**Chapter 4. Revisiting Activity Theory as a Framework for Designing Student-Centered Learning Environments**

Contributing Authors:
Mumina Abdullah
Sarah Moore
Justin Raisner
Dawn Sevart
Karl Werner

This document presents a summary of the most salient points presented by Jonassen (2000) in Chapter 4 with a focus on providing a better understanding of activity theory and its use in instructional design.

**Describing student-centered learning environments (SCLE)**

Jonassen (2000) states that the key difference between SCLEs and direct instruction is that in SCLEs the problem serves as the central component of the learning activity rather than being used as an example or opportunity to practice concepts. In SCLEs, students learn specific content as it relates to solving the problem. They are encouraged to explore a situation by adjusting variables, experiencing consequences, and using their cognitive, planning, conversational, and collaborative skills to effectively seek solutions.

To aid students in discovering how to solve authentic problems, Jonassen suggests using scenarios. Jonassen views scenarios as opportunities for students to develop real world problem-solving skills and reach conclusions that may or may not have been foreseen by the instructor. In order for learning to occur effectively, the problem in an issue-based learning event should be meaningful to the learners and ill-structured, such that "some aspects of it are emergent. Unless some components of the problem can be defined by the students, they will have no ownership of [the problem] and will be less motivated to solve it" (Jonassen, 2000, p. 91). The problem should also consist of the problem context (the context that surrounds the question and helps define the project), the problem representation (the way the problem is presented to the learners), and the problem manipulation space (the flexibility learners have in testing their hypotheses in simulations). The author then gives an account of two case problems in which aggregate planning was taught in a student-centered learning environment.

**Defining activity theory**

Jonassen moves on from the case studies to a discussion about activity theory and its use as a framework for designing SCLEs. Activity theory is the study of human activity in context. According to Kuutti (as cited in Jonassen, 2000) the theory can be viewed as "a philosophy and cross-disciplinary framework for studying different forms of human activity" (p. 97). Activity theory also derives from Marx's view that learning and activity are interrelated and interdependent. In other words, learning environments that are based on activity theory focus on problems that mimic real-world situations rather than the ideal that is often presented to learners for fear of confusing and intimidating them.

Several assumptions serve as the foundation for activity theory. One assumption is the understanding that there is a unity of consciousness and activity. Unlike Gagnes' work with declarative knowledge, the human mind is incorporated in the activity so the learning and application are a near simultaneous activity and are mutually supportive throughout the process. Another assumption is intentionality. Within the activity theory, learning and doing are inseparable and are to be initiated with intention on behalf of those involved.

Collective human activities are constructions that activity theorist call **activity systems**. These systems cannot be attributed to a single individual within the human collective and are therefore often quite complex. Jonassen adapts an activity systems model from Yrjo Engstrom (1987) that explains the key elements of the system of collective human activity as well as subsystems linking these elements (see model Jonassen, 2000, p.99). Elements of the activity system model are:

- The Subject(s) is the person or people participating in the activity.
- The Object is the product, or end result of the activity, whether it is mental or physical.
- Tools (also seen as "signs" and "mediators") are used by the Subjects in the production of the Object. Tools are specific to a Community and culture of that Community as purported by J.V. Wertsch (1998).
- Outcome is the purpose of the activity (i.e. profit).
- Rules/Customs that affect the activity system are both internal and external constraints.
- Division of Labor is the vertical levels of power and the horizontal cooperating units in an activity system.
- The Subjects make up a Community of social relationships. The Community influences the Subjects, Tools, Rules and Customs, the Division of Labor and the resulting Outcome.
- The Subsystems or processes that grow from and direct the interaction between the main pieces of the activity are Production, Consumption, Exchange, Distribution and Transformation. This model is really a manufacturing model applied to learning.

The model shows us that actions that are used to produce the end product occur within and between these subsystems in a hierarchic manner based on the goals of the activity. Thus, "[a]ctivity is [a] conscious process that consists of chains of actions that consist of chains of operations" (Jonassen 2000 p. 103).

Think of a manufacturing plant to understand this complex model of Activity Theory. The subjects are the workers (machine operators, material handlers, engineers, shipping/receiving personnel, wrappers/packers, quality control manager, etc.) organized in a hierarchical and horizontal structure of division of labor. The subjects work together to produce an object (i.e widget). In order to make these widgets, subjects use tools like CNC machines, computer aided design software, and fork lifts and consume resources like human resources, energy and raw materials. This production is done within the rules of the organization (SOPs, timelines, quality

controls, limitations of the machines) as well as external rules and constraints like ISO9000 certification rules for quality, OHSA rules, and labor laws. There are also historical and cultural rules and norms like tradition, union culture, and old wounds between management and plant workers. If all goes right, the produced object (widget) will be transformed into the outcome which is profit for the manufacturing company.

**How activity theory relates to instructional design**

According to Jonassen, this theory provides a basis that instructional designers can use to arrive at the analysis needed to construct student-centered learning environments. Not only is the external context identified, but also the activity associated with the context, the social context in which the activity occurs, and the tools and rules that govern the activity. Knowing how to use methods of activity systems analysis will lead to the development of rich constructivist learning environments.

However, activity theory emerges through contradictions. These contradictions usually focus around cultural issues and changes. These contradictions are not seen as a negative component, but a sign of the complexity of the problem attempting to be solved. For example, the author relates a case where the activities in a learning environment were set up well. However, there was a disconnect between intended learning results and the actual learning. Students forgot things, seemed unwilling to try to solve problems, and had difficulty applying the skills learned. The author suggests that the contradiction occurred because students were accustomed to environments where "the real object of learning is comprehension and memorization" (Jonassen, 2000, p. 118). Thus, it was difficult to push students to think critically and become better problem-solvers.

Activity theory is primarily a descriptive tool instead of a prescriptive tool. Thus, when creating environments it is important to make sure there is enough time devoted to the study of the problem for it to be accurately solved. Attention should be devoted to the broad patterns of the activity instead of the narrow focused ones and data should be collected in a variety of ways. Other general guidelines are to make sure the intentions of the system are clearly stated; the components of both the systems, subsystems, and subsystem structures are analyzed properly; and ensure that both the contradictions and context are correctly analyzed and represented.

**Reference**

Jonassen, D. H. (2000). Revisiting Activity Theory as a Framework for Designing Student-Centered Learning Environments. In D. H. Jonassen, & S. M. Land, *Theoretical Foundations of Learning Environments* (pp. 89-121). Mahwah, New Jersey, United States: Lawrence Erlbaum Associates, Inc.