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# Appropriating and Negotiating Knowledge: Technologies for a Community of Learners

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Recent developments in technology-based educational interventions grounded in contemporary theories of learning and cognition have shifted toward a situated and social emphasis. In this vein, the notion of a community of learners is gaining momentum. The design of technologies supporting the concept of a community of learners has also been predominant. Jonassen (1995), for example, conceptualized a taxonomy of learning environments supporting such communities. Generally, taxonomies of such nature focus on technologies supporting the process of social construction of knowledge or meaning negotiation.

We argue that within the concept of a community of learners, besides social constructivism or negotiation, there is the important dimension of apprenticeship (Rogoff, 1990) which would also require technological support. In apprenticeship settings, the less knowledgeable acquire knowledge from the more knowledgeable.

The two distinct notions above can be seen as objectives to be achieved within different contexts of a community of learners. The first objective—of social constructivism—can be termed *negotiating* knowledge, whereas the second objective—of apprenticeship—can be referred to as *appropriating* knowledge. In *negotiating* knowledge, the general premise is that the knowledge has yet to be constructed or established,

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whereas in *appropriating* knowledge, the knowledge has more or less been accepted by the community.

Depending on how radical a social constructivist one wishes to be, it may be stated that there is in fact no such thing as *appropriating* knowledge; that is, all "legitimate" knowledge *must* be negotiated. We adopt a different view from such a perspective. We emphasize that knowledge negotiation is a powerful way of learning, but not necessarily the only choice and the most 'optimal' way. For example, learning the numerical sequence, as a basis for understanding further mathematical concepts, cannot be negotiated (1 is followed by 2 and then followed by 3, etc.), but rather learned through rote memorization or appropriation. This is because the number sequence has already been *negotiated*. If a community accepts such a *negotiated* knowledge, there is no basis for negotiation from the perspective of the learner. Learning such knowledge cannot be through social negotiation, but rather through appropriation. In the same vein, through the process of *appropriation*, the assumption is that there is a basis for preset objectives, such as directing the learner to learn the accepted (or negotiated) knowledge, before engaging him or her in the higher levels of negotiation.

Hence, in this article, before proceeding with our discussions, we make two assumptions: (1) that there is a role for instruction wherein students can appropriate knowledge based on stipulated objectives, and (2) that students can engage in the process of knowledge negotiation for developing epistemological dispositions.

## Implications for Instruction

Due to the lack of differentiation between the above two distinct notions or objectives within the contexts of a community of learners, implications for teaching and learning may be inappropriately applied. That is, implications which are more suitable for *appropriating* knowledge may be misapplied for contexts in which the objectives are for *negotiating* knowledge. For example, when educators desire to develop dispositions for thinking among students, they should be adopting approaches to *negotiating* knowledge (i.e., social constructivist approaches) instead of using pre-structured approaches such as teaching expert strategies and heuristics (e.g., providing thinking templates). By so doing, students may be tempted not to question the templates, thus defeating the purpose of developing metacognitive dispositions.

Similarly, the converse of the above example is also commonly observed. When students need to learn negotiated knowledge, they may be led to engage in the negotiation of knowledge that results in explorations which may distract them from the intended objectives. (The word "objectives," of course, is anathema to the more radical social constructivists, we recognize.) For example, when students are asked

to search for specific issues on the World Wide Web, they may gather other 'interesting' information that is not directly relevant and may be distracting to the task at hand. As a result, they may discuss with their classmates issues relating to these distractions. These side-turns may be productive for many situations. However, they do not currently fulfill the intended objectives. This example shows that learning *negotiated* knowledge through the process of negotiation could be problematic.

Based on our understanding, there are at least three situations relating to the successful negotiation of *negotiated* knowledge which are not necessarily linked to the *negotiation* process. The first situation is the presence of the more knowledgeable adult (e.g., the teacher) or peers, who have previously acquired that particular knowledge. The second probable scenario is the presence of resources recording the negotiated knowledge. The third possibility is when the knowledge to be gained is attainable through the students' current ability levels. The first two situations, although commonly referred to as negotiation, actually denote *apprenticeship learning*, whereas only the third scenario describes negotiation more accurately.

However, we recognize that in most situations, the objectives of appropriation and negotiation co-exist. For example, in Brown and Palincsar's (1989) Reciprocal Teaching approach of understanding texts, teachers first model the processes of reading and understanding texts and subsequently engage students in those processes. If the learning objective is twofold, complementary use of strategies for *appropriating* knowledge and *negotiating* knowledge can be used. That is, in situations in which learning is between practitioners and novices (i.e., learning *negotiated* knowledge), *appropriating* knowledge strategies are used, whereas in contexts in which interactions between practitioners and practitioners (or novices to novices), *negotiating* knowledge strategies are applied.

### Analysis Based on Activity Theory

The above distinction of *appropriating* knowledge and *negotiating* knowledge can be further analyzed by activity theory. The basic structure of an activity consists of the (a) intended object to be achieved by (b) subjects involved within the context of a (c) community where work is mediated by (d) tools, (e) rules of the practice, and (f) division of labor (Cole & Engestrom, 1991; Jonassen & Rohrer-Murphy, 1999; Kuutti, 1996). Thus, activity cannot be understood or analyzed outside the context in which it occurs (Suchman, 1987).

In addition, activities are not static or rigid entities; they are under continuous change and development. An activity always contains various artifacts (e.g., instruments, signs, procedures, machines, methods,

laws, forms of work organization) and these artifacts have a mediating role. For example, an instrument mediates between a subject and the object of doing; the object is seen and manipulated within the limitations set by the instrument or tool. Very importantly, an activity is a form of doing directed to an object, and activities are distinguished from each other according to their objects (Jonassen & Rohrer-Murphy, 1999). Based on these tenets of an activity, our analysis is tabulated in Table 1.

**Table 1.** Distinguishing between appropriating and negotiating knowledge.

Object	<i>Appropriating</i> knowledge	<i>Negotiating</i> knowledge
Supporting theory	Zone of Proximal Development	Social constructivism
Learning strategy	Apprenticeship learning	Collaborative learning
Subjects/Community	More knowledgeable and less knowledgeable	Peers with relatively equivalent knowledge levels
Division of labor	Practitioners and Novices Masters and Disciples	Different foci and roles based on individual specialization
Rules	Scaffolding-Submission Modeling-Mirroring Coaching-Constructing	Rules (appropriated) that facilitate the process of negotiation and turn-taking, e.g., querying, clarifying, hypothesizing, elaborating, synthesizing.

From Table 1, depending on the objects or goals, the two processes—*appropriating* and *negotiating* knowledge—require distinctive instructional strategies (i.e., rules and division of labor among teachers and learners). In terms of *appropriating* knowledge, the Vygotskian (apprenticeship) model of learning within the Zone of Proximal Development (ZPD) fits the objective because the interaction is from the more knowledgeable to the less knowledgeable. In other words, there is little flexibility for the less knowledgeable to negotiate and alter or to contribute to the already *negotiated* knowledge. For example, children do not negotiate the alphabet or the sequence

of numbers; instead they *appropriate* the knowledge. In such instances, apprenticeship learning within stipulated ZPDs should be implied.

For *negotiating* knowledge, a social constructivist process is implied, since there is an avenue for reaching intersubjectivity relating to any particular knowledge. Here, the objective is to create new knowledge through which learners cultivate dispositions and metacognitive abilities for operating in the community of learners. For example, when we want students to develop metacognitive dispositions, we engage them in negotiation of the criteria underlying verifiable scientific investigations. Moreover, when we want students to engage in knowledge creation, we make them explore relatively new phenomena (which is knowledge not yet formalized by themselves or by that particular community). For *negotiating* knowledge, social constructivist methods such as collaborative learning, in which students attempt to establish shared new knowledge, is implied.

Following the analysis in Table 1, the apprenticeship learning process can be perceived from the perspective of rules and division of labor. Here the division of labor is between masters (practitioners) and disciples (novices). According to Hung (1999), such relationships center around the processes of "scaffolding-submission," "modeling-mirroring," and "coaching-constructing." Masters (practitioners) engage in scaffolding (formulating the structure for learning a particular skill or knowledge), and disciples (novices) are required to submit to the authority of their masters. The above processes they engage in are the rules in an activity.

On the other hand, in social constructivist settings, the division of labor is between peers with different perspectives and specializations working together on a task at hand. The emphasis is on negotiation of meanings by peers of relatively equal standing and of different perspectives (Lave & Wenger, 1991). The rules (which are processes) undergirding such negotiations include: querying, clarifying, hypothesizing, elaborating, and synthesizing. These processes where negotiation is emphasized are synthesized from studies in which students engage in social construction, such as: *Computer-Supported Intentional Learning Environments* (Scardamalia & Bereiter, 1994) and *Fostering a Community of Learners* (Brown & Campione, 1996).

### Implications for Instructional Technology

Congruent to our argument above, we would like to extend Jonassen's (1995) taxonomy of technologies supporting learning communities to include the dimension of appropriation. Jonassen's categorization of technologies which support communities of learners

falls into "active," "constructive," "collaborative," "intentional," "conversational," "reflective," and "contextualized" technologies. In our opinion, these technologies apply mostly to *negotiating* knowledge, because the central focus undergirding these technologies is collaboration and the processes supporting negotiation. We therefore suggest that Jonassen's framework be further expanded to include technologies which support processes such as modeling and mirroring (Hung, 1999). Evidently, the processes of modeling-mirroring are behavioristic and cognitivist (information giving and processing) in orientation; however, Polanyi (1964) advises us not to undermine such a process because implicit understandings are formed through such actions.

We suggest that the modeling-mirroring processes can be supported by more "traditional" technologies, such as drill and practice software (behavioristic), tutorials, and intelligent tutoring systems (cognitivist). These more traditional environments have been successful for supporting the appropriation of knowledge, such as the typing skills, number sequences, alphabets, etc.

In the future, we envisage integrated environments (regardless of new or traditional) supporting both *appropriating* and *negotiating* knowledge. In such environments, there is a focus on the interactional processes between learners of the community in which supporting will be directly related to different roles and rules based on the intended objectives. We recognize that future research is needed to identify these interactional processes (e.g., through case studies). From these processes, we would then be able to assess dimensions in which technological support is needed. These insights would in turn enable us to conceive of integrated environments in which both *appropriating* and *negotiating* knowledge would have their attributes fulfilled. □

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