of newer software such as *Xwiki*, this potential is also found in the scripting framework that makes it possible to add and change features, versions, and functions in the wiki.

In addition to these affordances, design research on the educational use of wikis has identified some important tensions and constraints. First, there are epistemological tensions that emerge at the institutional level, in that established practices in schools emphasizing individual authorship conflict with the wiki's transparent writing environment that rejects ownership (Augar et al. 2004; Lund and Smørdal 2006). Similarly, there are tensions between the very open character of social software and the need for task structures that specifically bring teacher participation and the knowledge domain, art history, into the learning activity. Tensions arise when design interventions are too open and directed mainly at scaffolding student production, as they are often insufficient to support collaborative knowledge advancement (Bruns and Humphreys 2005; Lund and Smørdal 2006; Rasmussen et al. 2003) Therefore the wiki design for *Gidder* will draw on research and features in Computer Supported Collaborative Learning (CSCL) environments (Scardamalia and Bereiter 1991), and on museum learning research (Abu-Shumays and Leinhardt 2000; Ash et al. 2002; Leinhardt et al. 2002; Pierroux in press) to develop meta-level functions like activity maps, teacher/curator spaces, prompts and categories that will facilitate reflection, argumentation, and critical thinking among the students as they analyze and interpret artworks. Furthermore, points of integration in the students' learning trajectory, or 'recapping,' are planned in the design.

2.3 Designing for mobility in learning

The use of mobile phones is important to the design of the project because it supports an understanding of learners - and not just technology - as mobile (Sharples 2006; Sariola et al. 2001). On the museum field trip the following week, students will use their mobile phones to access the Internet and the class wiki to develop, add, or change their interpretations. There will be a difference of course in that the physical artworks will be directly accessible to the students and their meaning making. Furthermore, although the project is not 'dependent' on digital content provided by the museum, some audio and video material is accessible to visitors in the gallery spaces that can be recorded and uploaded into the wiki. Based on findings from the scenarios, features will be designed in the wiki that allow the students to capture and note impressions of a more immediate character in the museum, to avoid the problem of technologies disrupting natural interactions and distracting from the authenticity of the setting and artifacts (vom Lehn and Heath 2003). Blog features will be incorporated in the wiki, for example, to support the use of tagging and keywords, uploading of pictures and video, and note taking. In the wiki, these sequential blog entries will be available for all of the students to read and comment, with a mapping feature that denotes the most frequently used keywords for different works of art. The combination of technologies and the structure of the tasks are designed to support collaborative writing and meaning making process across the different settings.

The student groups will use different types of smartphones, with multiple but also certain prominent features, such as a high-quality video camera or a larger keyboard. A small program will be written in the phones to support scripts and enable the students to write and edit the wiki pages. As with the wiki design, attention will be paid to designing the mobile interface for microgenetic interactions that enable individual and collective participation, task coordination and synchronization, and communication (McGreen and Arnedillo Sánchez 2005).

3. METHODS AND PRELIMINARY RESULTS

The sociocultural perspective that informs the design rationale for this study has been described above. What are the methodological implications of this approach for studies of mobility in learning? Drawing on ethnographic methods, sociocultural perspectives provide insight into different strands of genetic development, that is, processes of change and transformation at microgenetic, ontogenetic and sociogenetic levels. Recent sociocultural studies in museum learning research have found, for example, that similar

discursive structures and strategies are used by teachers *and* curators (Pierroux 2005, in press), challenging analytical distinctions between schools and museums as formal and informal learning settings, respectively. In relation to mobile learning research, sociocultural perspectives correspond with an emphasis on careful studies of context and educational situations in order to design technologies that will facilitate collaborative practices and knowledge creation across settings (2006; Arvanitis 2005; McGreen and Arnedillo Sánchez 2005; Sharples et al. 2002).

However, as stressed above, it is important to be clear about how the relationship between social interaction and learning processes is conceptualized. The significance of social interaction for learning processes is widely acknowledged in the mobile design research (Aoki and Woodruff 2005; Farkas et al. 2006; Hsi 2002) and corresponds with sociocultural perspectives in museum learning and education research in general. However, as Arnseth & Ludvigesen (2006) point out, design research tends to focus analytically on "describing systemic relations between forms of social interaction, and specific types of support or other contextual factors on the one hand, and qualities of outcome on the other" (p. 170). A sociocultural perspective entails a fundamentally different analytical approach; knowledge develops in mediated human activity, of which social interaction – and technologies - are part. In other words, as Rennie & Johnston (2004) put it, things just don't happen in a context, the context is part of what is happening.

This is the framework for analyzing meaning making activity using social software and mobile phones that is planned for the *Gidder* pilot. In other words, although a sociocultural perspective informs all phases of the design process, a distinction is made between the design rationale and the analysis of 'mobile learning.' For purposes of design, interactional data has been gathered in the form of video recordings, with particular analytical attention paid to the classroom's physical and social organization, the structure of the assigned tasks, and the use of tools in the students' different activities. These observations informed the development of a scenario in which students, teacher and curator and researchers participated. Findings from the scenario and observations, in turn, inform the design of the pilot.

In the pilot, there will be an analytic shift in order to focus on the users, that is, students' meaning making across classroom and museum settings. This means that interactions, discourse, and gestures are primary empirical data - not external factors. By focusing on human activity as the unit of analysis it is possible to understand how technologies and other cultural resources are made relevant in the specific settings. It is anticipated that by studying mobility *in* learning we may come closer to understanding the significance of mobile technologies *for* learning.

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