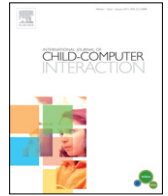




Contents lists available at ScienceDirect

International Journal of Child-Computer Interaction

journal homepage: www.elsevier.com/locate/ijcci

Understanding teenagers' motivation in participatory design

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ARTICLE INFO

Keywords:

Teenagers
Tools of engagement
Participatory design
Motivation
Motives

ABSTRACT

Engaging children in the design of digital technology is one of the core strands in child-computer interaction literature. However, few studies explore how teenagers as a distinct user group are engaged in Participatory Design activities. Based on a case study comprising ten Participatory Design workshops with teenagers (13–15 years old), we identified a range of tools that designers employed in order to engage the teenagers actively in Participatory Design: *rewards, storytelling, identification, collaboration, endorsement, technology, and performance*. Although these tools were realized through the use of well-established Participatory Design methods and techniques, a deeper understanding of teenagers' motivation and motives is essential to understanding how tools and techniques may be made to support teenagers' motivation. We propose a Cultural-Historical Activity Theory approach to teenagers' motives and motivation as a framework for understanding how various tools may be employed to engage teenagers in Participatory Design activities.

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1. Introduction

In the past 20 years there has been a growing concern for children in HCI. This has led to the establishment of child-computer interaction (CCI) as a distinct research discipline, and engaging children in the design of interactive technology is a core issue in CCI. Druin's seminal work on Cooperative Inquiry [1,2] and the Scandinavian approach to Participatory Design (PD) [3–5] have gained wide acceptance as methods for engaging the younger generations in design work. In these studies, and in CCI literature in general, attention is paid primarily to children aged 3–12, whereas older children, the teenagers, are not addressed as a distinct user group. Fitton et al. [6] characterize teenagers not as an age group, but by key traits associated with teenagers. According to Fitton et al. [6], teenagers share a desire for independence, autonomy, association with peers, and a willingness to take risks. Moreover, compared to younger children, teenagers experience an increasing disassociation from parents and guardians [6]. According to Mazzone et al. [7], these distinct traits are also reflected in the way teenagers engage with PD projects. In comparison to younger children, teenagers have low motivation for engagement [7]. Echoing Mazzone, Fitton et al. [6] emphasize the need for more research on teenagers, especially studies of teenagers as *informants* or *design partners*. In this paper, we propose a theoretical

framework for understanding teenagers' motivation. The issue of motivation for participation has always been at the core of PD. In the 1970s, Scandinavian PD began as a result of research projects with workers who analyzed the effects of the introduction of IT at their workplaces [8–11]. Ehn described this as the design of emancipatory practice [8], emphasizing that 'democracy', 'quality of work' and 'skilfulness' are at the core of every PD practice. As Ehn [12] states: "A complementary reason for participation, and in the long run probably the strongest motivation for its use in many organizations, was to ensure that existing skills could be made a resource in the design process" [12, p. 94]. As PD gained wider acceptance outside industrial settings, the political ideals of democracy, quality of work, and skilfulness were maintained [13]. However, the motivation for engaging in PD processes differs significantly between 1970s industrial settings and current, new PD venues, such as schools [5], libraries [14,15], and museums [16].

By analyzing a case study in which teenagers were engaged as design partners, we explore a range of tools available to PD researchers and designers to support teenagers' motivation. We use 'tools' broadly, as both material and immaterial artefacts used in the design process to support teenagers' motivation. The paper is structured as follows: First, we review existing literature on teenagers in PD, and examine how designers currently support teenagers' motivation in PD; second, we provide a theoretical account of teenagers' hierarchy of motives, based on studies in developmental psychology. Based on this theoretical grounding, we analyse a case study of ten PD workshops with teenagers. We propose seven different tools for supporting teenagers' engagement in

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PD: rewards, storytelling, identification, collaboration, endorsement, technology, and performance.

Teenagers as design partners

In popular literature, teenagers are understood as children of the ages spanning 13–19 years. In developmental psychology, teenagers are primarily described by the changes that emerge as a result of developing an individual identity [17]. These changes may be described in terms of cognitive, psychological, and social circumstances, but cultural changes are also likely to affect the teenager's development [17]. In HCI literature, teenagers have so far not been given much attention. In their seminal work on children in HCI, Bruckman and Bandlow [18] describe teenagers' thinking as generally similar to that of adults. They state that designing for teenagers is much less challenging because designers can at least partially rely on their own intuition [18]. Bruckman and Bandlow draw heavily on Piaget's stage theory, which is related to cognitive changes in the human mind from infancy to adolescence. Both Blaye, Ackerman, and Light [19] and Iversen and Brodersen [20] discuss the limitation of building an understanding of children and teenagers solely on cognitive theory. When integrating more socio-cultural aspects of teenagers' lives into the design process, teenagers stand out as a distinct user group. Danielsson and Wiberg [21] argue that the participation of teenagers in design (of educational games) is crucial, as teenagers' values and motivation for using technology are difficult, perhaps even impossible, for designers to predict. Fitton et al. [6] suggest that more research is needed, in terms of actively involving teenagers in research and design projects, especially when it comes to actively involving teenagers in the design process as informants [22] and design partners [23]. Fitton et al.'s [6] definition of teenagers goes beyond age to include social and cultural aspects of transformation from childhood to adolescence, such as the desire for independence and increasing dissociation from parents or guardians. Fitton et al. [6] identify a range of research questions when designing with teenagers, one being, which methods and techniques actively engage teenagers in PD. Having conducted a PD project with teenagers, Marzzone et al. [7] summarize the challenges faced when designing with teenagers as active participants. In spite of their use of well-known PD tools and techniques, they found that teenagers have a short attention span, low motivation, critical behaviour, and unpredictable attendance, in comparison to other design partners in PD projects. Regarding the PD techniques that have been used to engage teenagers through PD, Katterfeldt et al. [24] review a number of existing user-centred design techniques when applied to designing with teenagers. They conclude that teenagers are open for co-design, but that existing techniques need to be further developed [24]. Specific approaches and experiences are also reported in the literature. Edwards, McDonald, and Zhao [25] motivated teenagers to engage in co-design by rewarding them gift certificates worth £100, and Toth et al. [26] engaged teenagers in their project through the use of multiple methods, including the use of diaries. Alvarado [27] describes the Embodied Narratives technique, in which they boosted children's motivation through fun, spontaneous, and open-ended tasks, and Horton et al. [28] introduce a range of teenage personas to engage teenagers in reflections on 'coolness'. Moraveji et al. [29] explore how Comic boarding (as compared to conventional storyboarding) engages teenagers (and children in general) in early-stage design activities. More generally, several authors [4,24,30] point out the fact that ownership and 'expertness' encourage teenagers to commit to the PD process.

Our aim is to explore how various tools may be employed to engage teenagers in PD activities. In the following section we begin by proposing a Cultural-Historical Activity Theory (CHAT) approach' to teenagers' motives and motivation. The purpose of this theoretical framework is to provide the basis for an analysis of various tools for supporting teenagers' motivation in PD Work.

2. Motivation

Our understanding of motivation is derived from CHAT, emphasizing how people's development progresses through their engagement with cultural artefacts and institutions. As cultural values are crystallized in the artefacts and practices of the central institutions of society, and since personal development takes place through participation in these institutions, cultural values become conditions for the individual's development [31]. In particular, we build on studies within CHAT [32,31,33–35] that explore motivation as a relational phenomenon emerging in the transactions between people and cultural institutions. The CHAT perspective corresponds well to existing theoretical understandings of children and teenagers in HCI, as proposed by Blaye, Ackerman, and Light [19], and Iversen and Brodersen [20].

Hedegaard [36] distinguishes between motivation and motives. Motivation may be understood as the dynamic that characterizes a person's engagement in a particular situation. By observing how teenagers tinker with a new iPad application, texting friends or visiting a museum, we can see how their motivation may increase and decrease in particular situations. Whereas motivation is situated and context sensitive, teenagers are driven by more fundamental and cross-situational factors, which Hedegaard et al. [36] term 'motives'. Hedegaard et al. [28] suggest that motives are the goals that shape a person's engagement in particular activities over an extended period of time. Whereas a particular situation or design might attract our attention in a given situation, motives describe more enduring interests and preferences. Motives are developed through people's participation in social and cultural institutions, and thus reflect the values and practices embedded in these institutions, which are appropriated by the individual. Emphasizing the formation of motives as a process of appropriation, El'konin explores how motives are developed through childhood as a function of the central institutions in which the child or teenager participates, such as family, friends, or school [33]. Extending this coupling of motives and institutional engagement, Hedegaard [34] suggests that motives are structured in a hierarchy of meaningful and stimulating motives. At any given time, some meaningful motives will be dominant. The dominant motives are associated with the types of activities that are central and most important to a person's life, reflecting their primary institutional engagement. For pre-schoolers, dominating motives typically revolve around play, and for school children, dominating motives are typically connected to the exploration of roles and being like the adults. For teenagers, dominating motives are typically related to acceptance by peers and being 'someone of consequence'. By being someone of consequence, Hedegaard [33] points out that teenagers are constantly engaged in the process of finding their roles in society, in relation to friends, professions, identity, and in their striving to be successful.

Dominant motives are always meaningful, but a number of other *meaningful* motives may be present without being dominant. As an example, teens may still have motives connected to learning and play that are meaningful, regardless of their dominant motive being social acceptance. A *stimulating* motive is a motive that is meaningful in a different context, but is placed into a new context in which it can motivate the new activity. Stimulating motives are often used in educational contexts to start an activity that is not itself motivating.

This theoretical approach to motives has previously been discussed in interaction design research by Stenild & Iversen [37]. The structuring of motives in a hierarchy means that the dominating motives are superior to other motives, and thus influence how the multi-motivated activities are acted out. As an example, the dominating motive of teenagers (acceptance by peers) is superior to any stimulating motive (e.g. technology usage), and will influence how the teenager engages in technology

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