Congruence and Tension among Activity Systems in a Tripartite Partnership for Systemic Reform

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Abstract: Systemic reform often involves partnerships between multiple communities of practice (CoP). In order to understand the strengths and challenges of a partnership, it is necessary to examine the objectives and practices of the constituent communities and the forces that shape these practices. This paper presents an activity theory analysis of relationships between three CoPs in a systemic reform effort, Hawai`i Networked Learning Communities. Essential tensions between the activity systems of the CoPs are analyzed to understand key issues encountered in the implementation, particularly with respect to the role of technology in mediating systemic reform.

Introduction

Systemic reform—the effort to effect sustainable changes in the functioning of a school system that lead to improved student achievement (Fullan, 2001; Harris, 2005)—is typically undertaken as a partnership among multiple communities of practice (Huffman & Hipp, 2003, Schlager et al., 2004). For example, the systemic reform initiative that is the topic of this paper, Hawai`i Networked Learning Communities (HNLC), is a partnership between a state school system and university researchers. Partners bring not only different strengths to the collaboration but also enact distinct practices under different reward systems and sets of constraints (Hildreth & Kimble, 2004). In order to understand the strengths and challenges of a partnership, it is necessary to examine the objectives and practices of the constituent communities and the forces that shape these practices. Such reflections on a reform process should be an ongoing affair, conducted not only at the outset during the planning process but also during implementation as experience provides an empirical basis for further reflection and identification of problems motivates its urgency.

This paper is the product of ongoing reflection within the HNLC initiative, which is in the fourth year of its implementation. Several theoretical frameworks are being employed. In this paper we report on our use of Activity Theory (Cole & Engeström, 1993; Engeström, 2001) to identify congruences and tensions between the partner communities that help us understand key issues encountered in the implementation of HNLC, particularly with respect to the role of technology in mediating systemic reform (Suthers et al., 2004). This analysis is augmented with the concept of *dualities* from Communities of Practice theory (Wenger, 1998). We write from our point of view as the university partner, and have grounded our claims about the activity systems of other partner communities in qualitative data including surveys of teacher cohorts, focus groups, interviews and other communications, meeting notes, and documents resulting from our joint effort such as strategic plans and reports. As explained below, we view our partnership as a tripartite one between school system staff, teachers, and university researchers. This paper will focus on how activity theory and dualities helped us conceptualize observed tensions that involve the activity systems of all three of these communities.

Background

Hawai`i Networked Learning Communities

Hawai`i Networked Learning Communities (HNLC) is a Rural Systemic Initiative funded by the National Science Foundation. Its goal is to empower educators to prepare students in economically disadvantaged rural schools for life and careers in today's complex and technological world by enabling them to attain high standards in science, mathematics, and technology. The initiative involves a partnership between the Department of Information and Computer Sciences (ICS) at the University of Hawai`i (UH)

and the Advanced Technologies Research Branch (ATRB) of the Hawai`i Department of Education (HDOE). The HDOE is the only statewide school district in the United States. Approximately 40 K-12 schools have participated in HNLC, having joined the initiative in four successive cohorts starting in 2002.

Alongside our other roles as project leaders and facilitators, the UH team provides technology support for the systemic reform effort (Suthers, et al., 2004). Our intent is to support the change process itself, especially as manifest in teacher professional development and the collaborative reflection of practitioners. While ATRB focuses on application of technologies in the classroom as vehicles of instruction or the object of study, we offer information technologies in the form of an interactive web site (hnlc.org) to support collaboration and share resources across institutional and geographic boundaries between isolated rural schools in our island state. This "virtual community center" is designed to support the needs of special purpose groups that are embedded in a statewide virtual community of educators. This nested community approach is intended to capitalize on the advantages of larger groups such as resource sharing and potentials for new interpersonal relationships (Resnick, 2002) while also meeting local needs and enabling negotiability of purpose (Wenger, 1998). Community support includes a membership directory, a database of educational resources particularly relevant to Hawai`i educators, and a community forum for news and announcements. Smaller groups are supported by workspaces that collect together wiki pages, file sharing, and document-centered discussion tools.

The concept of communities of practice (Wenger, 1998) has been central to our initiative. However, the subject of systemic reform—the state school system—is not a unitary community of practice. In HNLC we soon found that the most salient distinction (expressed by participants as well as substantiated by our own observations) is between "the state" and "the schools." "The state" is the statewide administrative system in Honolulu, of which ATRB constitutes one branch. "The schools" are the teachers, principals and other support personnel who work together within schools geographically distributed across the islands. Our systemic reform effort includes a third community of practice, university researchers, forming a tripartite relationship. Although ideally all participants will function as one community (Barab, Schatz & Scheckler, 2004), the current reality is that multiple communities of practice are involved. The functioning of the entity formed of these three communities of practice is influenced by the orientation of each community's practice, its resources, and its constraints; so conceptual tools are needed to understand each partner community in relation to the others.

Theoretical Foundations

Activity theory provides a useful framework within which to understand the primary focus of each community, the resources with which a community replicates its practices, and the influences and tensions generated by the context within which its members work. Originating in Vygotsky's (1978) recognition that cultural artifacts mediate human action, the second generation of activity theory provided conceptual tools to understand cultural-historical resources for and constraints on collective action (Cole & Engeström, 1993; Engeström, 2001). The activity of any subject is directed towards an object in order to achieve some outcome. Object-directed activity may be accomplished directly, or may be mediated by tools, including language and other representational tools as well as physical devices, and by participation in a community, which is organized by rules and division of labor. Mediation is a key concept and can be applied analytically between any three elements of the activity system. For example, the subject's relationship to a community is mediated by rules that enable or constrain the ability to enact his or her role. Problems and the potential for change can be understood in terms of contradictions or tensions within and between elements of the activity system. More recently, a "third generation" of activity theory considers networks of interacting activity systems (Engeström, 2001), the approach taken in this paper.

Like Barab et al. (2004), we find that multiple analytic models are needed. Activity theory provides a structural model within which tensions are to be identified, but additional guidance is needed to analyze these tensions. Our analysis incorporates the dualities of Wenger's (1998) communities of practice (CoP) model. A duality is not a binary variable, nor even a spectrum along which a system has some value. Both elements of the duality are always present and interact both problematically and productively. Wenger (1998) identifies four dimensions that address "the fundamental issues of meaning, time, space, and power," namely: (1) participation and reification, (2) the designed and the emergent, (3) the local and the global, and (4) identification and negotiability. While Wenger uses the concept of dualities to examine the

forces that create and sustain CoPs, we apply this concept to understand forces between as well as within communities.

Three Communities, Three Activity Systems

This section outlines an activity-theoretic characterization of the three major participants in our systemic reform effort. The activity systems are illustrated in Figure 1, along with relationships between them and "emergent activity systems" to be discussed later.

Teachers act as members of a school community. Students are the object of their activity and student learning the outcome (lower right, Figure 1). The artifacts that mediate teachers' student-oriented activity include curricular resources such as unit and lesson plans, instructional media, and technologies. According to our survey and focus group data, tensions within the teachers' activity system that affect the systemic initiative include resource limitations of all types—curricular and technological resources, technical knowledge, experience with collaborative technologies, and time for professional development activities (constrained by the need to hire substitute teachers). During the course of our project, the state content and performance standards were revised twice, creating added challenges for teachers endeavoring to organize their curriculum plans by the standards. The threat of No Child Left Behind sanctions can result in de-prioritization of all activities—including implementation of the place-based inquiry learning advocated by HNLC—other than preparation for standardized tests.

Our systemic reform effort is a collaboration with the Advanced Technologies Research Branch of the state-level Department of Education. ATRB team members who are tasked with HNLC responsibilities direct their activity towards teachers as their object and change in practice as the intended outcome (upper right, Figure 1). ATRB seeks the implementation of assessment-driven, standards-based curricula through activities that engage student interest and participation, in particular, place-based inquiry learning leveraging the environmental, economic, and cultural context and concerns of students. ATRB team members seek to achieve this outcome through professional development (PD). The "mediating artifacts" include plans for PD sessions and the incorporation of available PD materials. Tensions within this activity system affect success at reform efforts. Revisions to the content and performance standards created ambiguity over which version to use in professional development activities before the new version was officially adopted. Budgetary and political pressures result in operational directives that change priorities and constraints (e.g., limiting travel for school visits) or mandate new foci and methods (e.g., curriculum mapping or creating learning communities).

The University of Hawai`i (UH) team, the other systemic reform initiative partner, consists of members of the Laboratory for Interactive Learning Technologies in the Department of Information and Computer Sciences (ICS). The university team's activity system as a research team and associated tensions and constraints are familiar to many readers of this paper (left side, Figure 1) As an actor in the systemic reform effort, the UH team has as its object both the teachers (lower left, Figure 1) and the ATRB team members (upper left, Figure 1). Desired outcomes in both cases are changes in practice, and the primary mediating artifact considered in this paper is the use of hnlc.org to support collaboration and community. With teachers as the object, the UH team shares some of the outcome objectives with ATRB, but additionally has an emphasis on communities of practice. Tensions within this activity system include the competing priorities of project implementation and the need to examine the technological mediation of communities and collaboration, directed towards research findings and publications as outcomes.

Relationships Among Activity Systems

A systemic reform effort involving partners from three distinct communities of practice cannot be fully understood by considering those communities individually. More complex relationships—pair wise and tripartite in this case—must be considered to understand challenges and potential for change (Engeström, 2001). A multi-system analysis is particularly important in systemic reform where one partner introduces tools that are intended to mediate the activity of the other two, as in the present case.

When the members of one community are oriented towards members of another community as their object, we might expect that a new activity system that reflects the relationships between the communities will emerge. The mediational triangles of these *emergent activity systems* are illustrated in

Figure 1, placed between the communities from which they are to be formed and framed in ellipses. For example, the ATRB team's activity system oriented towards teachers is intended to engage teachers in a new system (right ellipse, Figure 1) in which their curricular resources are the objects and professional development is the mediating tool. Similarly, the UH team activity system oriented towards teachers seeks to engage teachers in a new system (lower ellipse, Figure 1) in which they are oriented towards their curricular resources as the object mediated by a community of practitioners using hnlc.org; and UH oriented towards ATRB similarly seeks to engage ATRB staff in facilitating community of reflective practitioners supported by hnlc.org (upper ellipse, Figure 1). In this section we identify both congruences (structural similarities) and tensions between both the primary and emergent activity systems in our partnership.

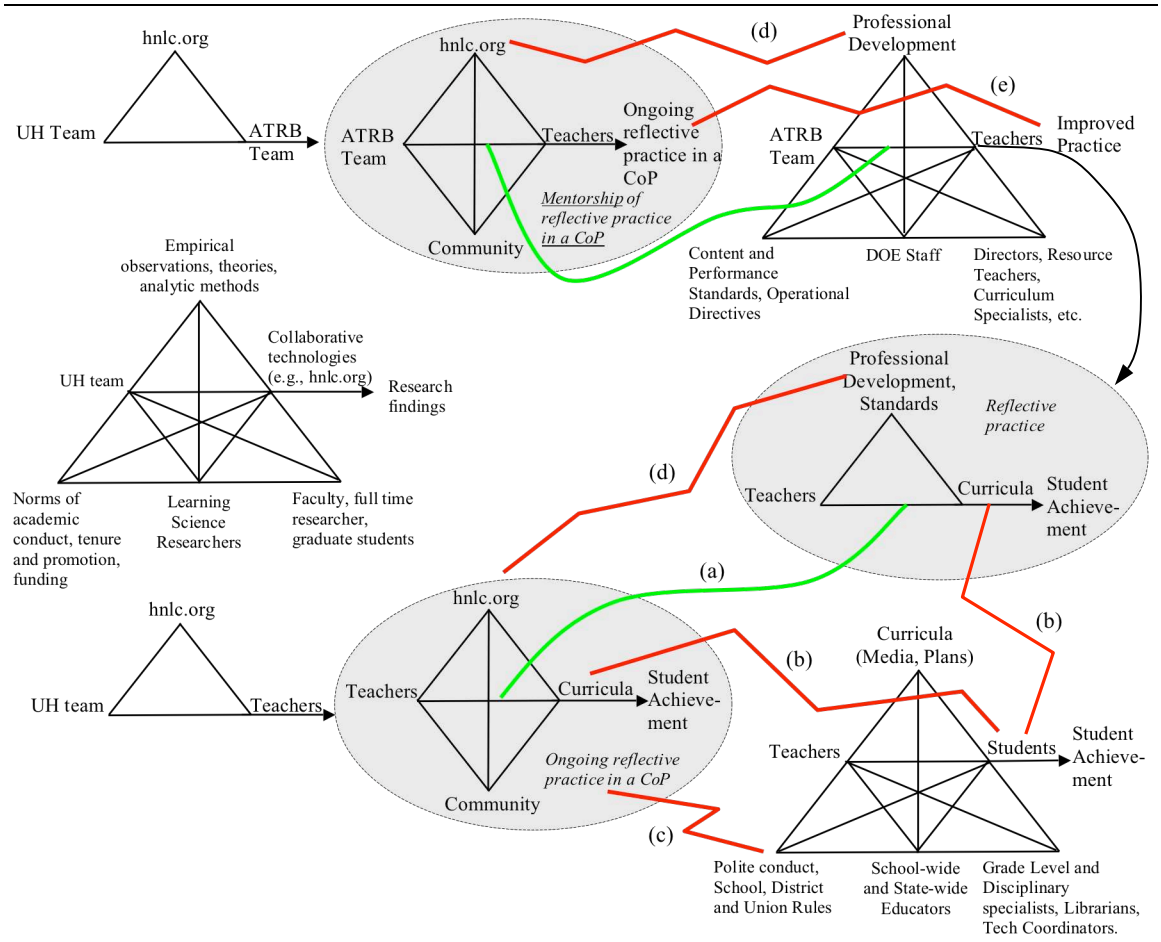

Figure 1. Relationships between three primary activity systems.

(a) Congruence of teacher orientation towards curricula between emergent activity systems fostered by both ATRB's and UH's orientation towards teachers.
(b) Participation/reification tension between teachers' orientation towards students and the orientation towards curricula in the emergent activity systems sought by ATRB and UH.
(c) Cultural and local/global tensions between teachers' norms of noncritical conduct and reflection in a community of practice sought by UH orientation towards teachers.
(d) Mismatch in mediating artifacts emphasized in emergent activity systems sought by ATRB and UH.
(e) Emergent activity system sought by UH places greater emphasis on ATRB's role as mentors of teachers' ongoing reflective practice in a CoP.

Congruence in Reflective Practice

Both the ATRB and UH teams want to help teachers become *reflective practitioners* (Schön, 1983; York-Barr et al., 2001), reflecting on their instructional resources and unit and lesson plans and how they are implemented in the classroom towards the objective of improving student achievement. This common goal is congruent in the emergent activity systems that both ATRB and UH teams seek to create in their orientations towards teachers (curved lines, Figure 1(a)). Teachers' mediating artifacts (curricula) become the objects of inquiry in the activity system of the reflective practitioner.

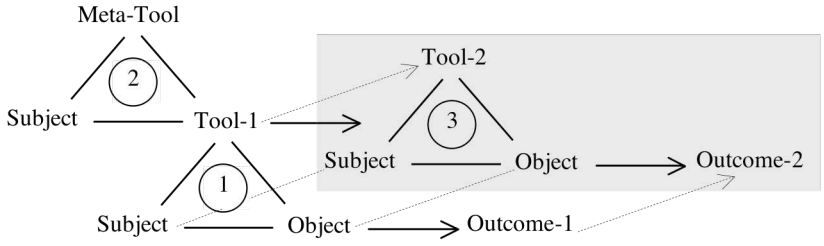

Figure 2. In reflective practice, the tools for the current practice (1) become the object of reflection (2) leading to a revised practice (3).

A schema for reflective practice is shown in Figure 2. Practitioners are engaged in a primary practice indicated by the lower activity system (1). For example, teachers are the Subject, students the Object, and curricular resources and plans are the Tool (Tool-1 at time 1). In the reflection process, the mediating tools of this activity system (Tool-1) become the objects of deliberation, criticism, innovation, and revision (2). Other aspects of the primary practice, such as rules and division of labor, may also be considered and revised; this is omitted from the present paper for simplicity. A meta-tool is employed as the tool by which reflective consideration of the primary tool is accomplished. For example, the meta-tool can be theory, professional development materials and activities, and/or discourse within a community. Tool-1 of the primary activity system is deliberately revised into a new one, Tool-2, in order to improve outcomes. As a result, the primary activity system is transformed into a new activity system using Tool-2 with different (hopefully improved) outcomes (3). The process repeats with this transformed activity system: in an ongoing process of expansive learning (Engeström 2001), reflective practitioners must simultaneously maintain a reflective activity (2) in order to continuously transform practice in the primary activity ($1 \Rightarrow 3$).

Tensions Between Activity Systems

Some tensions may be noted between the emergent activity system (reflective practice) and teachers' primary activity system. In order to engage in the professional development activity, teachers must reify their curriculum planning so that it can become an object of inquiry in itself. This reification can be difficult for those who practice a more spontaneous approach to instruction (jagged lines, Figure 1(b)). For teachers who are not accustomed to critically examining their own practice, the focus on teacher performance (in addition to student performance) is a paradigm shift. In the community version of reflective practice, teachers are asked to share their reified tools with other teachers for co-reflection, which can be threatening in a culture where teachers seldom critique each other (Figure 1(c)). This is one among several factors accounting for the lack of peer commentary on teachers' units in hnlc.org. A local/global tension also complicates the exercise: will the plans teachers developed to fit their situation make sense in other schools and classrooms? This duality also has a top-down manifestation: does the statewide set of standards and other criteria and practices promoted by the professional development program make sense in every teacher's classroom?

We noted that there is congruence between the ATRB and UH teams' intended emergent activity systems for teachers. However, there is also a difference: ATRB focuses on its professional development activities while UH focuses on technology-mediated community in hnlc.org (Figure 1(d)). The need to integrate hnlc.org with ATRB's PD planning has been an ongoing issue in the project. The same tension is evident in a comparison of the UH-oriented-to-ATRB emergent activity system and ATRB's primary

activity system. These tensions between planned professional development and practitioner discourse reflect both designed/emergent and identification/negotiability dualities. In inviting ATRB staff to use hnlc.org, we are attempting to implement a model that equates professional development with ongoing facilitation and mentorship of the reflective practice of members of a community of practice. Although the object of activity in the emergent activity system remains the same (i.e., teachers), we are asking ATRB staff to use a different mediating artifact, the online tools for collaboration and community support, and to orient their activity towards the outcome of an ongoing community of practice (Figure 1(e)).

The use of technology (hnlc.org) in itself is not a challenge for members of an Advanced Technology Research Branch. Difficulties we have encountered are better explained by our assumption of identification with (1) a community of practice model of professional development, and (2) the need to mentor teachers to support such a model. Further negotiation towards consensus on these outcomes is needed, and will impact the role of technology as mediator. In addition to ATRB's orientation toward helping teachers use technology for student learning, technology becomes a mediator for teacher learning. It should be noted that ATRB promotes both reflective practice and learning communities. The issue is what these terms mean to different people, whether the concepts are integrated as reflective practice *in a community of practice*, and the consequent implications for the role of technology. We are presently working with ATRB to negotiate a shared conception of professional development and better integrate our offerings.

Structural Issues in Mediation

Like any school system, the HDOE is a hierarchical system in which system administrators and staff produce reifications of "best practices" for replication—desired practices to be adopted by teacher practitioners. Yet, change in practice is not imposed from outside (Osterman & Kottkamp, 1993). Teachers and HDOE staff need to negotiate a shared object (Engeström, 2001): the practices that are promoted by professional development. In an attempt to support HDOE's efforts towards best practices with a technological artifact, the UH team inadvertently became an intermediary in (and a barrier to) this conversation. The technological artifact is the "unit plan template," a web-based form for describing a unit plan. HDOE professional development staff wanted to guide teachers through an assessment-driven backwards-mapping approach to unit planning (Wiggins & McTighe, 2001), and requested that the unit plan template enforce this process. According to this model, teachers should first identify the content and performance standards to be addressed and then identify the assessment instruments to be used to measure outcomes, before indicating student activities and the materials needed to support these activities. This scripted approach to unit authoring is the opposite of many innovative teachers' approach of identifying an engaging activity first and designing a unit around this activity. While this designed/emergent tension is a significant issue, the greatest problem lies in a failure of negotiability. The web-based unit template was controlled by the UH team, and therefore served to place us in a mediating role between HDOE staff and teachers. HDOE staff requested revisions in the template's structure, while teachers who were using the template expressed frustration with its inflexibility and noted incompatibilities with formats being used in their local school. When the UH team tried to respond to one community, the other sometimes disagreed with the changes. Our role as designers of the artifact intended to mediate between the systemic reform agenda and teachers' practice placed us in the role of mediator of conversations about tensions between this agenda and teachers' practice, conversations that should have taken place directly between HDOE staff and teachers. We realize in retrospect that a better choice would be to provide tools for reification that are accessible to both HDOE staff and teachers, and associate these tools with support for conversation about the reifications. Then teachers and professional development staff could negotiate directly over the timing and content of reifications such as the unit plan template.

Conclusions

Most if not all systemic reform efforts are a partnership between multiple communities. Ideally, they would function as one community, but reality demands that reform leaders examine their practices to find congruences and potential tensions between partners. Activity theory, augmented with concepts of dualities in communities of practice, provided us with tools for this analysis. This approach was applied to understand a tripartite partnership in a systemic reform effort involving staff in a statewide school district, school-based teachers, and us as university researchers. Examination of the corresponding activity systems and the emergent activity systems sought by these partnerships identified congruence in objectives of

reflective practice, along with tensions in the role of technology to support this reflection, individual versus community (collaborative) reflection, and a risk unique to tripartite relationships: that one partner might become intermediate to negotiations that should take place directly between the other two. We are using this information in engaging partners in re-examining goals and strategies. The paper also illustrates a theoretical point: communities of practice are activity systems, and communities and their activity systems are nested. Therefore, concepts developed for analysis of *internal* tensions of communities and their activity systems can also be applied to understanding relationships *between* communities and their activity systems: intra- and inter- are two views on the same relations.

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