

## Chapter 2.16

# Using Activity Theory to Assess the Effectiveness of an Online Learning Community: A Case Study in Remote Collaboration using a 3D Virtual Environment

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### ABSTRACT

Remote, collaborative work practices are increasingly common in a globalised society. Simulating these environments in a pedagogical setting allows students to engage in cross-cultural exchanges encountered in the profession. However, identifying the pedagogical benefits of students collaborating remotely on a single project presents numerous challenges. Activity Theory (AT) provides a means for monitoring and making sense of their activities as individuals and as a collective. AT assists in researching the personal and social construction of students' intersubjective cognitive representations of their own learning activities. Moreover, AT makes the socially constructed cultural scripts

captured in their cross-cultural exchanges analysable. Students' reflection on these scripts and their roles in them helps them better understand the heterogeneity of the cultures encountered. In this chapter Engestrom's (1999) simple AT triangular relationship of activity, action and operation is used to analyze and provide insights into how students cooperate with each other across different cultures in a 3D collaborative virtual environment.

### INTRODUCTION

As part of an ongoing study in online learning communities by the authors, a series of remote collaboration pedagogical exercises have been conducted since 2000. They involve ITC, multimedia, and design computing students from three

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different universities on different continents and in different timezones collaborating on a single project using the online 3D Active Worlds environment, in conjunction with social software such as MSN, Skype and Blogs. This chapter uses the latest iteration of these remote collaboration exercises as its case study for the establishment of a consolidated methodological framework for these types of exercises using Activity Theory (AT). AT provides a methodological framework that situates the individual's contribution within a collective. In this manner it is possible to identify the pedagogical benefits from the exercise at the level of the individual's goals and activities leading to goal attainment, and the individual historically situated within the collective goals and its associated activities.

AT is based on the idea that culturally defined tools, or artifacts, mediate all activities. These tools and artifacts are historically situated within the activities in which they are used. For learning environments, social interaction and the way activity is organized can only be understood from its historical context: learners complete multiple cycles in attaining their goals and those of the collective; create an identity within the learning community; and, trade their cultural capital in the relationship between their actions and socioeconomic structures. However, much of the analyzable data is derived from heuristic methods, thus being open to interpretation. AT helps concretize this otherwise subjective information by providing a structure for its interpretation. It does this by incorporating Leont'ev's (1978, 1981) three-level schema: activity, action and operation; corresponding with: motive, goal and instrumental conditions, and the transformations between these levels. In so doing, the meaning-making object of their endeavors is taken from the surrounding activities they engage in, in their learning practices.

The AT framework outlined here is used to analyse, guide and influence the construction and conducting of the remote collaboration exercises.

It may be useful to others interested in formalizing their own remote 3D collaboration exercises who wish to extract the pedagogical value of these exercises and guide their formation. The AT framework is particularly pertinent to students using online technologies in collaborative exercises, as it assists in the research of personal and social construction of intersubjective cognitive representations in education. Indeed, there is a pressing need for long-term development of thoughtfulness and personal and social identity in an increasingly globalised society. AT makes socially constructed cultural scripts analysable (Hedegaard 1986, 1987, 1990; Bruner, 1986; Wittgenstein, 1953). Graduating students need the cultural tools (Bruner, 1986; Cole, 1990; Wertsch, 1990) to enable them to manage the heterogeneity of the cultures they will encounter in a global work environment.

## **THEORETICAL LINKS AND MOTIVATION**

### **Activity Theory**

Cultural-historical theory of activity, or Activity Theory for short, is based on the work by Vygotski (1978), Leont'ev (1981) and later Engeström (1987). The fundamental unit of analysis is human activity. Activity Theory is based on the idea that culturally defined tools, or artefacts, mediate all activity. Individuals and groups can be seen as situated within the context of larger communities mediated by rules of participation and division of labour. Artifacts are continuously modified and shaped to meet evolving needs. We can use work activity as a basic unit for analyzing cooperative working situations (Kuutti, 1994; Bedny & Meister, 1997). Activity Theory can help us understand the way work activities are cooperatively realized in order to better understand learning communities. Marx (1968) is referred to in AT to demonstrate how, within the concept of activity, social change

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