

# Activity Theory as a Methodology for Assessing Users' Intentions: Design of a Multipurpose Information System to Support Collaborative Youth-Services Work

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**Abstract.** Design of a complex, multipurpose youth-services information system has to engage diverse user groups, including government sponsors, youth-services managers and workers, and their various constituents. Activity theory helps to explain how the intentions and motives of these diverse user groups can be identified and introduced into the system throughout the design cycle, from analysis of a problematic situation through the development, examination, and implementation of a model solution.

The design of computer-based tools to support collaborative work in the social services presents special challenges since the users of these tools include both social-services workers and the populations they seek to serve. Social-services workers have varying degrees of computer access and ability, and their constituent populations have not only varying computer skills but also widely disparate educational levels, socio-economic backgrounds, and information wants and needs. Engeström (1999b) and Foot (2002) describe the cycle of expansive learning as a collaborative process by which participants from a diversity of perspectives question and analyze a problematic current practice; construct,

examine, and implement a model solution to the problem; and evaluate and consolidate the outcomes of the process in new and stable forms of practice. But Engeström and Escalante (1996) observe that such a process can fail if designers are insufficiently attentive to the perspectives of both organizational service providers and the people who use their services. In our work on a youth-services information system, called Connected Kids, we are seeking to capture the diverse perspectives of both organizational users of the system—our government sponsors and youth-services managers and workers—and the populations they serve—including teachers, counselors, and parents and children from diverse educational and socio-economic backgrounds.<sup>1</sup> Our work is complicated by the range and diversity of perspectives on our model of the information system and by the limited ability of non-expert computer users to articulate their information wants and needs. Nonetheless, we believe that activity theory provides a useful methodology for assessing both users' conscious intentions and their sometimes unconscious and poorly articulated motives and needs.

## The Connected Kids Information System

The Connected Kids youth-services information system was initially proposed by the Mayor of the City of Troy, New York, as a computer-based information resource for youth-services organizations, parents, and children. It is currently being developed as a complex, multipurpose Oracle database and World Wide Web interface by computer-science and communication faculty and graduate students at Rensselaer Polytechnic Institute and the University at Albany, with funding from the National Science Foundation and support from the City of Troy, Rensselaer County, and numerous youth-services organizations. System users include government sponsors who will administer the system, youth-services managers and workers (sometimes the same person) who help us to make decisions about system components and contents and who will enter their own and retrieve others' data from the system, and the various constituencies they serve. Our user groups are thus more diverse than the representative groups of workers so often identified in the literature on collaborative design processes (for example, Bødker and Grønbeck, 1991; Bødker and Grønbeck, 1998; Grudin, 1993). To determine the needs of these diverse user groups, we have conducted a series of focus-group meetings to develop system specifications, participatory-design sessions to elicit organizational users' perspectives on the design and operation of the system, and on-site user tests to check the WWW interface. More recently, we have conducted focus-group meetings with parents and children to further refine the system specifications and to explore design possibilities for the WWW interface. In the focus-group meetings, we provided a variety of illustrations or "prompts" to help our users to understand the capabilities and potentials of the system, and, following Krueger's (1994) advice, we enlisted an

experienced focus-group leader to encourage discussion and thus to help participants to discover for themselves what they hope and expect such a system to accomplish for them, their organizations, and their families. We have produced video/audio tapes of these meetings and are currently transcribing the tapes and analyzing the transcripts. In the process, we are discovering expressions of both conscious intentions and unconscious or partially conscious and imperfectly articulated motives and needs, which are further modifying our understanding of the capabilities that we need to build into the system.

## Information-System Support for Collaborative Youth-Services Work

Engeström's (1999b) description of the cycle of expansive learning helps us to situate our work at decisive moments in the collaborative design process, moments of analysis of a problematic current practice or situation and examination of a possible model solution. These decisive moments are, in fact, both interrelated and recurrent throughout the cycle. In our work on the Connected Kids project, we met initially with representatives from youth-services organizations and later with parents and children, with the expectation that the organizational representatives could help us to define the system specifications and that the parents and children could help us to define the WWW interface. In fact, both groups of users helped us with both sets of specifications, with the result that our analysis of the problematic situation and our examination of our model solution have been recurring and expansive throughout the design process. As we reported earlier (Harrison and Zappen, 2003), we had initially envisioned a computer-based system with information about youth-services activities and events deliverable via the WWW. Our organizational representatives, however, identified additional and, for them, more pressing needs—the need to include organizational contact and programmatic as well as event information, for example, and the need to provide WWW presence for smaller organizations and links to currently available WWW resources for larger organizations. Organizational representatives historically had not had regular contact with each other, and they felt a need for more information about other organizations' programs and services, for the purpose of directing their constituent populations to services that they could not provide themselves. Organizational representatives also identified special and, for us, quite unexpected user needs. In subsequent meetings parents and children have also identified aspects of their current practices that suggest additional needs that we could not have anticipated at the outset of the design process. Thus we are led to ask ourselves how we might identify user needs that are implied in their current practices but are frequently unconscious or partially conscious and poorly articulated. We posit some of the

underlying principles of activity theory as a methodology for identifying these needs.

## Information-System Specifications for Diverse User Groups

Mansell (1996) distinguishes *design* as a model or system from *design* as an intention or purpose, and Lievrouw (2002) explains design as “a complex, multilayered process that involves many different groups and their interests.” Activity theory further complicates this notion of *design* by distinguishing intentional actions from motivated activities, experienced at varying levels of consciousness (Leont’ev, 1974; Kuutti, 1996; Engeström, 1999a; Foot 2002). According to Leont’ev (1974), human *activities* are oriented toward *objects* and energized by *motives* and as such are distinct from *actions*, which are directed toward *goals* and guided by conscious *intentions*, and from *operations*, which are dependent upon specific *conditions*. Human motives, experienced at varying levels of consciousness, will never be entirely transparent to researchers. But Engeström and Escalante (1996) point out that even subtle cues, such as “the dilemmatic and hesitant aspects” of participants’ talk, may help to reveal underlying motives, the designers’ love and the users’ hate of a postal-services kiosk, for example, or the designers’ lack of critical awareness of the dilemma created by these love/hate relationships. The transcripts of our meetings with organizational representatives and, especially, with parents and children, illustrate these conscious intentions and unconscious or partially conscious motives and needs.

From organizational representatives, we developed new and unanticipated perspectives on our users’ (conscious and unconscious) needs. A youth-services program manager informed us, for example, that she would like to list activities such as baseball or basketball under different search categories—perhaps “gang prevention” for parents and counselors, “recreation” for children. A police official informed us that we may need to leave Connected Kids brochures in courts and law offices to ensure that parents and children will have ready access to information such as bail-bond or alternative-sentencing information. We are fairly certain that few parents and children are fully conscious of their (potential) need for information of this kind or the strength of their motive to obtain it if and when they need it.

From parents, we learned about the needs and motives of both low-income and more affluent and computer-literate parents. One mother living in a low-income neighborhood informed us, for example, that she regularly rides four buses (more than an hour’s ride each way) after a full day’s work to take her daughter to Girl Scout meetings. But she also told us that she takes her daughter to Girl Scouts as

an alternative to gangs and drugs. We infer that she is only partially conscious of her own motives and needs. Is she really looking for Girl Scouts, or is she looking for any one of a number of constructive activities for young girls? Can we develop a “smart” search function capable of inferring her partially conscious motives and offering her alternatives to meet her real but imperfectly articulated needs? More affluent parents looking for information about summer camps for their children informed us that they are interested not only in what our system can tell them about the camps but also in what other parents might be willing to tell them. Can we provide a bulletin board or chat space where parents can exchange information about summer camps and related activities? Assuming that we can, what will camp administrators think of such a capability? Will they appreciate such a free and open exchange of information about their camps? Will the motives of parents who want the best possible camp experience for their children support or conflict with the motives of camp administrators to fill their camps and pay their bills—motives that they might not be willing to acknowledge, even to themselves?

From middle and high-school children, we learned that children’s needs and motives usually begin with themselves. Thus they want to access information not only about programs and activities but also about themselves, their families, and their friends. Can we devise a mechanism that will permit children to post information, stories, or art work to the WWW directly or perhaps indirectly through their teachers? If so, will school administrators share the children’s motives, or will they—with good reason—have safety and security motives of their own?

We believe that activity theory offers important fundamental principles that encourage us to listen with sympathy to both our diverse users’ explicit and fully conscious intentions and their implicit and only partially conscious motives and needs. We are confident that, in the process, we are learning to design a more fully functional information system for both our organizational users and the populations they serve. Nonetheless, we continue to ask ourselves:

- (1) What are the strengths and limitations of focus group meetings as a method of gathering data about the conscious and unconscious needs and motives of our diverse user groups?
- (2) Once we have gathered this data, what methods of analysis should we use to identify and define our users’ needs and motives?
- (3) Acknowledging the differences between principles and methods, how can we operationalize the basic principles that we derive from activity theory as a rigorous and analytically useful research methodology?

## Note

<sup>1</sup>This material is based upon work supported by the National Science Foundation under Grant No. 0091505. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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