

Using Activity Theory to Understand How People Learn to Negotiate the Conditions of Work

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In a typical workplace in the United States, two knowledge-producing activity systems are in motion. Each produces knowledge about how to do the work of that workplace, but they are differently motivated: one toward productivity, and the other toward earning a living. The conflict between these two systems is addressed through the process of negotiation. A.N. Leont'ev's insight on the power of motive to shape an activity system through which consciousness is constructed provides direction for exploring how people learn to negotiate their conditions of work. Observations and interviews conducted in the course of my work as a union-based and then a university-based labor educator suggest that negotiating knowledge (NK) is similar to work process knowledge in that it is useful for the work that is being done, has a theoretical dimension, and is generated by problem solving. However, because it is generated through the second activity system, it differs from work process knowledge in its perspective. Characterizing NK makes it easier to recognize and enables research into its creation, which in turn can inform the practice of labor education. Examples considered in this article include a grocery warehouse, steel mill, cleaning company, federal office, an apartment building, public school, and musical instrument factory.

How do employees learn to negotiate the working conditions that benefit them and resist or improve the working conditions that injure them? How is this negotiating knowledge (NK) produced? What is the character of this knowledge?

TWO KINDS OF KNOWLEDGE: KNOWLEDGE FOR PRODUCTION AND KNOWLEDGE FOR NEGOTIATION

It is commonplace that people learn on the job. The value of seniority and work experience as well as the existence of informal and formal on the job training programs presume that people learn on the job or, to put it another way, that work process knowledge (Boreham, 2002) is produced on the job. However, more than one kind of knowledge is produced on the job. Workers learn not only how to produce goods and services but also how to protect their jobs and themselves on the job so that they can earn a living. At times, the first outcome conflicts with the second: producing goods and services conflicts with earning a living. The conflict is at the level of the motivations of the activity systems. To negotiate this conflict, the second type of knowledge, NK, is required. To be used, NK must be produced. Where and how is it produced on the job?

MOTIVATION: THE KEY TO SURFACING AN ACTIVITY SYSTEM

Activity theory, by establishing *motivation* as the key to understanding activity, gives US a way to answer this question. "The main thing that distinguishes one activity from another lies in the difference between their objects," wrote A. N. Leont'ev (1977), adding that, "the object of activity is its *motive*." (p. 5). Thus activity theory can make visible two conflicting activity systems simultaneously present in the workplace, each defined by its overarching motive. One takes the employer's perspective, the other the employees'. Unless we can distinguish these two motives and two activity systems, much of what goes on in the workplace will be, if not ignored, then misunderstood.

According to Roth and Lee (2007, p. 201) the Russian word, which we translate as "activity," has connotations of *work, job, function* and *doing*. A different word is used for *effort* or *restlessness*. However, here I use the term "activity" in an even more specialized sense:

Activity in the narrow sense is a unit of subject-object interaction defined by the subject's motive. It is a system of processes oriented toward the motive, where the meaning of any individual component of the system is determined by its role in attaining the motive. (Kaptelenin & Nardi, 2006, p. 60)

The -system of processes- includes operations, the visible, evident behavior that one can easily see; "actions," the higher level into which operations are organized; and motive, which is the organizing principle of both actions and operations (Kaptelenin & Nardi 2006). "Activity" in

this sense places even more emphasis on the power of the motive of the system to define the system.

The subordination of operations to action and both to motive was central to the development of activity theory in its earliest, or “first generation,” form in the Soviet Union, under the extreme conditions in a hospital for soldiers wounded during World War II. In June 1941, the Russian Army began to suffer the first wave of what would become a torrent of casualties. So many soldiers were wounded so soon in 1943 that the Russian Army leadership forbade the discharge of soldiers who could be rehabilitated. Instead, they set up, within the existing system of evacuation hospitals, a group of special hospitals to concentrate on rehabilitation. The book titled *Rehabilitation of Hand Function*, by A. N. Leont’ev and A. V. Zaphrozhets (1960), documents their work in one of these hospitals. Leont’ev and Zaphrozhets demonstrated that the same behavior (lifting a tool) could produce a successful or unsuccessful therapy depending on what motivated it. An exercise performed merely as exercise (gymnastics) would be ineffective; the same exercise performed for a purpose that made sense (carpentry) would be effective. Writing years later in *Activity, Consciousness and Personality*, Leont’ev (1978) explained, “The sense of the action changes together with a change of its motive. In its objective content, the action may remain almost the same, but if it had acquired a new motive then psychologically it has already become different.... (p. 173)

The importance of this insight for the study of the production of both work process knowledge and NK at work is that what appears to be the same behavior can mean (“the sense of the action”) different things depending on what its motive or purpose is. Actions intended to satisfy productivity goals can look the same as actions intended to protect or advance a workers’ ability to earn a living. But viewing them as components of two different activity systems makes it possible to distinguish them from each other.

An activity system has components that can be conceived as linked in a hierarchy. Motive, or purpose, is the organizing principle behind the links. If the overarching level is the motive, the intermediate level can be called “actions.” The smallest elements can be called “operations.” Figure 1, taken from Kaptelinin and Nardi (2006), shows this hierarchical structure of an activity.

In the context of the rehabilitation hospital, this figure could represent either the gymnastic or the tool-wielding exercise. At the operations level, the two would look the same; it is, the motive that makes the difference. The same is true in a workplace. Although one system produces knowledge for the production of goods or services, the other produces knowledge of how to earn a living, keep a job, and do the job safely. One is about how to do the job, the other is how to protect the job. Thus, the systems themselves are different, yet from the point of view of a visitor walking through a workplace they are indistinguishable. We need to separate these two systems to study the one that produces NK.

Activity theory provides a way to surface and make visible these coexisting systems. Take the example of a grocery warehouse. Thirty men are “pickers.” The job consists of taking an order (a list of items), creating an efficient path through the warehouse on a forklift to find the items, accumulating them on a pallet, and delivering them to the loading dock in an arrangement that will enable the driver of the truck to load them efficiently according to the route for that day. This description of “the job” is what takes place at the operational level of the activity system. But at the activity or motive level, two different things are taking place. From the employer’s point of view, the success of the business will depend on the workers’ ability to quickly and accurately get the order from the list to the loading dock. From the workers’ point of view, the success of his day’s work also includes not straining his back, keeping cordial relationships with coworkers, perhaps being able to take a break.

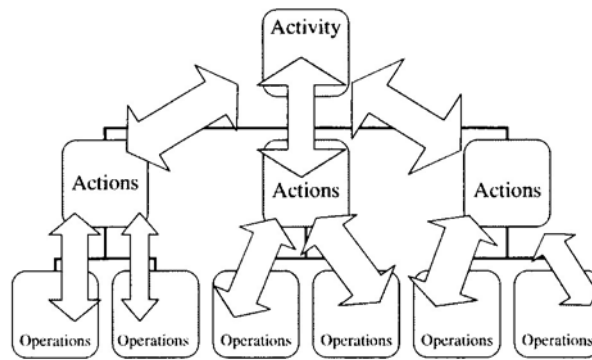


FIGURE 1 The hierarchical structure of activity systems. On the lowest level are operations, the sequential things that one does in the course of completing a task. Operations, by themselves or together with other operations, form Actions. Actions are at the level of a whole task; they accomplish goals. Overarching these but also shaping them interactively is the Activity itself, defined by its purpose or motive, of which many goals can be a part (and of course many, many Operations.).

It may be that at a given point in time, the two activity systems coexist and are not in open conflict: A worker can both get his job done and earn a decent living doing it. But NK becomes important when that coexistence breaks down. Perhaps the employer's need to stay competitive induces him to set new competitive performance incentives. Workers who complete more orders will be rewarded with a bonus; workers who complete fewer risk losing their jobs. Now, what do the "operations" mean? A young worker speeds up, not just to do the job but to keep her job. The forklifts travel faster. An older worker pulls a muscle, gets angry, and gets disciplined by his boss. Another worker gathers some people together and cautions them that if they accept the performance incentive competition, new baseline standards will be set by the employer and they will all find themselves working harder and faster for the same pay. They listen, learn, and collectively agree not to compete. Now they work differently. The operations still look the same to an outsider: take the order, find the route, pick the boxes, and make the pallet. But the actions are different; instead of competing against each other, the workers are coordinating their pace. Their motive is now to regain control of their work. An outside observer cannot understand what is being learned here without knowing what is actually going on: "The psychological features of individual consciousness can only be understood through their connection with the social relations in which the individual becomes involved" (Leont'ev, 1977, p. 12).

Furthermore, this cooperative activity system is directly in conflict with the competitive production activity system of the workplace under the incentive plan. Figure 2, which takes the Kaptelinin and Nardi diagram and lays it on its side so that the operations level is shared, illustrates how these two activity systems interact with each other.

In practice, for the survival of a workplace, the two activity systems—producing goods and services and earning a living—must be compatible. The process through which points of incompatibility are adjusted, or not adjusted, is negotiation. Negotiation is generated by problems. It can succeed or fail. It involves individuals or collectives, takes place within a richly social and cultural context, has a historical trajectory, and develops over time. At many workplaces in the United States, negotiation has saved neither the business nor the job. In Illinois we lost 181,000 manufacturing jobs (about one fifth of the total) just between 2000 and 2005 (Wial & Friedhoff, 2006, p. 6). This underscores how important it is to explore how the knowledge necessary for negotiation is learned. Can activity theory illuminate how this kind of learning, NK, is generated through the activity system of work?

HOW NK IS PRODUCED IN AN ACTIVITY SYSTEM

The aforementioned example of the grocery warehouse was simplified but is taken from life and can be revisited in more detail. In the example, there are three characters who in specific ways represent the levels of knowledge of the workforce. The young worker who is eager to compete for the productivity incentive bonus knows very little about how concerted activity (this is actually a key term from the federal collective bargaining law, the National Labor Relations Act

of 1935) provides gravity for negotiations with an employer. The older worker, who also competes but is injured, becomes angry and is disciplined for his reaction. The older worker is not naive like the young worker, but neither is he acting strategically. The third worker who gathers a group of workers together, explains what is going on, and persuades (or teaches) them to act together (engage in concerted activity). has probably had a personal experience of a similar situation of workplace conflict and may have received some training in effective ways to respond.

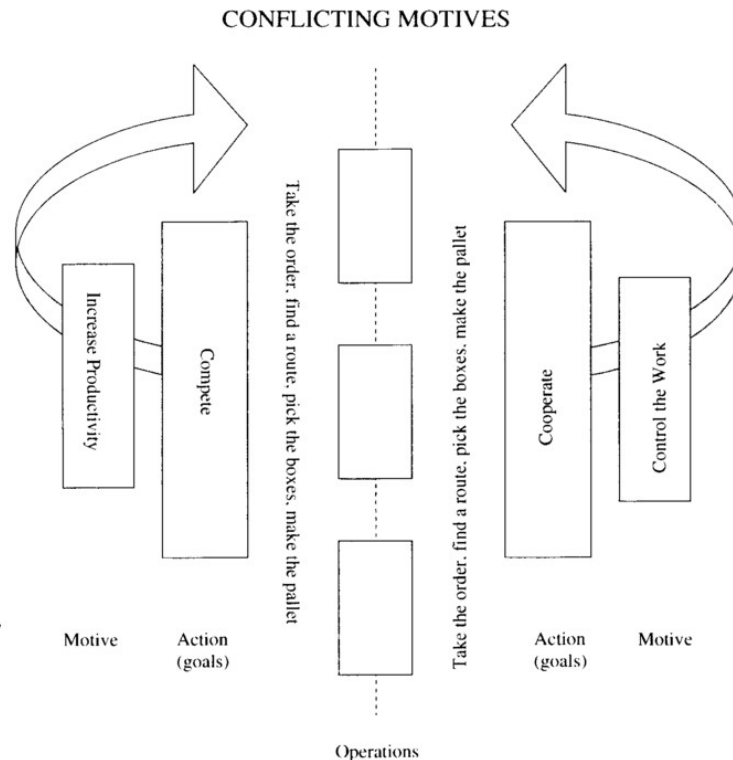


FIGURE 2 Operations may look the same but different motivations give them a different meaning.

His approach, the work slowdown, was a standard workforce response to lowered labor standards in the early 1900s before the development of labor law in the United States. In this case., the outcome of action (in the sense of the middle level of the activity system) was to bring the employer to the negotiating table with a credible threat (of work slowdown and workplace injuries) behind it. These three workers illustrate points on a continuum of learning, but their experience in this crisis is also part of the story of the production of NK.

What has happened in this example is that a component in the activity system has changed. The operations are the same, but because the motive has changed-from production to earning a living-the actions have changed, from competing to cooperating. The social relationships of cooperation are different from the social relationships of competition. This change, which was initiated by the problem of the speedup caused by the promise of a bonus for faster work, educates the workers by changing their social relationships. They observe themselves and their coworkers, recognize the difference, and see their work differently. Thus, “activity is bound to encounter man-resisting objects that divert, change and enrich it. In other words, it is external activity that unlocks the circle of internal mental processes, that opens it up to the objective world- (Leont’ev, 1997, p. 5). In this case, the activity is earning a living. The “man-resisting objects” are the productivity incentives. Of course, other changes in working conditions occur all the time: A member of a team may retire, the size or weight of boxes to be lifted may change, or a new customer may require redesign of delivery routes. Thus learning has the potential to be continuous. When the components in an activity system change in certain ways, the -circle of internal mental processes” is unlocked, and the people who are involved in these relationships represented by these systems have an opportunity to learn. Roth and Lee explained.

Learning occurs whenever a novel practice, artifact, tool or division of labor at the level of the individual or group within an activity system constitutes a new possibility for others, (as resource, form of action to be emulated) leading to an increase in generalized action possibilities and therefore to collective (organizational, societal, cultural) learning. (Roth & Lee, 2007, p. 205)

The components listed by Roth and Lee are a reference to the assumption that activity systems are richly embedded in social contexts, and those contexts are themselves in motion, with a history and a future. The richness of this context can be suggested by using the well-known triangle model (Engeström, 1987) of an activity system (see Figure 3).

This model is an abstraction that can be used as a tool to organize and investigate an actual situation. Each point on this model is a component of an activity system. It is important to consider how these points are connected; each component presupposes the existence of the others (Roth & Lee, 2007, p. 196).

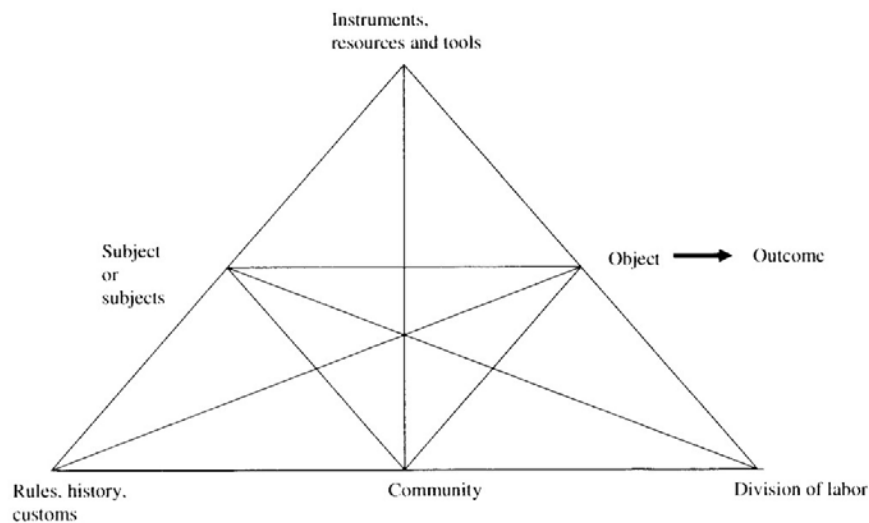


FIGURE 3 A generic activity system, based on Engeström (1987). The subject (the person or persons engaged in action) is motivated toward an outcome and acts on some object to achieve that outcome. Each element of the system has its own rich history and social context.

Each one has its own history and social context. Changing any one of these components - unlocks the circle of internal mental processes- and will make a difference in the way the activity system moves toward fulfilling the motive that organizes it.

To demonstrate how richness of the social context of an activity system can be framed for investigation and analysis, we can use Roth and Lee's example of a seventh-grade science class that participated in the clean-up of a local watershed ecosystem that included a creek. In explaining, how learning took place within this activity system, Roth and Lee listed products that the students created in the course of their study, ways in which these products were shared with the community, publications in the local newspaper about the project, and the changing identity of the students from "mere middle school students to being young citizens enacting concern for the environmental health of their community- (Roth & Lee, 2007, p. 194). Each of these items (and there were others) was a changing component in the activity system of learning science. Included, whether at the level of actions or operations, are the use of tools (tape measures, nets, stopwatches), the creation of social organization (division of labor to accomplish the project), and the community around the watershed. These components provided and continue to provide the context for this activity. Roth and Lee explicitly named these components and added that, "with the necessary vocabularies to understand cognition holistically in CHAT [cultural historical activity theory], it makes the learning that is normally invisible amenable to deep reflection and analysis- (p. 195).

In any workplace there is an equally rich social context, similarly analyzable into the components depicted in the Engeström model. Again, changes in one or more of those components "unlocks the circle" and opens the social space up to opportunities for learning.

USING ACTIVITY THEORY TO DESIGN A CURRICULUM FOR A GARMENT SHOP

I now turn to some work that I carried out in 1998. I was working as a labor educator for a union that represented workers in the garment and textile industry. My job was to identify and encourage NK in this workforce. This was a case of on-the-job research. My process corresponded to Kaptelinin and Nardi's (2006) description of the research methodology of activity theory: "Activity theory starts from the problem and then moves to the selection of method- and "the basic research method in activity theory is not that of traditional laboratory experiments but that of the formative experience which combines active participation with monitoring of the developmental changes of the study participants" (pp. 71-72).

This was a small union in which many of the shops had been unionized for generations. The work, whether it was weaving lace, sewing shoulder pads, making ribbons and hats, or sewing fine men's coats, was done well and efficiently. However, since the 1970s, wages had dropped by half. The industry was rapidly vanishing from the United States and union membership was plummeting. The reorganization of production ranged from introduction of modular production (rather than assembly line; for descriptions see Applebaum, Bailey, Berg, & Kalleberg, 2000; Applebaum & Batt, 1994), to subcontracting cutting and sewing to nonunion shops, to moving a whole label to Mexico, India, or China. I turned to activity theory as a guide to help me discover, through interviews and observations over the course of the year, what these workers knew, did not know, and needed to know. I had to learn how to look at what I was seeing, in the shops and interpret what I was seeing, in terms of its motive. As I noted previously, the same operations could be attributed to either motive. It was a situation suited to Leont'ev's (1977) description of problem solving using activity theory:

Analysis first identified separate activities, according to the criterion of the difference in their motives.

Then the action processes obeying conscious goals are identified, and finally, the operations that immediately depend on the conditions for the attainment of a specific goal. (p. 7)

With this insight I would design a curriculum that would support their goal of protecting their jobs, to the extent that that was possible. I had the advantage over most researchers of workplace learning because, as an employee of the union, I was able to interview people and directly observe them at work interacting with their employers.

I found out that the knowledge these workers possessed was technical work process knowledge. Among the experienced older workers, this work process knowledge was close to complete. Even the workers engaged in the most Taylorized specializations knew virtually everything there was to know about the garments produced in their shops. However, their interactions with their employer during disputes suggested that they knew little or nothing about the legally established tools and resources that were components of their activity system of earning a living. Interactions with employers and supervisors tended to be bitter, brief confrontations over limited goals. Although an hour's pay or a day off certainly would matter to these workers, the effort invested in these fights seemed futile in the light of what lay ahead for them given the trajectory of the industry. As a union strategy, this puzzled me until I investigated what kinds of documents and agreements were mediating this interaction. Many workers, it turned out, had never seen a copy of their contract, nor were they aware of the various labor and employment laws under which they worked. They were unaware of legal processes that applied to workers across any private sector workplace that gave them something in common with workers in other industries. In several shops, the only point of contact for negotiation of problems was through the piece-rate sheet, the document that displayed agreed-upon prices for different work operations. In other words, they were missing many of the components of the activity system that produced the knowledge needed to negotiate on the level necessary to save their jobs.

I built the curriculum by mapping the social relations of their work onto the activity triangle: community, division of labor, the history and rules that worked both for and against them, and the resources available to them. It took as its starting point the history of the industry in which they were working. It included major labor laws, the trade agreements that were hollowing out their industry, labor regulations, their own contract and the grievance process, and some comparisons between working conditions in the United States and the countries to which work

was being sent. NK had to include some political economy. These workers had to develop some insight into the kinds of training they might need to get different jobs. Having spent their lives over sewing machines, none of them could operate a computer. As second- and third-generation union members, they had no appreciation of what being an “at will” employee is like, or-most important-how to organize a union where one has not previously existed.

The content of this curriculum was obviously not work process knowledge, but it was just as central to the ability of these workers to make a living as their knowledge of how to produce fine apparel. They adopted and applied what was laid before them with a rapidity familiar to teachers of adults, as if what they were learning only made conscious what they already knew. The quickness with which they grasped the curriculum led me to think more about what base of knowledge it was building on. This base would be the NK that workers produce for themselves. This leads us to a discussion of the character of NK itself: its emotional quality, its scope, its perspective, and its distribution.

THE CHARACTER OF NK

If we agree that people learn in social contexts, it makes sense that what people learn will be shaped by the social relationships of that context. Presumably, every context shapes the learning that occurs within it: the church, the military, the family, schools, the correctional system, any of the other total institutions. The question is how learning is shaped in the context of work. Boreham (2002) reported that participants in a 10-country network sponsored by the European Commission to research workplace organizational change came to consensus on a characterization of work process knowledge: that it is knowledge that is useful for the work being done, it has a theoretical dimension, and it “arises out of efforts to resolve contradictions between what the theory predicts will happen . . . and the reality that confronts them- (p. 8). This kind of characterization can be applied to NK, with the difference that “the work being done” is earning a living, not producing goods or services. Thus we are talking about knowledge that is useful for keeping a job or protecting or raising labor standards, the theoretical dimensions will have to do with employment relations, and the contradictions will have to do with threats to one’s job. However, there is an important difference. NK is primarily shaped by the social, rather than the technical, relations of work. Although these social relations can be unproblematic, they can also be fraught with conflict. Thus a characterization of NK must account for the effects of conflict, especially because NK like work process knowledge is generated by contradictions, which are experienced as conflict. Thus NK is characterized by perspective or point of view. It can be charged with emotion. It can be narrow or broad, and it can be organized so that it is distributed to individuals (each individual knows as much of the whole as he or she can) or distributed throughout a group (no one necessarily knows the whole thing, but the knowledge is understood to be shared). School learning, by way of contrast, is usually taught and assessed individually. Workplace knowledge, especially negotiating knowledge but also work process knowledge, is almost always organized, generated, and held collectively. In a workplace where the social relationships have been negotiated to achieve a level of perceived fairness, NK will have one kind of character. In a highly coercive workplace where the relationships are very unequal, NK will have a different character. But NK will always have perspective, an emotional charge (or “emotional coloring,” as Leont’ev, 1977, p. 18, put it) will be broad rather than narrow (will have a theoretical dimension) and will be held and created collectively.

Just as a composition or math teacher begins by assessing what students already know and what level they are functioning at, a labor educator has to begin by investigating the character of the knowledge their students possess. This is the base on which the next step is built. I elaborate on these four qualities one at a time.

Perspective

NK is not neutral. It is organized from a point of view. This is “partiality,” the bias acquired by “the movement of meanings in the system of the individual consciousness” (Leont’ev, 1977, p. 17). This is because it is created through the enactment of an activity system that is organized to accomplish a motive. Thus actual information about the workplace is organized in NK in a way that serves the struggle to make a living. For example: Where are the exit doors? How big should the things be that I have to lift? How do I deal with the change in loading procedures

that means I can no longer take the most direct route between deliveries? Where am I on the overtime list? Shall I drive this van if I think the brakes are bad? Shall I report that leaking package, or ignore it? Whom should I trust? Who will teach me to solve this problem and who will turn me down? Shall I accept the productivity incentive even if I know the competition will penalize older, slower workers? Shall I agree to sign off on this report, even if I know it leaves out something important? Information about how to do the job, how to behave, how to present oneself, and how to interact with others is shaped by this perspective. This is similar to how a map organizes geographic information according to its purpose. A highway map, a geological survey map, and a weather map look different even though they map the same territory. All three are examples of information organized for a purpose, but as each purpose is different, so is each map. Just so, information about someone's job may be organized as work process knowledge to support the motive of production, or it may be organized as NK to support the motive of earning a living. When the social practices of a workplace are more egalitarian, when the job is fairly secure and safe and the quid pro quo (the wages or compensation that the worker gets in exchange for work) is experienced as being reasonable, the slant of the perspective may not be very steep. As the social practices move along the scale toward more coercive, however, the perspective becomes steeper and steeper. The perspective looks up at the people who have supervisory authority and down at people who are under one's authority, and in both directions these people and their work are foreshortened to fit this perspective. One way to test the power of this perspective is to try to change it. For example, a common teaching technique in labor education is to do a role-play of a bargaining session. One of the biggest challenges is to get the students who are assigned management roles to look at the way they have organized their knowledge about their workplace and re-map it from a management perspective.

Emotional Charge

NK is not only embodied in a strongly slanted perspective, it is highly emotionally charged. Just as the social relations of work have an emotional valence, so does the knowledge produced through them. It is deep in the way that emotion about someone's home is deep. Sometimes it expresses itself as pride, other times as a sense of professionalism in a job that is not ordinarily considered -professional.- An example of this kind of job is home care of the elderly, a job that requires intelligence, compassion, and responsibility but is low paying and insecure. Sometimes the emotional charge of work is revealed through a quickness to rise to anger. The anger that erupts when someone's sense of owning a job is violated taps this emotional depth. When workers talk about what they want from their job but are not receiving, the word most commonly mentioned is not money but *respect*. Under current economic conditions, with downward pressure on labor standards in both the public and private sector, many people feel afraid of losing not just their job but their benefits, which in the United States are usually employer based. Emotion also swings between the poles of anger and fatalism, when a worker feels that their struggle to make a living, or to survive the job, is futile. To understand the intensity of the emotional charge that infuses NK, one must remember that for most workers, what they know about how to survive their jobs is produced in a context where the power differential is extreme. Leont'ev (1977) saw the potential for this: -Moreover, the class division of society puts people into unequal, opposed relations to the means of production and the social product; hence their consciousness experiences the influence of this inequality, this opposition" (p. 12). It is very important for teachers to appreciate the intensity of this emotion. This does not apply only to labor educators. As more adults return to school to complete their degrees or get alternative training due to the pressures of the job market, they carry with them into the classroom this emotionally charged knowledge.

Collectivity

NK is both created and held collectively. As social and political knowledge, it is not developed by a single individual in isolation and no one person will possess all of it. Activity theory enables us to view actions as collective, organized by a shared motive, and helps us understand how a representation (in the sense of picture or mental image) of an entire activity system can be dispersed across multiple individuals and still serve a single purpose. On the shop floor we can see that the mechanics of this representation's maintenance and development are closely related to the mechanics of its original production. By "mechanics" I mean the layout of a

workplace: sightlines across the tops of machines; what can be heard over the noise or what cannot; the interoffice communications; the frequency of meetings; the mentoring opportunities; shared secrets of efficiency; the bulletin boards (when they are allowed); and the time spent in a locker room, lunchroom, or shower. These activities construct the representation of the workplace in the consciousness of the workers. If there are committees or teams of workers at a workplace, the social relations of these participant structures will be instrumental to the creation of this knowledge. If the workers at this workplace have a union, the social relations of the union will be instrumental to the creation of NK. Within these social structures lie the possibilities of communication, collective memory, and collective learning. These social structures also generate and control the tools and resources—documents, e-mail, calendars, and so on—that make the creation and maintenance of NK possible. Again, the purpose or motive of the structure will be reflected in the kind of knowledge that is collectively held in it.

Breadth

Finally, NK is broad. This is a consequence of its collective, shared character and the fact that it is generated by problems or contradictions, the solutions to which may extend throughout the workplace and into the world beyond. Although a worker may perform work only in one area, or do repetitive tasks that complete only a small fraction of the product, the knowledge that we are talking about is not limited to those operations. Of course, the ability of workers to put this knowledge together accurately will depend on the social relationships and communication practices that they are able to sustain. But when these relationships are well established, NK encompasses what comes in on a loading dock and what goes out in a delivery van, what happens in an emergency room and what happens in an intensive care unit, what happens in a grievance meeting and what happens in the legislature, and everything in between. Fischer (2002, p. 13 1) explores and clarifies the concept of “experience” to explain how the direct experience of work engages theoretical challenges to produce work process knowledge that has a theoretical dimension. The same can be said of NK.

With good communication practices, NK can be put together rapidly even in a new plant. One group of workers at a small (less than 100 employees) steel mini-mill went from having no union to developing a union with a decent contract and effective contract enforcement in less than 10 years. This was a mill that had been deliberately sited in a rural area with little previous industry, where there was little likelihood of hiring employees with union backgrounds. The mill’s original hires were deliberately selected to be young, with high school education only, to avoid hiring people with prior union experience. After the mill had been built and the machinery installed (by these same workers), and the employer failed to deliver on some promised benefits, the workers leveraged their work process knowledge into negotiating knowledge.

NK APPLIED

Here are three brief examples of NK in context. They illustrate several important points: First, NK is applied in the same site as it is generated, the workplace; it is applied in a context of conflict; and the people who are engaged in negotiating a resolution are at various stages of development and are therefore (in varying ways) learning as they go. The interaction between workers and employers could be seen as a dialog interaction. However, unlike other dialog interactions that take place in school or informal learning situations where the motive of the activity is clearly to learn, the intent behind this interaction is not to “teach” but rather to manage conflict. In this sense, it is different from a dialog that takes place in the zone of proximal development, a Vygotskian (Vygotsky, 1978; Wertsch, 1985, 1991) concept of an interaction in which someone, by being helped by a more expert peer, exceeds what he or she could do on his own. Although learning inevitably and necessarily takes place through this interaction, it is not the point of the interaction—on the contrary. A close-grained discourse analysis of a negotiation dialog would be of considerable interest.

The first example involves four people: the first, a janitor, a Polish-speaking woman who cleans offices at night, is suspended by a second person, her supervisor. A third person, a lawyer who works in one of the offices, has accused the janitor of throwing away important papers left in a bag on the floor beside the lawyer’s desk. This is a situation in which a complaining client might cause the cleaning company to lose its contract. The fourth person is the union representative, who is bilingual Polish-English. It would be easy for the cleaning company to

solve the problem by simply getting rid of the worker, whether or not the accusation is true, and then report this to the client as a “corrective action.” However, this is a unionized workplace. The janitor, upset by the loss of her job and income, tells a coworker about the incident, and this coworker tells the janitor to contact the union. The union rep, a woman who was herself at one time a janitor, is well informed about both the workplace and the union procedures for dealing with discipline imposed on workers. The janitor explains that she often has difficulty distinguishing between things that are to be thrown away and things that are to be kept. The union representative reviews the operating procedures of the cleaning company and sees that all objects that are to be thrown away are supposed to be bagged and marked with an orange sticker. She visits the workplace and observes items in the service elevator being thrown away, some of which have orange stickers on them and some of which do not. She is able to show the supervisor that the company is inconsistent in applying its procedures and that the discipline given to this janitor (suspension) was -disparate treatment.” “Disparate treatment” is one of the seven tests of just cause, an informal legal concept. This is an argument that will hold up under arbitration, should the matter come to arbitration. The supervisor knows this. He reinstates the janitor and provides training for both the janitorial workforce and the client’s workforce (the lawyers) to put orange stickers on all things that are to be thrown away.

Consider the different experiences of learning that take place in this incident. The union rep, using her broad general knowledge of the workplace and the documents that govern the employment relationship, researches the specifics of this workplace and turns back an effort to unfairly discipline a worker. She uses rules (labor law, arbitrator’s criteria for just cause discharge, the procedures of union representation) and tools embodied in literacy practices (the union contract, the book of operating procedures, the criteria used by arbitrators to decide cases like this, the orange stickers themselves) to achieve her object. For her, the playing field is fairly level because of her well-developed negotiating knowledge, but she is animated by the memory of the recent years when she herself cleaned offices and was also afraid of the supervisor. That emotion moves her when she defends her members (or “her ladies, “as she calls them). She introduces the Polish-speaking janitor to the rules and tools she has come to know. The janitor gets only a glimpse of the system that is being activated to protect her, but it is a beginning, an entry. For this woman, the emotional shock of first losing her job and then getting it back charges what she has learned with strong feeling. From now on, as she moves from one off-ice to another during the night, she will organize her perceptions about the workspace differently. The supervisor also learns and passes this information on rather quickly to the workforce, training them to “see trash using orange stickers. A channel for de-escalation of conflict has been created (the training in use of orange stickers) and the collective NK of the union has been increased by the experience of the janitor who got her job back.

The second example focuses on the breadth of NK. Federal employees are classified into levels, each level representing a kind of work differentiated by its complexity and difficulty. However, many workers do (or believe that they do) work above their level. They want to apply for promotion-both for the salary increase and for recognition that what they do is in fact more complex than what they are getting credit for. The goal of maximizing productivity leads some managers to assign more complex work without the accompanying promotion and salary increase, and these managers may be reluctant to help the employee write up a successful application for promotion. It falls to the union steward to assist in this matter. Within the union, therefore, the knowledge of how to write a successful “work accrual” promotion request has been developed collectively. The content of this knowledge is meta-knowledge about the various kinds of work done by employees all over the agency. It resembles in many ways the knowledge of competent managers, but it is organized to project advocacy on behalf of the employees. Like other NK, it is created and held collectively.

Expert knowledge has different values in different contexts. This value is closely tied to the history of negotiation in a specific workplace. The moment when a worker becomes aware of the value of his or her expertise helps to explain the emotional charge and the perspective with which that expertise is suffused. The following incident took place in a labor education class. A case study was presented to the class involving a safety issue for workers in the paint shop of an automobile assembly plant. In the case study, the workers warned that the paint oven was overheating and they feared an electrical fire. Management responded that the temperature was

correct. The dispute led to a work stoppage until the technician from the equipment provider came out and reset the temperature controls.

In the class were two building engineers and three teachers. Building engineers run the complex heating, ventilation, and electrical equipment that makes an apartment building or skyscraper function. One teacher was a public school biology teacher who worked at three different schools, carrying her materials from school to school in the trunk of her car. Another worked in the county jail where he taught the General Education Diploma (GED) program, and his program had just been eliminated. The third taught social work in the community college that had just eliminated its counseling program. This teacher had started her own free counseling program using volunteers from another college, but her program was stalled because she could not obtain a room on campus that would provide privacy for the students. All the doors in all the rooms had glass windows, and this teacher had been told she was not allowed to create privacy by putting brown paper over the glass windows.

As the students worked through the problem of how the union would deal with the safety issue, the building engineers protested, "This is completely unrealistic. It would never have happened. "According to them, no employer would dispute their opinion that some piece of equipment was too hot or dangerous. That's what they pay us to know," they said. At this point, I noticed the teachers looking at the building engineers, dumbfounded. Their expertise, about how children and adults learn and what kinds of environments are needed to make learning happen, was disputed on a regular basis. The building engineers were not frustrated in their ability to do their work, and their equanimity about their expertise was palpable. The teachers were frustrated, and their bitterness about their expertise, a combination of regret and shame, was equally palpable. The difference between the two was evident to everyone in the class.

All three of these examples underscore the importance of viewing the production of knowledge in the context of the motive of the activity system within which is the knowledge is being produced. In the case of the cleaning company, the supervisor (as an agent of the employer) and the union rep (as a representative of the workers) were initially in opposition but found a channel (reinstatement, training) through which to resolve the confrontation, ultimately improving the logic of the work by encouraging the client to take responsibility for identifying objects to be thrown away. In the case of the federal employees, the resistance to awarding promotions and raising salary levels served the motive of productivity (keeping labor costs down) while the cooperative collection of meta-knowledge about the complexity and difficulty of work as it is actually being performed served to increase the share of the value of the work that redounded to the employees. In the case of the building engineers and the teachers we see another product of an analysis that placed the knowledge of a worker in the context of an activity system propelled by a motive. Through these examples we have been able to contrast and speculate about the actual (as compared to the official) motives of the activity systems of which the employment situations of these people are a part.

The expertise of the building engineers-their knowledge of how to manage the temperature controls of their buildings, for example-had a high value in the context of negotiating the conditions of their jobs (the building owner hires them in the expectation that they will protect his property). This technical knowledge was created and protected through an extensive apprenticeship and mentoring system; its price on the labor market is bargained through a highly conventionalized bargaining routine. The employer wants, and gets, expertise in running a building.

The situations of the teachers were quite different. Their expertise was of dramatically little value in the context of negotiating the conditions of their jobs. The science teacher who unloaded her flip charts and aquarium three times a day from the trunk of her car knew how her subject needed to be taught, but she had no power to change her teaching conditions. The GED teacher whose program had been cut from the county jail knew the program could be valuable for the inmates individually and would contribute to avoiding disruptions at the jail, but that knowledge did not influence the decision to cut the program. The expertise of the GED teacher was worthless in this situation. Similarly, the social worker's ability to create a volunteer student-counseling program to provide support for students trying to navigate college was trumped by the requirement that all classrooms be visually accessible. The expertise of these

teachers, in other words, had no value; as far as negotiating the conditions of their work. their expertise was worthless, and they knew it. This does not mean that their NK vanished. It means that it accumulated emotional charge and deepened its perspective on their conditions of work.

CONCLUSION

I conclude with an encounter that conveyed to me both the passion and confusion that workers feel about their own knowledge. In this case, a skilled worker possessed highly developed work process knowledge but very little negotiating knowledge. I then return to the book mentioned earlier, *Rehabilitation of the Hand Function*, written by Leont'ev and Zaphrozhets after World War II and published in English in 1960.

In October 2006, a group of striking workers from a factory in Indiana came to Chicago to speak to a small gathering. The factory at which they worked produced brass band instruments: trumpets, saxophones, trombones, French horns. and so on. The factory, which was more than 100 Years old, had recently subcontracted its production to a factory in China that could make these instruments for a fraction of the labor costs. The instruments would be manufactured at the Chinese factory, then shipped back to Indiana for final finishing. Production workers in Indiana were laid off, and workers in the finishing departments were told their wages would be lowered to about half of what they had previously been earning. The union representing these workers(the United Auto Workers) had determined that this was a fight they could not win and had withdrawn support for the strike. Therefore the striking workers were striking against both their employers and their union.

One of the workers, a finisher, explained his work to the gathering. It was hand work, involving hand-held burnishing and polishing tools. As he described it. he bent his head down and his hands formed the shape of the bell of the instrument. One could visualize the imaginary instrument as he acted out the motions required for his work. He explained the steps that came before what he did and the steps that came afterward. His work process knowledge of creating an instrument was complete. His grasp of what it would mean to negotiate saving his job. or getting a comparable job, was minimal. What angered him, he said, his voice breaking as he spoke, was that the metal alloy of the instruments that came from China was different. He could feel the difference with his hands. The sound made by the instruments was going to be different but the musicians who bought the instruments would think they were getting the same quality of instrument, engraved with the familiar company name. He indicated the difference in the quality of the metal by holding his thumb and three fingers together to signify where in his body his skill was housed. He was unable to express the essence of the skill in words: It was a skill developed over 30 years that connected his sense of touch with a future sound that he was able to imagine. The skill that he was demonstrating with his fingers as he showed us what he did at work was being doubly disrespected. first by being valued at a lower wage, and second by being applied to instruments of lower quality.

His anger was directly related to this double insult, it was not directed at any of the social structures that mediated between him and his work: the union contract, the bargaining process. loss of funding for school music programs and its impact on sales of instruments, international trade agreements, to name a few. Yet knowledge of the overall activity system within which he was trying to make a living would have been useful to him, both in enabling him to act in it more effectively and in mitigating his anger. Conversely, his crisis provided a lesson to those of us in attendance at the event.

Talking to this man, my mind was drawn back to Leont'ev's description of a Soviet war veteran, a blind double amputee, who was undergoing therapy to recapture his engagement with the world. The instrument maker, showing where the skill by which he had earned his living was housed by placing his thumb and fingers together, suggested the war veteran exploring the shapes his therapist gave him with his surgically created "Krukenberg" hands. Leont'ev described the war veteran as helpless and excitable, saying that

From the psychological point of view the most obvious feature in this patient was the very acutely and painfully experienced 'disappearance' of the world of objects. ... 'Things get further and further away from me,' – in this way he described the experience from him of the world of objects. (p. 56)

From the point of view of the instrument maker, his world had also disappeared. Canceling the value of the instrument maker's skill cut him off from his economic and social world in a way that echoed how amputation and blinding cut the war veteran off from his perceptual world.

The introduction to *Rehabilitation of the Hand Function* begins with the statement, "The main task of Soviet medicine at the present time is the eradication of the consequences of war" (Leont'ev & Zaphrozhets, 1960). By this was meant not just the reconstruction of cities, but the return of individual people to useful lives: "The desire of the man as a whole to perform useful work- (p. x). Workers who have lost their jobs, have been threatened with job loss, or have had their jobs devalued often feel socially, if not physically, cut off from their world, They want to know what happened, how it happened, and what could have been done differently. For this, the tools are not just job training or skill matching-the usual approaches. The goal is more ambitious: The question is not, "How can I produce certain goods or services" but "How can I earn a decent living?" Activity theory, by making it possible to separate out the two systems that produce different kinds of knowledge for different purposes, can be helpful in this regard.