
The Digital Burial Mound: A CHAT Approach to the Design of Teen's Technology

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Abstract

We propose a Cultural-Historical Activity Theory approach (CHAT) approach to the design of teenagers' technology. We exemplify the approach by studying a cultural heritage installation, the Digital Burial Mound designed for engaging teenagers in heritage matters.

Author Keywords

Teenagers; Cultural-Historical Activity Theory; Participatory Design, Cultural Heritage; Interaction Design.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

In 2010 our design team was commissioned to design an interactive installation for an archaeology-museum exhibition in Denmark. The exhibit, targeted particularly toward teenagers, would have to explore the life and death of an 18-year-old prosperous female bog body (a Bronze Age mummified corpse), whose life and early death is a mystery even today. We ended up designing the Digital Burial Mound, in which museum guests could act as

Fig 1. The Digital Burial Mound at Haderslev museum 2011.



archaeologists and unearth digital representations of relics from a representational bog find, investigating the mystery of the young woman's destiny. Beside from being a museum installation, the digital burial mound was also an investigation of teenagers' motivation for engaging in matters of cultural heritage. We addressed the design challenge by studying developmental psychology and especially Cultural-Historical Activity Theory to inform us about teenagers' motives and motivation. Below we will briefly introduce CHAT theory to propose how theory can help us understand teenagers and thereby inform the design of teenagers' technology.

Cultural Historical Activity Theory

Cultural Historical Activity Theory derived from developmental psychology and roots in the work of

Vygotsky (1987) and Leontjev (1978). According to CHAT, personal development takes place through participation in social practices and is dependent on the condition of these practices given for a person's specific activities. Broadly speaking, CHAT provides a highly contextualized understanding of children's development. CHAT has previously been introduced to Child-Computer interaction (CCI) as a general approach to childhood Iversen & Brodersen (2008). A thorough account of an Vygotskian approach to CCI is accounted for in Hourcade's seminal work on Interaction Design and Children (2008).

Motives and Motivation

Depending on the work of Vygotsky, Hedegaard (1995) distinguishes between children's motivation and motives. According to Hedegaard, motivation is the dynamics that



Fig 2. Having unearthed digital objects in the sand, the teenagers get to make their own story about the bog find.

characterizes a person's actions and relationship to the surroundings in a particular situation. For the person, motivation characterizes the dynamic of her situated activities. When returning home from a visit at the archeology museum, the teen can be motivated to actively retrieve background information to know more about the life in Bronze Age. However, the motivation as such is prompted by their recent experiences at the memorial and will almost inevitable decline unless they are re-engaged in other motivating situations. From a CHAT perspective motivation is highly situated and occurs in the intersection between the museum installation and the teenager. Motivation in itself cannot fuel an enduring engagement with the subject matter through time. Enduring engagement is a quality that is closely related to what Hedegaard denotes as motives. Motives are as opposed to motivation the goals, which characterize the actions of a person in different activities over an extended period of time (Hedegaard 2002). Visiting a World War II memorial as a descendant of veterans, with a master degree in history, or in some other way with underlying motives for engaging in the experience of the memorial, the would be able to get a more profound take-away or an enduring engagement with the subject matter. In our case, this personal motive for engaging teens with the bug find from the Bronze Age was rather challenging. They subject matter is simply too distant to the teenagers everyday life. However, looking into the theory, we discovered other approaches to motives that eventually coursed the design of the Digital Burial Mound.

Motives are, according to Hedegaard (2002), structured in a hierarchy of leading, meaningful and stimulating motives. The leading motives of a child originate from the child's central and important activities (Leontjev 1978). Fleer et al. (2009) identify several successive dominating motives

in western societies: the motive of the infant is contact with caregivers. The toddler's dominating motive is exploration of the surroundings. The preschool child's main motive is play and during the first years of school, this motive is gradually replaced by the motive of learning. When the child reaches their teens, the leading motive is the acceptance from friends (Fleer et al. 2009) and "to become someone of consequence" (Hedegaard, 2002). Leading motives are always meaningful, but a range of other meaningful motives can be present without being leading. As an example, teenagers will still have 'learning' and 'play' as meaningful motives, regardless that their leading motive is social acceptance. The 'learning' and 'play' motives are, however subordinated to the leading motive of social acceptance (Hedegaard & Chaklin, 2005). Finally, Hedegaard (2002) identifies stimulating motives as a third category of motives. Stimulating motives are a particular category of motives that in certain activities are meaningful motives. However, these motives loose their activity as an attempt to motivate this particular activity.

A Digital Burial Mound

Our analysis of teenagers' hierarchy of motives impacted our response to the design brief at the archeology museum. Here we will provide two examples: As 'acceptance from friends' is the leading motive of this age group, the collaboration between the teenagers at the museum was brought to our attention. We wanted to investigate how knowledge would appear from conversations among the teens. Moreover, The idea of combining play and learning into the installation (as meaningful motives) provided us with the idea of a 'crime scene' setup. Making the teenagers unearth (digital) objects themselves would be both playful and prompt reflections on how the object would relate to the bog find. It was our hope that this reflection might prompt learning.



Fig 3. The teenagers can print their story to bring home.

The use of mobile devices in the installation was abandoned due to the theoretical understanding of Teens' motives. A mobile phone application introduced to a museum activity would possibly be considered as something taken from another activity and introduced into the museum to stimulate the teens to engage with the installation.

We ended up designed a 2x3-meter custom-made table with a 10-centimeter-deep surface of fine sand; The table was decorated with stones to connote a burial mound. Accessible from four sides, it allows multiple users to interact with the installation simultaneously. Different authentic archaeological digging devices are available on the table to encourage audiences to participate in unearthing the burial mound. When a museum guest stumbles upon a spot in the sand in which a digital object, such as an earring, a comb, or a belt buckle from the bog body is located, a projection of the entire bog body appears for a few seconds on the sand's surface. The object that was unearthed is highlighted in relation to the bog body, providing some hints to the sand surface to an LED display placed in front of the burial mound. Here, the visitor is encouraged to choose among three stories relating to the bog find: One is narrative and proposes how the object might have been significant in the young woman's life; one is related to more general aspects of the Bronze Age; and one is about the properties of the object itself. By choosing among the stories related to the different objects unearthed in the burial mound, visitors create a unique story, mixing facts and narrative, that can be printed out for further investigation and discussion. A thorough account of the digital burial mound can be found

in Dindler et al (2011).

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