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Metaphors of Creativity and Workplace Learning

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Taking a bird's-eye-view of the philosophical discourses that metaphorize creativity as “expression,” “production,” and “reconstruction,” this article depicts their vital characteristics and distinct ways of portraying the relationships between creativity, educative experiences, and the epistemic cultures now occurring within and beyond the workplace. Illustrative examples are taken from an ongoing comparative and longitudinal study that explores the epistemic trajectories of Norwegian nurses, teachers, auditors, and computer engineers. The aim is to provide a better understanding of the contours of creativity in relation to productive workplace learning. This article reveals how different ways of metaphorizing creativity carries distinct images, theoretical representations, and models of thought that provide openings and limitations for our ways of thinking about education and contemporary workplace learning.

Keywords: creativity, workplace learning, metaphors, philosophy of education

What are our images of creativity? How do these images relate to our ways of seeing workplace learning within the new and globalized symbolic economy? I here address these questions, while drawing on three philosophical discourses that metaphorize creativity as “expression,” “production,” and “reconstruction.” A vital family resemblance is that they portray creativity as the *act* of creating something new. Hans Joas (1996) therefore holds that they “contain a potential for understanding human action” (p. 73). By implication, they may also carry a potential for understanding the altering of epistemic cultures, practices, and knowledge ties now characterizing professional work and learning (Strand, 2009; Strand, Jensen, & Nerland, 2010; Strand & Jensen, 2010).

Taking a bird's-eye-view of the philosophical discourses, I point to their vital characteristics and distinct ways of portraying the relationships between creativity, educative experiences, and the new forms of epistemic practice occurring within and beyond the workplace (i.e. Illeris, 2011; Kirkpatrick & Kirkpatrick, 2010; Malloch et al., 2010). The ambition is to provide a better understanding of the contours of creativity in relation to productive workplace learning. The three metaphors, however, should be seen as ideal types, not mirroring any ongoing “epistemic war” or “historic progress,” as their different ways of picturing creativity seem to be equally recognized and their uses somewhat overlap within the current literature (Banaji, Burn, & Buckingham, 2006).

Philosophical discourses on creativity—old and new—demonstrate that creativity is hardly a new way of portraying the dynamics of knowledge and learning. But since the contemporary economization of knowledge and ideas has contributed to a common call for a

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“creative ethos” (Florida, 2002) it seems pertinent to explore the ways in which metaphors of creativity form our ways of seeing the dynamics of knowledge and learning within contemporary working life. I want to emphasize, however, that all three metaphors move beyond the current hype within business circles, in which creativity is paralleled with effectiveness and seen as economic imperative (Howkins, 2007, 2009; Lewis, 2004; Seltzer & Bentley, 2002). Rather, this article throws some light on this hype, since I here reveal the ways in which different ways of metaphorizing creativity offer distinct images, theoretical representations, or models of thought that not only mirror but also provide openings and limitations for our ways of thinking about workplace learning. In cutting across the intellectual landscape of philosophy and the social sciences I here point to some conventional and taken-for-granted assumptions on productive workplace learning within the current creative economy (e.g. Araya & Peters, 2010; Peters, Marginson, & Murphy, 2009). A distinct contribution of this article is thus that it helps to disclose unrecognized implication of the three metaphors, and hence of various approaches to research on workplace learning. I argue here, however, that the third metaphor is the only metaphor carrying a rich potential for embracing the ways in which global/local epistemologies now unavoidably interact, convert, and converge.

To avoid the pitfall of Thales, the ancient Greek philosopher who was so eager to observe the stars that he forgot to watch his steps and thus fell into a ditch, I illustrate my discussion with a few examples from an extensive ongoing study, exploring the epistemic trajectories of Norwegian nurses, teachers, auditors, and computer engineers over an 8-year span (2003–2011). “Epistemic trajectories” here denotes the discontinuous processes of epistemic change, transforming the knowledge ties, forms of practice, and epistemic cultures of the four professions. Epistemic trajectories thus differ from “learning trajectories” in that the epistemic shifts are generated by the knowledge-dependent practices and cultures of contemporary working life (Lahn, 2011). Overall, this study reveals some noteworthy shifts in the epistemic cultures and practices of the four professions studied. But in which ways may these shifts relate to the intersection of global/local epistemologies? Furthermore, what may the three metaphors of creativity make us see and not see? But before exploring how the three metaphors of creativity help to model workplace learning, it is pertinent to provide a somewhat better image of the Norwegian study.

The Norwegian Study

This is an ongoing comparative and longitudinal study documenting how Norwegian nurses, teachers, auditors, and computer engineers—10 from each group—are now geared towards lifelong learning, inclusion, information seeking, and knowledge production. The data material consists of questionnaires, learning logs, individual interviews, and focus groups. The questionnaires were answered by all participants in the first and the final years of their initial professional education, as well as 2.5 and 5.5 years after graduation; the learning logs were written during the first year of the participants’ professional life; individual interviews were performed in 2005 and 2009; and the focus groups the early autumn of 2006. As focus group interviews may again be performed in order to validate the analysis, it is pertinent to stress that the preliminary findings are by no way conclusive. Nevertheless, the study seems to indicate shifts in the epistemic cultures and practices of the four professions.

Findings reported earlier (Jensen, 2007a, 2007b; Jensen, 2008; Karseth & Nerland, 2007; Nerland, 2008, 2010; Nerland & Jensen, 2007) have documented a widespread willingness to

learn due to some common expectations of epistemic change and an emergent epistemification of working life. A core challenge, described by all groups, was to navigate in the ocean of global information and epistemic networks available in a time-efficient and responsible manner. When interviewed again in 2009, the computer engineers portrayed an emerging agile work-style, which contrasts their earlier “torrent” style that demanded specific skills in the fast flows of problem-solving procedures. The teachers all expressed a higher confidence in collective standards and procedures and a more transparent teacher role. The group of Norwegian auditors also seems to have developed new knowledge ties, visible in some new ways of understanding and performing their daily work. Moreover, the Norwegian nurses came forward as an even more specialized and differentiated professional group, revealing some exceedingly focused and short-lived competencies within a professional field of “fast knowledge.” Overall, it seems that there is a shift from a focus on how to process information to a focus on how to produce knowledge (Strand & Jensen, 2010; Strand, Jensen, & Nerland, 2010).

Knorr-Cetina (2007, 2009) and Knorr-Cetina and Bruegger (2005) explain such a shift by the knowledge-related tasks of contemporary “macro-epistemics,” meaning external agents and institutions monitoring, assessing, and validating the processes of knowledge production or verifying its outcome, for example, research policies, transnational institutions or NGOs. So-called “macro-epistemics” thus serve as an intermediary-level of arrangements between a larger knowledge culture (providing scaffolds) and the epistemic “micro-culture” studied (the profession). Despite taking “synthetic situations” into account (i.e. Knorr-Cetina, 2009), they thus propose an analytic split between the global and the local. By contrast, the Norwegian study implies that global/local epistemologies should be seen as inescapably intertwined (i.e., Nerland, 2010; Strand & Jensen, 2010; Strand, Jensen, & Nerland, 2010).

In fact, several authors emphasize that a vital characteristic of the new era is the ways in which global/local epistemologies now interact and convert (Burawoy, 2000; Castells, 2001, 2004; Urry, 2002). Beck and Sznaider (2006), for example, speak of a “globalization from within,” characterized by a reflexive outlook carrying altered images and new habits of thought and action. Speaking of contemporary societies, they claim that the new “. . . is not globalization, but a global awareness of it, its self-conscious political affirmation, its reflection and recognition before a global public via mass media, in the news and in the global social movements” (p. 10). Thus, on the one hand, shared images, worldviews, and habits of thought and action are now becoming more and more “global.” On the other hand, there is also a growing *global awareness* of these new images, worldviews, and habits of thought. As this new awareness is generated by and in turn generates people’s everyday life—including their working life—we may not only speak of a “globalization from within,” but also of a “globalization from below.” This kind of “globalization from below” does not necessarily relate to the global social movements and NGOs resisting the oppressive effects of a globalized economy and transnational policies, but rather to the new *conscience collective*, collective habits of thoughts, images, or aspirations produced by—and producing—the current transformations of everyday life, including social institutions and societies. Following Castoriadis (1987), these collective images can be conceptualized as products and productive of epistemic ruptures:

. . . just as society cannot be thought of within any of the traditional schemes of coexistence, so history cannot be thought of within any of the traditional frameworks of succession. For what is given in and through history is not the determined sequence of the

determined but the emergence of the radical otherness, immanent creation, non-trivial novelty. This dynamic manifests itself in the existence of history *in toto* as well as by the appearance of new societies (of new *types* of societies) and the incessant transformation of each society. (pp. 184–185)

The ways in which global/local epistemologies now unavoidably interact, converge, and convert can therefore be seen as an “immanent creation,” a “radical otherness,” a “non-trivial novelty” that “appears as a behavior that is not only ‘unpredictable’ but *creative* (on the level of individuals, groups, classes or entire societies)” (Castoriadis, 1987, p. 44). By implication, the shifting epistemic cultures of the Norwegian professions can be seen as *creative* shifts parallel to the “non-trivial novelty” of the ways in which global/local epistemologies unavoidably interact, converge, and convert. However, how do different metaphors of creativity help to model the epistemic ruptures now occurring within and beyond working life?

Three Metaphors of Creativity

Certainly, philosophical discourses—old and new—demonstrate that creativity is by no means a new way of metaphorizing the dynamics of knowledge and learning within a world of change. Rather, what is new is the current situation, a new phase of the global knowledge economy labeled as for example a “wave of creativity and innovations” (Landry, 2000, p. 257), “a creative economy” (Peters, Marginson, & Murphy, 2009, p. 85), or a new “ecology of ideas” (Howkins, 2009, p. 3). Taking the new ways of the world, it is therefore pertinent to explore the ways in which, and to what extent, traditional metaphors of creativity may provide openings (or offer limitations) for our ways of thinking about the altering epistemic cultures now characterizing professional work and learning.

The three metaphors discussed here—“expression,” “production,” and “reconstruction”—see creativity as the *act* of creating something new. Nevertheless, they offer different and somewhat contrasting perspectives on educative experiences, creative acts, and epistemic ruptures. By implication, they will also help to model contemporary workplace learning differently. While mapping their vital characteristics, I will here draw on data material from the ongoing Norwegian study to illustrate that point.

Creativity as Expression

Creativity can be seen as cultural forms of collective self-expression. In contrast to earlier ways of thinking, Johann Gottfried Herder (1744–1803) saw cultural forms as products of human activities, not of a divine action. In fact, he argued that creativity is innate to any form of human practice because of a creative predisposition. In his *Treatise of the origin of language* (1772) Herder rejected the divine origin of human speech, because—as he says—humankind could never have been granted the gift of speech unless they already are predisposed to discover language. Next, the acts of speech, in fact any cultural expression, are closely related to the origin and evolution of society: “A poet is a true creator of the nation around him, he gives them a world to see and has their souls in his hand to lead them to the world” (quoted from Bernard, 1983, p. 234). With his remarkable departure from earlier ways of perceiving creativity as a divine quality only, Herder is seen as the

originator of the *Geisteswissenschaften* (the arts and humanities), which again gave rise to a cultural movement conceptualizing education as *Bildung* (Lovlie & Standish, 2003).

At the heart of the idea of *Bildung* lies the conception of the vitality of human action and the dynamic transformation extending through culture and politics. *Bildung* therefore happens through a double movement, i.e., through our self-activities and through the cultural and political forms of any society. In short, *Bildung* is inseparable from the creative acts of self-activities and the collective self-expressions building social, political, and cultural communities. While creativity is innate in human action, it is mediated through the novelty of each newfound expression and articulated through cultural and political forms. In other words, we are educated concurrently through our self-activities and our social, political, and cultural interactions. Consequently, this way of metaphorizing creativity moves beyond a Kantian notion of the artistic genius giving rise to the fine arts, since the idea of creativity as a special quality for a few individuals is clearly dismissed. By contrast, creativity is here seen as a universal disposition, giving rise to the creative everyday practice of all human beings. Friedrich Schiller (1759–1805), for example, pictures play—*ludere*—as the very dynamic heart of *Bildung* (Schiller, 1794/2004). Friedrich Froebel (1782–1852), the father of the kindergarten movement, recognized the child’s creative self-expression through free play:

Play is the purest, most spiritual activity of man at this stage, and, at the same time, typical of human life as a whole—of the inner hidden natural life in man and all things... play at this time is not trivial, it is highly serious and of deep significance. (Froebel, 1826/1987, § 30)

Froebel, therefore, promoted an education through play, which he saw as the most creative self-activity at this stage of life. However, since he conceived of play as “typical of human life as a whole,” he also paralleled play with the creativity innate to any form of human practice. To nurture the child’s ability to play is therefore to nurture the child’s future ability to create something new. In other words, play and creativity here go hand in hand.

Overall, creativity is here pictured as a collective form of self-expression happening in and through everyday work and play. Taking a somewhat naïve example, the group of Norwegian teachers studied may illustrate the close connection between play, creativity, and workplace learning. For example, when they describe the introduction of smart boards to Norwegian schools as a positive event, bringing “the whole world into the classroom,” and inviting them to play with the new technology in order to improve teaching and learning:

Teacher: Oh yes, there’s a new thing I haven’t tried before, wow—seems interesting, look forward to trying it.

Interviewer: Yes?

Teacher: It’s a new way of teaching, which I haven’t thought of.

Interviewer: Hmm.

Teacher: Overall, there are new ways of teaching all the time, aren’t there? So it’s...you work...so there’s never *one* method. It’s, I mean, the way you work, and it’s never only *one* method. Because you continuously change the way you work.

Describing the smart board as a fun thing, inviting her to play, and trying out new teaching styles in order to “make the instruction interesting and engaging for the students,” this teacher illustrates the fine line between play and work. At first glance, her playful approach to the smart board comes forward as fairly unserious. However, re-reading the whole interview it becomes clear that she is an experienced teacher, valuing her work (“I *do* love being a teacher”), and appreciating the fact that she is now a flexible expert able to interact with the smart board in order to create an engaging learning environment together with her students. The 5 years of working as a teacher have educated her and made her an expert. She now continues to educate herself by trying out new methods. Thus, she obviously enjoys being “educated” again through the new technology introduced to Norwegian classrooms. In short, we may say that, on the one hand, her playfulness appears as unserious. At the same time, though, there is a deep seriousness to her play, since it reveals her expertise, her flexibility, and her willingness and ability to initiate new teaching styles.

In sum, when following the tradition of Herder and education as *Bildung*, creativity is metaphorized as “expression,” which means that it is seen as innate to all human activities and expressed through the cultural and political forms of society. Creativity, the act of creating something new, is thus inherent in all forms of practice, of working life, and of social, political, and cultural forms. On the one hand, education takes the form of self-education through our activities. On the other hand, we are continuously educated through our participation in and interaction with social, political, and cultural forms. Since creativity and play seem to go hand in hand, there is a fine line between play and work, and a deep seriousness to unserious playfulness within and beyond the workplace. Nevertheless, this way of metaphorizing creativity also carries some limitations: Since this metaphor only says that creation actually happens without further portraying the specific dynamics of the playful creation, it does not provide additional openings for our ways of thinking about the altering epistemic cultures now characterizing professional work and learning.

Creativity as Production

The act of creating something new can also be seen as production, meaning the concrete act of bringing forward something quite new into the world through the object-related activities of human labor. This way of metaphorizing creativity thus goes beyond the aesthetic metaphor put forward by the tradition of the German *Geisteswissenschaften*. Karl Marx (1818–1883) critiques Hegel’s metaphysical assumptions, but he recognizes his insight that labor is the essential spirit of human life. Human labor is not only the process of creating values and commodities, but also the manifestation of man’s vital powers:

The outstanding achievement of Hegel’s *Phänomenologie* and of its final outcome, the dialectic of negativity as the moving and generating principle, is thus first that Hegel conceives the self-creation of man as a process, conceives objectification as loss of the object, as alienation and as transcendence of this alienation; that he thus grasps the essence of *labour* and comprehends objective man—true, because real man—as the outcome of man’s *own labour*. (Marx 1844a, XXIII)

In other words, human labor—as the concrete process of creating something new in the world—is a manifestation of human life. We create ourselves through labor. In addition, the driving force—“the moving and generating principle”—is our desire to work, to labor,

to learn, to create, which is generated by the dialectical movement between a loss (alienation) and the process of transcending this loss. A somewhat naïve example is the teacher who seems lost when the new technology is introduced, but through her labor—which is initiated and moved forward by her desire to learn and finding things out—she transcends the loss by creating a new situation; a renewed learning environment for herself and her students. Consequently, the object-related activities of human labor do not only produce values, goods, and the individual self. It also produces a productive and content community:

Let us suppose that we had carried out production as human beings. Each of us would have *in two ways affirmed* himself and the other person. 1) In my *production* I would have objectified my *individuality, its specific character*, and therefore enjoyed not only an individual *manifestation of my life* during the activity, but also when looking at the object I would have the individual pleasure of knowing my personality to be *objective, visible to the senses* and hence a power *beyond all doubt*. 2) In your enjoyment or use of my product I would have the *direct* enjoyment both of being conscious of having satisfied a *human* need by my work, that is, of having objectified *man's* essential nature, and of having thus created an object corresponding to the need of another *man's* essential nature. 3) I would have been for you the *mediator* between you and the species, and therefore would become recognised and felt by you yourself as a completion of your own essential nature and as a necessary part of yourself, and consequently would know myself to be confirmed both in your thought and your love. 4) In the individual expression of my life I would have directly created your expression of your life, and therefore in my individual activity I would have directly *confirmed* and *realised* my true nature, my *human* nature, my *communal nature*. (Marx, 1844b, III)

Marx's utopia, however, comes forward as a grand narrative. In fact, though, this way of metaphorizing creativity has given rise to a great many schools of thought and by implication quite a few—but also different—theories on education and workplace learning: The sociopolitical philosophies of the neo-Marxist Frankfurt school, for example, have promoted educational programs aiming at social critique and reform through a fostering of the child's self-determination, co-determination, and solidarity (i.e. Klafki, 1998). A Hegelian, neo-Marxist philosophy of praxis is apparent in Paulo Freire's (1996) critical pedagogy, which aims at democratic literacy. Furthermore, the neo-Marxist notion of creative transformations of culture and self is clearly evident in the more cognitive oriented learning theories of, for example, Vygotsky (1926/1995), Bruner (1990), or Scandinavian activity theory (i.e., Engeström & Miettinen, 1999). Overall, all these theories on education and workplace learning seem to save creativity from the narrow domain of aesthetics. The notion of creativity here thus goes beyond the vital human compulsion to produce, as creativity is seen as manifest in the concrete object-related activities that brings into being something new in the world.

The creative labor of a group of Norwegian auditors—all affiliated with different workplaces—is an example. They all use a particular software program designed for public auditing. When using the program, they do not only interact with it as a ready-made tool, they also build, develop, expand, and assess the program continuously while using it. The program is now so well-developed, and has reached such a high standard, that it will be exported and used in transnational auditing. Overall, there are several creative products of the labor of these auditors: First, they have participated in developing a sophisticated tool for auditing to be used within and beyond national borders. Next, their daily interaction on the same

software, which they have developed together, has produced a productive community of auditors, reaching across and beyond the local workplaces. These auditors now have a collective experience and expertise that will help to further develop the methods and efficiency of national and transnational auditing procedures. Third, the auditors seem to have acquired a new way of understanding and performing their daily work:

Auditor: Now I want to contribute to growth instead of just assessment and control. I have a different outlook. For example I now look for the difference between effective and non-effecting ways of organizing the auditing procedures.

Interviewer: So you use different knowledge resources than before?

Auditor: No. Not really. But I'm more competent in using the resources. I use the same: The government, the ministries, the national assembly, Norwegian laws and regulations. However, I no longer search for information on how to do things.

Interviewer: No?

Auditor: Because now the methodology is part of *me*. My task now is to develop and renew that methodology.

In brief, following the tradition of Marx, creativity is metaphorized as production. Creativity is associated with the concrete object-related activities of human labor, which brings forward something new into the world. Since creativity is seen as the essential spirit of human life, human labor is not only the process of creating values and commodities, but also the manifestation of human beings' vital powers: We create ourselves through labor. Moreover, the driving force is an innate desire to work, to labor, to learn, or to create. Marx shows how I objectify my individuality through my human labor since I in my production enjoy my life and its visible products. I will also enjoy the fact that you use and enjoy my products. Thus, I will receive recognition when you are recognizing the products of my work. Consequently, in my individual labor, I will confirm and realize my human nature, which is a communal, social nature. By implication, a product of human labor is also a productive and pleasant society, a creative community, or fruitful learning culture.

This way of metaphorizing creativity, education, and workplace learning can therefore help to portray and explore the shifting epistemic cultures of the professions. It may also help to assess the fruitfulness of the new professionalism now attained—is it creative or repetitive? However, since action here equates only one particular form of action, namely the object-related productive labor, this way of metaphorizing creativity seems to invite a theoretic distinction between the local and the global and thus to interpret the intersection of local/global epistemologies as a disturbing event. The preliminary findings of the Norwegian study, however, imply that the ways in which global/local epistemologies interact, converge, and convert carry an “immanent creation,” a “radical otherness,” a “non-trivial novelty” (i.e., Castoriadis, 1987), coming forward, not only as something unforeseen, but also as the *creative* ways of thinking and acting now characterizing professional work and learning.

Creativity as Reconstruction

In contrast to the continental philosophical discourses, American pragmatism metaphorizes creativity as reconstruction in terms of a radical remaking of our *common sense*, which not only promotes a reorientation, but also contributes to deep-seated transformations that restructure and remake our worldviews, experiences, and habits of thought and action. The creative act is here seen as a reconstruction that affects our ways of seeing the world, our ways of making the world, and, by implication, the ways of the world themselves. The focus here is not so much the human consciousness, but rather the *act* of creation.

In his remarkable theory of signs, Charles Sanders Peirce (1839–1914) depicts this action as “*semeiosis*”: “By *semeiosis* I mean, an action, or influence, which is, or involves, a cooperation of *three* subjects, such as a sign, its object, and its interpretant, this tri-relative influence not being in any way resolvable into actions between pairs” (Peirce, 1907/1998, p. 411). In short, the act of creation is in signs, or rather in the flows of signs, which come forward as a “series of surprises,” i.e., one novelty after another that “presses upon every one of us daily and hourly.” *Semeiosis* thus educates:

In all the works of pedagogy that ever I read—and that have been many, big, and heavy—I don’t remember that any one has advocated a system of teaching by practical jokes, mostly cruel. That, however, describes the method of our great teacher, Experience. She says:

Open your mouth and shut your eyes
And I’ll give you something to make wise;
And thereupon she keeps her promise, and seems to take her pay in the fun of tormenting us. (Peirce, 1903/1998, p. 154)

Peirce here quotes a folklore children’s rhyme, cited when giving the child a gift of sweets. He thus implies that a practical joke is a sweet thing because it conveys learning. This happens because of—as he says—“the action of experience.” *Experience* here denotes *semeiosis*, meaning the flows of signs mediating actual lived experiences and our ways of seeing and perceiving the world, thus producing “a series of surprises”: “The phenomenon of surprise in itself is highly instructive. . . because of the emphasis it puts upon a mode of consciousness which can be detected in all perception, namely, a double consciousness at once of an *ego* and a *non-ego*, directly acting upon each other” (Peirce, 1903/1998, p. 154). In short, experience teaches through its abrupt entrance that bewilders familiar ways of thinking. These moments of surprise, which indeed jumble our categories of thought, happen because of a double consciousness, which, on the one hand, is aware of the familiar and vivid representations *and*, on the other hand, is aware of the new and unexpected. Consequently, the surprise is not so much in the abrupt and unexpected experience itself. The surprise is rather in the *relationship* between the known and the unknown, between familiar ways of thinking, and something totally new and unexpected, or between the “expected idea” and the “strange intruder.”

In the Norwegian study, the group of Norwegian nurses portrays the short-lived qualities of a professional field of “fast knowledge.” One of the nurses says:

Nurse: I’m constantly searching for new research results. So accessing the net, searching databases, updating our knowledge, and validating the flow of information, that’s part of our daily routine. And we change our

procedures according to the new information. Only since last year, we've changed a lot. . .

Interviewer: Yes

Nurse: . . .because we constantly learn about new research results, new ways of doing things, or new procedures implemented at another department—'should we try that?'

Interviewer: Hmm. Will you describe yourself as a participant or a bystander to these fast-moving changes?

Nurse: Both [laughter]

Interviewer: Yes?

Nurse: You're. . .you're mostly a bystander, but also a participant. For example, a colleague of mine now studies post-operative procedures for patients on heart-lung machines. To his research, which is part of his doctorate, I am a passive bystander. At the same time I have a lot of expertise within that particular area. I'm actually the one doing the labour. And I'm very interested. So I report to him, so therefore. . . I mean . . . that's only one example on how you're always concurrently a participant and a bystander.

This nurse depicts the acts of creation through semeiosis, the flows of signs, which are mediated through the "double consciousness—at once of an ego and a non-ego—directly acting upon each other" (Peirce, 1903/1998, p. 154). When she portrays herself as concurrently an observer to and a participant in the fast-moving changes now happening, she describes her "double consciousness": On the one hand, she recognizes the amount and quality of the research work carried out within her field, on the other hand, she acknowledges her own labor and expertise. In other words, she simultaneously keeps an eye on the "non-ego" (the flows of information) and the "ego" (her expertise). These "acts of creation"—constituted through her double consciousness—happen continuously, for example, when she searches the net, discusses with her professional team, attends lectures, gets to learn about different routines carried out at other hospitals, or when she interacts with her patients. In sum, when reading this interview in light of Peirce's theory of signs, it helps to illustrate how the shifts within contemporary work life are closely related to the ways in which global/local epistemologies unavoidably interact, converge, convert, and offer new instruments of knowing, acting, and constructing the world of objects. However, it is not yet clear how this way of metaphorizing creativity may help to portray the *creative* ways of thinking and acting now characterizing professional work and learning.

Peirce's theory of signs shows a metaphysical realism of a unique kind. To him, the creative "action of experience" is a mediated experience, a flow of dynamic sign systems that acts upon us and thus contributes to a *continuous* reconstruction of both our ways of being in the world and the world itself. However, Peirce also perceives creativity as a *discontinuous* reconstruction. The discontinuous creativity comes forth as spontaneity, a series of guesses, or a play of chance that promotes radical epistemic ruptures. This dynamic occurs through, as he says, abduction or abductive guesses. Peirce describes abduction as an

intersubjective creation of new ideas, which he saw as the only kind of reasoning that could generate genuinely new ideas. Abduction appears when we are confronted with a surprise, observe something out of the ordinary, or experience an odd event that bewilders and jumbles our earlier categories of thought. For example, when taught by “practical jokes, mostly cruel,” when being confronted with an impossible task at the workplace, or realizing that one’s competency is outdated. Again, the bewilderment is not so much in the surprise itself, but rather in the relation between familiar ways of thinking and the totally new and unexpected. Since it is generated by this impossible contrast between our ways of seeing the world and how it actually appears, the purpose of our abductive reasoning is to put forward a somewhat reasonable assumption or working hypothesis, which we later use, test, and act upon in order to attain a plausible assumption: “Abduction is where we find some very curious circumstance, which would be explained by the supposition that it was a case of a general rule and thereupon adopt the supposition” (Peirce, 1904/1998, p. 227). The abductive process can thus be described as a series of guesses in order to eventually reach at a plausible hypothesis, which we next assess by its explanatory power. Our intention is simply to make a working assertion, which we can use to act or test or investigate further, and thus to change the *meaning* of the world. Hence, the product is in fact a creation of something genuinely new (Anderson, 1987; Garrison, 2005; Kvelson, 1998; Liszka, 1996; Paavola & Hakkarainen, 2005).

The interviews with the Norwegian nurses indicate that abductive reasoning is integrated in their ways of thinking and acting. When describing their work, the nurses in this group use the term “evidence-based practice.” They portray an epistemic culture that can be paralleled with the cultures found within professional research groups, based on a shared interest of inquiry within a specialized field of knowledge. Furthermore, they describe an epistemic practice characterized by highly developed and consistent routines for a systematic inquiry, for sharing their expertise, developing and updating their procedures, and for an uninterrupted and systematic validation of their labor, their disciplined inquiry, and their ways of evaluation. When describing the epistemic culture and the epistemic forms of practice, they seem to have adopted the rhetoric of research, not only speaking of an “evidence-based practice,” but also of “systematic investigation,” “the research frontier,” and “research tools.” Overall, the group of nurses portrays an epistemic culture generated by the urgency of their work, based on a common research interest, and carried out through a highly specialized and orderly set of systematic routines. When one of the interviewees was asked “what if you make a mistake?” she promptly responded: “No, no. No, I can never make a mistake. If I do, the patient will die.”

Nevertheless, these nurses seem to have integrated an abductive way of reasoning. In some of the interviews, the interviewees describe how this way of reasoning happens when they are confronted with a surprise, observe something abnormal, or experience an odd event that bewilders and jumbles their habits of thought and action. Here are two examples: One nurse described how she was caught by surprise when learning about another hospital using sterile water when tube-feeding the patients. Another nurse describes how, when scrolling through some newly published articles on how the body reacts to a lower temperature, she was taken by surprise with the idea that they could cool down the premature babies in order to save their lives. Both nurses emotionally described the event of catching a new idea on how they could contribute to save more lives. However, even more interesting is how both ideas gave birth to systematic research on their workplace in order to first find out if their ideas were reasonable, and next if they were possible to put into practice. Both nurses said they spent a lot of time—by themselves in front of the computer and with their team, in

workshops and meetings—in order to develop and test the idea. The first nurse confirmed that they now have changed their routines on tube feeding. The second nurse, however, regrets that they were still not able to practice such a procedure, because “we need bags of a particular type of plastic that does not hurt the babies, and such bags are not yet available.” Despite intense research, her team still doubted how the cooling down of such premature babies would affect the babies’ blood values: “we need more knowledge, but might be able to implement such a procedure before long. . . .”

These examples illustrate remarkable outcomes of the interweaving of the continuous and discontinuous creativity, and thus how baffling moments of something inexplicable can be integrated in and give birth to new ways of thinking and acting. The nurses’ ways of integrating the *discontinuous* ruptures that gave birth to their ideas in a *continuous* reconstruction of their epistemic forms of practice demonstrate how discontinuous and continuous forms of creativity play together in the reconstruction of our ways of being in the world and of the world itself. The impulse, the radical rupture, the spontaneity should thus be highly affirmed since it is the only way of creating new ideas. However, radical new ideas need to be integrated in and validated by our *common sense* since we uninterruptedly come up with new ideas, but just a few of them seems feasible. In other words, discontinuous creativity needs to go hand in hand with continuous creativity in the generation of new intelligible components of reality.

The Work of Metaphors

Overall, these three ways of metaphorizing creativity may help to illuminate our ways of conceptualizing workplace learning within the new era in that all three metaphors picture creativity as the *act* of creating something new. Nevertheless, they offer somewhat contrasting perspectives on educative experiences, creative acts, and epistemic ruptures, and will, by implication, help to model contemporary workplace learning quite differently. So, what do they invite us to see and not to see?

The philosophical discourse metaphorizing creativity as *expression* pictures creativity as a universal disposition, innate to all human activities, and expressed through the cultural and political forms of society. Creativity is the dynamic vitality of all forms of human practice—it drives our working life and is immanent in any social, political, and cultural form. Creativity is therefore also at the very dynamic heart of educational processes, including workplace learning. Education takes the form of self-education through our activities while simultaneously we are continuously being educated through our participation in and interaction with social, political, and cultural forms. Since creativity and play seem to complement each other, there is a fine line between play and work, and a deep seriousness to unserious playfulness within and beyond the workplace. Nevertheless, this metaphor carries some limitations since this way of metaphorizing creativity only says that creation actually happens without further portraying the specific dynamics of the playful creation.

The philosophical discourse metaphorizing creativity as *production* sees creativity as manifest in the concrete object-related activities of human labor, which brings forward something new into the world. Since creativity is here seen as the essential spirit of human life, human labor is not only the process of creating values and commodities, but also the manifestation of human beings’ vital powers: We create ourselves through labor with an innate desire to work, to labor, to learn, or to create as a driving force. I objectify my individuality through my labor since I, in my production, enjoy both my work and its visible products. I

will also enjoy the fact that you use and enjoy my products. Thus, I will receive recognition when you are recognizing the products of my work. Consequently, in my individual labor, I confirm and realize my human nature, which is a communal, social nature. By implication, a product of human labor is also a productive society, a creative community, or fruitful learning culture. This way of metaphorizing creativity can therefore help to explore and assess the epistemic shifts now appearing. Are they creative or repetitive? However, since action here equates only one particular form of action, namely the concrete object-related productive labor, this way of metaphorizing creativity may invite a theoretic distinction between the local and the global.

The philosophical discourse of metaphorizing creativity as *reconstruction*, however, represents a shift of focus from the human consciousness to the *act* of creation, which is here portrayed as a deep-seated reconstruction that affects our ways of seeing the world, our ways of making the world, and, by implication, the ways of the world themselves. Here, continuous and discontinuous forms of creativity play together in the reconstruction of reality. More specifically, creative action is portrayed as a mediated experience, a flow of dynamic sign systems that acts upon us, contributing to a *continuous* reconstruction of both our ways of being in the world and the world itself. Conversely, creativity is seen as a *discontinuous* reconstruction that comes forward as a series of guesses or play of chance promoting radical epistemic ruptures. This kind of creativity appears when we are confronted with a surprise, observe something out of the ordinary, or experience an odd event that jumbles our earlier categories of thought. The purpose is simply to put forward a somewhat reasonable assumption or working hypothesis, which we later use, test, and act upon in order to arrive at a plausible assumption. This metaphor may thus help to illustrate how the epistemic shifts within contemporary work life are closely related to the ways in which global/local epistemologies unavoidably interact, converge, convert, and offer new instruments of knowing, acting, and constructing the world of objects. In addition, it helps to portray the *creative ways* of contemporary professional work and learning.

Taken together, the three metaphors offer a thick description on the epistemic ruptures now happening within and beyond working life. Nevertheless, the third metaphor seems to be the only metaphor carrying a rich potential for embracing the ways in which global/local epistemologies now unavoidably interact, converge, and convert. It thus opens possibilities for conceptualizing the shifts within contemporary work life as *creative* shifts generated by and parallel to the extraordinary newness of the phase of the global knowledge economy we are now experiencing.

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