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ACTIVITY-THEORETICAL AND SOCIOCULTURAL APPROACHES TO LEARNING AND COLLECTIVE CREATIVITY: AN INTRODUCTION

Annalisa Sannino and Viv Ellis

In the social sciences, the topics of learning and creativity have been widely but separately explored. The relation between learning and creativity is still poorly understood, especially when creativity is taken in a collective sense. Creativity has been primarily conceptualized as the quality of an innovative individual or as a novel outcome of individual action. In both these cases, creativity exists as a mental property. Such a view disregards the collective processes of creation, the learning involved in those processes, and their foundational role in cultivating creative minds as well as in producing creative outcomes of societal relevance.

Historically, the domain of creativity research has emphasized the lives and achievements of remarkable individual human beings, leading to perspectives according to which "without the exceptional individual, there is no creative work" (Solomon, Powell, & Gardner, 1999, p. 282). Within such perspectives creativity is defined as

cognitive processes and overt behaviors that result in new ideas, products or performances and that are judged by some audience to be new, original, useful and/or aesthetically pleasing. . . . Ultimately it is thinking that yields new ideas and new productions that come to be

accepted by some audience or constituents. (Feldhusen, 1999, p. 777)

In recent years, however, some authors have focused attention on mundane, collective, and collaborative aspects of creativity (e.g., John-Steiner, 2000; Sawyer, 2012a, 2012b). More inquiries are needed to take into account the tremendous potential of the often unnoticed but continuous work of anonymous collectives, who on a daily basis build thick textures of innovation and change in many constantly transforming practices. When change or transformation are addressed in creativity research, they tend to be primarily conceived as something spectacular or even "legendary" (Kaufman & Beghetto, 2009), something that radically transforms an entire field of endeavor, that changes the world (Feldman, Csikszentmihalyi, & Gardner, 1994).

Predominant lines of research on learning do not include creativity as a central element of their research agendas. Those who have gone beyond the individualist paradigm of creativity have not focused on the relation between creativity and learning. Bringing creativity (as a collective and cultural phenomenon) and learning together opens up a dialogue between two fields of research that have remained separate, even though often tantalizingly close. Examples of such bridging attempts are the proposals for a "systems" or "field" view of creativity (Sternberg, 1988; Sternberg & Lubart, 1999) or for intermediate concepts such as "little c" and "Pro-c" creativity (Craft, 2005; Kaufman & Beghetto, 2009).

Over the last decade, especially, there has been increasing attention by researchers to learning and creativity in school settings (Craft, 2005; Loveless, 2003; Sawyer, 2011; Sefton-Green, Thomson, Jones, & Breslin, 2011), where learning is often bounded to relatively well-stabilized knowledge codified in a formal curriculum. This volume puts creativity and learning in the

context of diverse human activities and innovations beyond the limits of schooling. Recently some similar initiatives have appeared, calling for studies of creativity in diverse social contexts. Rickards and De Cock (2009) and Littleton, Taylor, and Eteläpelto (2012), for instance, take a wide perspective on creativity and development within organizations and professional domains.

Activity theory and sociocultural studies can contribute to a novel conceptualization of learning and collective creativity along these lines by revitalizing the Vygotskian tradition on art and imagination. Connery, John-Steiner, and Marjanovic-Shane (2010) take a step in this direction, offering an interesting discussion of Vygotsky's ideas on creativity and imagination, particularly in relation to adolescent development. Although they discuss creativity mainly from the perspective of aesthetic education, with a special focus on school settings, Connery, John-Steiner, and Marjanovic-Shane's work makes an important contribution in identifying the affective and relational dimensions of creativity and its social organization.

This volume brings together leading representatives of activity-theoretically and socioculturally oriented research from different parts of the world, to discuss creativity as a collective endeavor strongly related to learning, poised to face the societal challenges of our world. A common inspirational source of the authors in this endeavor is the work of Lev Vygotsky on creativity, art, and imagination.

<A>CREATIVITY: VYGOTSKY ON ART AND IMAGINATION

The Psychology of Art (1971) is one of Vygotsky's key texts on these themes, comprising the results of his early inquiries during the years from 1915 to 1922 (Leont'ev, 1971). Even though

Vygotsky received a contract for the publication by the Leningrad State Editions in 1925

(Vygodskaia & Lifanova, 1996), the book remained unpublished during the author's lifetime.

In the introduction to *The Psychology of Art*, Leont'ev (1971) writes:

When he [Vygotsky] had finished his work on the manuscript [*The Psychology of Art*], he had

already become aware of the potentialities of a new direction in the scene of psychology, to

which he attributed a very great, even decisive, importance for understanding the mechanisms

of artistic creativity and the specific functions of art. He was compelled to follow this

direction in order to complete his work on the psychology of art and prove what still remained

unproven. (pp. ix–x)

For Sobkin and Leontiev (1992), "Vygotsky's *Psychology of Art* is essential to an

understanding of the evolution of his theoretical approach. It influenced profoundly not only his

own research, but also that of his colleagues, disciples and present-day followers" (p. 190).

Although Vygotsky never comprehensively returned to the thesis presented in *The Psychology of

Art,* it is significant that the themes of creativity, imagination, and art consistently reappear

throughout his writings in later years (Vygotsky, 1997a, 1998, 1999, 2004). It is the emphasis on

these themes that makes Vygotsky's psychological project so distinctive.

For Vygotsky, creativity was a complex dialectical process of historical production and

reproduction of artistic creation. From the very beginning, efforts to create and recreate have

been made by human beings to keep their lives and societies functioning. Works of art are

crystallizations of human creative activities into material objects and of new knowledge which

becomes instrumental for future generations. Vygotsky (1971) saw art as "one of the vital

functions of society, intimately connected with all the other spheres of social life in its material-historical state" (p.10). This view of art and creativity was to be taken up in the late twentieth century by cultural studies scholars who argued, like Vygotsky, that it was "the fact of creativity in all our living" that "ratified" intentionally aesthetic or artistic productions (Williams, 1965, p. 34).

The vital societal function of art was explicated by Vygotsky (1971) in connection to emotions: "Art systematizes a very special sphere in the psyche of social man—his emotions" (p. 13). According to Vygotsky (1997a), "Art does not just provide an outlet and expression for a particular emotion, it always resolves this emotion and liberates the psyche from its somber influence" (p. 267). Creative activities are therefore both liberating and empowering. Throughout creative production, human beings liberate themselves from *and* gain control of their straightforward reactions and emotions (for a discussion of *The Psychology of Art* with a special focus on emotions, see Smagorinsky, 2011).

Vygotsky's thesis in *The Psychology of Art* (1971) and in his other works on creativity (Vygotsky, 1997a, 1998, 1999, 2004) can today serve as a springboard for much needed discussions about and elaborations of the essence, processes, and potentials of creative production. The arts are the domain in which such creative production discloses itself with the most accentuated traits, but in fact to some degree, all domains of life are concerned with creative processes:

Any human act that gives rise to something new is referred to as a creative act, regardless of whether what is created is a physical object or some mental or emotional construct that lives within the person who created it and is known only to him (Vygotsky, 2004, p. 7).

The dynamics of artistic creativity can therefore serve as a window to understand creativity at large. Testing the insights stemming from Vygotsky's *The Psychology of Art* (1971) and expressed in his works on creativity (1997a, 1998, 1999, 2004) in contexts of life outside the arts can be particularly fruitful in today's world in which

creativity becomes a necessary tool for survival for contemporary workers, enabling them to be flexible and entrepreneurial, inside and outside organizations, to re-shape their work identities, negotiate uncertain career pathways and generally manage unpredictable situations, including the precarious circumstances of the knowledge economy. (Littleton, Taylor, & Eteläpelto, 2012, p. 1)

In the following extract from *Educational Psychology*, Vygotsky (1997a) elaborates a view of the centrality of creativity to human existence that echoes the early emphasis in Marx (1937) on the potential of creative human agency to disrupt oppressive social structures:

Beauty has to be converted from a rare and festive thing into a demand of everyday existence—and creative effort has to nourish every movement, every utterance, every smile of the child's. Potebnya put it quite elegantly when he said that, just as electricity is present not only when there are thunderstorms, so is poetry present not only where there are works of art, but wherever man speaks. This is the poetry "of every moment", and it is this which is the most important of all the tasks of esthetic education. [. . .] The rule to follow here is not the embellishment of life, but the creative reworking of reality, a processing of things and the

movements of things which will illuminate and elevate everyday experience to the level of the creative. (Vygotsky, 1997a, p. 261)

Vygotsky's conceptualization of creativity as a distinctively human capacity was developed in his later discussions of creativity in childhood, adolescence, and adulthood (Vygotsky, 1998, 2004). Collective creativity is presented in this extract from "Imagination and Creativity in Childhood" as the locus for just that distinctively human capacity:

When we consider the phenomenon of collective creativity, which combines all these drops of individual creativity that frequently are insignificant in themselves, we readily understand what an enormous percentage of what has been created by humanity is a product of the anonymous collective creative work of unknown inventors. [. . .] A scientific understanding of this phenomenon thus compels us to consider creativity as the rule rather than the exception. (Vygotsky, 2004, p. 10–11)

One of the key dynamics of artistic creation presented by Vygotsky in *The Psychology of Art* (1971) is catharsis—that is, the transfiguration of matter and emotions and their transcendence from the individual to the social. This process crystallizes in the materiality of the product of a creative effort. When the product of a creative effort becomes the object of an activity, it can cross the boundaries of the local circumstances in which it was created and can potentially acquire historical and societal relevance. The way in which the essence of creative activities crystallizes in the object of human work is of great importance also for understanding and promoting learning. "Creativity as a tool for survival" in today's world, to recall the expression

used in the quotation above from Littleton, Taylor, and Eteläpelto (2012, p. 1), becomes a process in which individuals learn to face the conflicts in their lives and to deal with the historical contradictions of their time by focusing on their objects and on redesigning their futures.

Imagination plays a crucial role in creative activities that are seen as a means to shape human learning, to influence history, and to redesign the future. As Vygotsky pointed out, "absolutely everything around us that was created by the hand of man, the entire world of human culture, as distinct from the world of nature, all this is the product of human imagination and of creation based on this imagination" (Vygotsky, 2004, p. 9–10).

Vygotsky explicitly referred to imagination as the crucial function that turns creative activities into empowering history-making processes across the past, the present, and the future.

Vygotsky characterized the materialization of what has been imagined as an essential step for a creative effort to be able to have a concrete influence:

A construct of fantasy may represent something substantially new, never encountered before in human experience and without correspondence to any object that actually exists in reality; however, once it has been externally embodied, that is, has been given material form, this crystallized imagination that has become an object begins to actually exist in the real world, to affect other things. In this way imagination becomes reality. (Vygotsky, 2004, p. 21)

At the end of *The Psychology of Art,* Vygotsky strongly emphasizes the future-orientation of artistic creation:

The view that art returns us to atavism rather than projecting us into the future is erroneous. [.

. .] Art is the organization of our future behavior. It is a requirement that may never be

fulfilled but that forces us to strive beyond our life toward all that lies beyond it. (p. 253)

Future-orientation is a key element of recent developments of the Vygotskian legacy, in

particular in activity-theoretical concepts related to the theory of expansive learning (Engeström,

1987). In the next section, we turn to some key concepts in sociocultural and activity-theoretical

research that are taken up in the chapters that follow.

The continuity between *The Psychology of Art* and other more influential works by

Vygotsky—and his followers—is particularly apparent in the emphasis on the need for new

methodological instruments in psychology. In *The Psychology of Art,* Vygotsky refers to the

necessity for the psychologist "of actually creating the object of his study by means of indirect,

that is, analytic methods" (Vygotsky, 1971, p. 23). The indirect method is a key and foundational

theme in Vygotsky's works, notably developed in *The Historical Meaning of the Crisis in*

Psychology (Vygotsky, 1997b)*,* completed in 1926, soon after *The Psychology of Art.*

In *The Historical Meaning of the Crisis in Psychology,* Vygotsky formulated a program for

studying human practices that requires the application of an indirect method. The indirect

method is a dialectical method of inquiry aimed at uncovering the complexity of reality, which is

not immediately accessible with the help of traditional empirical methods. The indirect method

proceeds by reconstructing or recreating the object of study through interpretation of its traces

and influences (Vygotsky, 1997b, p. 272). In the past 20 years, a number of intervention methods

to promote change in work and educational practices have been developed within activity theory

inspired by this notion of indirect method (Sannino & Sutter, 2011). The intervention methods of the studies in this volume are examples of the application of this notion of indirect method.

<A>LEARNING: SOME IMPORTANT SOCIOCULTURAL AND ACTIVITY-THEORETICAL CONCEPTS

The brief introductions to key concepts below are offered as a guide to readers of this volume who may not be familiar with the perspectives taken by the authors of the chapters that follow. These concepts potentially offer a vocabulary for expanding creativity research so as to disclose the relationship between collective creativity and learning.

<B>Zone of Proximal Development

The zone of proximal development is one of the most known concepts derived from Vygotsky's work, usually referenced to the collection of papers published as *Mind in Society* in 1978 (Vygotsky, 1978). Vygotsky defines the zone of proximal development as:

> the distance between the actual developmental level as determined by problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (Vygotsky, 1978, p. 86)

From this definition, the distance between these levels is the "zone" or social space within which human development can be stimulated through collaboration. It was this distance that, for Vygotsky, constituted a more reliable and holistic assessment of the child's development than the

single measurement of an outcome. Vygotsky pointed out also that "with collaboration, direction, or some kind of help the child is always able to do more and solve more difficult tasks than he can independently" (Vygotsky, 1978, p. 209). In these texts, Vygotsky's interest was in development (rather than in the learning of specific skills or concepts) and in collaboration within collective, social situations (rather than prioritizing the influence of an expert or instructor). But whereas Vygotsky's emphasis was on the development of the individual child in his or her social situation, more recent extensions of Vygotsky's ideas (Engeström, 1987) have emphasized the development of the collective and the role of education in leading that development. These recent advances in sociocultural and activity theory have led to methodological innovations discussed in the chapters of this volume that demonstrate the potential of educational or formative interventions in collective activities through the creation of zones of proximal development.

<B>Object

A. N. Leont'ev, Vygotsky's student and colleague, shifted analytic focus in studying human development from the individual to the collective. Leont'ev distinguished between the automatic *operations* of the individual subject, the individual's or group's goal-oriented *actions,* and the level of *activity* that was given cultural and historical meaning and significance by a shared object—its object-orientedness. Leont'ev's interest was in human activity, and he was a major contributor to the Soviet line of activity theory, arguing that, as Stetsenko puts it, "human psychological processes . . . are object-related in opposition to conceptualizing them as a solipsistic mental realm" (Stetsenko, 2005, p. 75). For Leont'ev, the object of activity was actually its "object-motive," and he explained it as follows:

The main thing which distinguishes one activity from another, however, is the difference in their objects. It is exactly the object of an activity that gives it a predetermined direction. According to the terminology I have proposed, the object of the activity is its true motive. (Leont'ev, 1978, p. 62)

The importance of the object in activity theory derives from the interrelatedness of the two concepts, object and activity. Following Leont'ev, culturally or societally significant practices that have historically been undertaken by collectives and have a potentially shared object may be defined as activities. The object is both what engages and motivates the intentional participation of groups of people and what is fashioned and potentially transformed through their participation. As Kaptelinin points out, "the object of activity has a dual status; it is both a projection of the human mind onto the objective world and a projection of the world onto human mind" (Kaptelinin, 2005, p. 5). For researchers, as Kaptelinin also suggests, "the object of activity is a promising analytic tool providing the possibility of understanding not only what people are doing, but also why they are doing it" (Kaptelinin, 2005, p. 5).

This engagement of subjects by an object is what is referred to as object-orientation or object-relatedness. Object-orientation is a dialectical relationship through which both the subjects and the activity change. Davydov, Zinchenko, and Talyzina (1983) point out that "human activity is always directed towards the transformation of an object that is able to satisfy some specific need" (p. 32).

<B>Expansive Learning

Expansive learning is essentially learning something that is not yet there. This goes beyond the acquisition of already well-established sets of knowledge and the participation in relatively stable practices. This is a creative type of learning in which learners join their forces to literally create something new. The metaphor of expansion depicts the multidirectional movement of learners constructing and implementing a new, wider, and more complex object for their activity. In expansive learning, the object of the activity is reconceptualized and transformed with the help of the mediating means employed and built throughout the process.

The theory of expansive learning is epistemologically grounded in the dialectics of ascending from the abstract to the concrete (Davydov, 1990; Il'enkov, 1977). At the beginning of a process of expansive learning, the object is only abstractly mastered as a partial entity, separated from the functionally interconnected system of the collective activity. By ascending to the concrete, an abstract object is progressively cultivated into concrete systemic manifestations and transformed into a material object that resonates with the needs of other human beings as well. These phases often require the subject to struggle and break out of previously acquired conceptions in conflict with new emerging ones (Sannino, 2010). This process opens up multiple possibilities for the learner to creatively experiment with new solutions and innovative ideas.

Expansive learning manifests itself in changes in the object of an activity. This can lead to qualitative transformations both at the level of individual actions and at the level of the collective activity and its broader context (Engeström & Sannino, 2010, p. 8). When human beings pursue and grasp the object of their activities, their long-term devoted engagement with the object can not only fulfill their lives, it can also have a significant societal impact.

<B>Activity System

From the perspective of activity theory, the prime unit of analysis is the activity system. The model of an activity system is a representation of the social and historical organization of the concept of "object-orientated, collective, and culturally-mediated human activity" (Engeström & Miettinen, 1999, p. 9). "Culturally-mediated" refers to the role of artifacts—semiotic and material—in the participating subjects' joint work on the object of their activity. The basic components of an activity system, therefore, include the subject, the object, mediating artifacts, the rules of participation, the specific community, and the division of labor among participants (Engeström, 1987).

Modeling the activity system in interventionist efforts reveals the potential of the internal tensions and contradictions as motives for change and transformation. And, as participants are never in the subject position in only one activity system at any one time, their participation in multiple and intersecting activity systems increases the potential for generative contradictions to be experienced, surfaced, and examined both between and within activity systems. The relationship between multiple activity systems and their outcomes (and their multiple perspectives and voices) is presented as the foundation of what is known as the "third generation" of activity theory (Engeström, 1996).

<B>Double Stimulation

Vygotsky's search for new methodological instruments led him to elaborate what he referred to as the principle of double stimulation (Vygotsky, 1987, 1997c). His aim in undertaking this approach to experimental methods in psychology was to challenge the researcher to see psychological processes as dynamic and historical, "undertaking changes right before one's eyes" (Vygotsky, 1978, p. 61). Appropriating the language of behaviorism, Vygotsky described

the researcher-set problem as the "stimulus-end" and the potentially helpful tools as the "stimulus-means" or "auxiliary means." By studying the ways in which subjects appropriate these tools in their work on the problem—the object of their activity—Vygotsky argued that it was possible to reveal the ways in which those subjects made sense of the worlds they were acting in:

> We simultaneously offer a second series of stimuli that have a special function. In this way, we are able to study the process of accomplishing a task by aid of the specific auxiliary means: Thus we are able to discover the inner structure and development of higher mental processes. (Vygotsky, 1978, p. 74)

In recent activity-theoretical research, double stimulation is at the core of intervention methods such as the Change Laboratories (Engeström, 2007; Sannino, 2011). In a Change Laboratory intervention, the "auxiliary means" is often a model of the activity system, represented diagrammatically and used with participants in a joint analysis of data generated from the current practices.

<B>Contradictions

In an activity-theoretical analysis of change, the concept of contradiction is of great importance. Although sometimes sociocultural and other analyses refer to "tensions" much more loosely, contradictions in activity-theoretical terms are not only personally experienced, ontological dilemmas but also systemic and structural constraints that need to be overcome and broken away from in order for human agency to be exercised and new forms of activity to emerge. The

importance of contradiction as a concept reveals the influence of Marxian historical analysis in the elaboration of activity theory. Vygotsky's analysis of human development draws on Marx's (e.g., Marx & Engels, 1964) dialectical materialism and understanding of historical change as the sublation of simultaneously ideal and material oppositions by a synthesis that both supersedes and contains them.

Engeström's theory of expansive learning (1987) poses contradictions as the generators of change in the development of activity systems. Historically new forms of activity emerge when internal contradictions within the activity system are resolved. Participants in activity systems, upon recognizing the constraints of their situation (sometimes expressed as a "double-bind" or a situation characterized by conflicting demands), appropriate available cultural tools in order to break away from that situation and to transform it. Engeström (1987) identified four types of contradictions within activity systems beginning with the primary contradiction (under capitalist conditions) between use value and exchange value, most importantly with reference to the shared object. Secondary contradictions emerge between components of the activity system. Tertiary contradictions arise from the introduction of qualitatively new forms of the activity that are resisted by deep-seated old dynamics in the system. And quaternary contradictions emerge between interacting activity systems that need to reorganize their relations.

The Russian philosopher Il'enkov noted that historically new modes of action and production, "before becoming generally accepted and recognized, first emerge[s] as a certain deviation from previously accepted and codified norms" (Il'enkov, 1982, pp. 83–84). Such historically new forms of activity across various social worlds, emerging as Il'enkov suggested out of contradictions, as exceptions from the rule, may be regarded as history-making creative endeavors.

<A>THE THEMATIC STRUCTURE AND CHAPTERS OF THE BOOK

This book proposes to see learning and collective creativity as foundationally intertwined processes. Such a view opens up new vistas for the study of cognition and human activity in the following three ways, which correspond to the three parts of the book.

Part 1: Creative collective endeavors are pathbreakers of new learning that involve clashes with historically stabilized knowledge and traditions.

Karin Johansson takes up the pressures in contemporary global societies that bring musicians to constantly face new learning challenges to develop the meaning of their music and ways to create favorable conditions to perform it. Professional music making is becoming an increasingly fragile domain due to pervasive insecurity and unpredictable economic developments. In these circumstances, creativity and learning become a necessity for reaching innovative outcomes. Yet the shaping and transformation of artistic musical activities is often constrained by the burden of centuries-old traditions and consolidated collective knowledge. Innovative initiatives in the domains of music usually clash with conservative institutional orientations worshiping cultural preservation and craftsmanship transmission.

The activity-theoretical analysis undertaken by Johansson articulates the historically layered complexity of learning and collective creativity in two empirical cases of instrumental tuition of vocal students and professional organ improvisation. The chapter illustrates how engagement with historical tensions shapes collective creativity and learning that challenge established norms

and promote new modes of musical expression and the exploration of new ways of knowing.

Annalisa Sannino examines critical transitions toward creative production of culture as foundational steps in learning to create. The critical transition to creative writing in the biography of the French existentialist writer Simone de Beauvoir is used as an example to highlight the role of personal and societal struggles in processes of creation and learning. These struggles are undertaken because charting new terrains of knowledge requires positioning within an intellectual landscape in a given culture and in specific historical circumstances, often hostile toward the new.

De Beauvoir's transition from her successful years as a student to the difficult 10 years after her graduation, filled with unsuccessful attempts to publish her first book, illustrates how the process of creation and learning can take the shape of a prolonged struggle with and breaking away from oppressive boundaries of the dominant intellectual culture. The analysis shows how such struggles are essential aspects of transitions toward the creation of something genuinely novel. Such transitions are depicted as journeys along hostile, unpaved paths and toward directions that are only vaguely perceptible at the beginning.

Katsuhiro Yamazumi presents a case of intervention research in a Japanese school aimed at challenging the typical separation of educational institutions from direct societal influence and collaboration. In partnership with local farmers, experts, volunteering citizens, and a governmental agency, the school in the longitudinal intervention became involved in hybrid educational activities for the revitalization of a local plant, traditionally consumed as a vegetable, but brought to the verge of extinction with increasing urbanization. Collective learning and

creative efforts by the multiple parties involved led to innovative outcomes of societal relevance for the local communities.

With the help of this example, the author emphasizes that learning and collective creativity in school settings require going beyond traditional methods of teaching and learning that primarily focus on cultural transmission and preservation. Instead, learning and collective creativity are at play when schools engage themselves in processes of cultural creation and transformation that transcend the school's institutional boundaries and respond to pressing societal needs.

Kai Hakkarainen, Kaisa Hytönen, Juho Makkonen, Pirita Seitamaa-Hakkarainen, and *Hal White* address the challenge of contemporary universities to educate doctoral students in knowledge-creating practices resulting in high-level academic productivity. The authors focus in particular on the collective creativity of academic research, using the case of the adoption by educational sciences of the article-based approach to doctoral education previously typical to natural sciences. Based on interviews with leading European scientists, the study highlights the role of cultures and communities as key factors contributing to creativity. Creativity is described as a systemic phenomenon emerging routinely in the shared knowledge practices of innovative research communities and their networks.

The authors point out that the scope of doctoral education is significantly broadened when students' work on their doctoral theses is supported by the collective practices of research teams and by coauthoring refereed journal articles. Collective creativity is at play when novices and experienced researchers share the scientific practices and knowledge accumulated over time by the research community to which they belong. Collective creativity understood in these terms is

referred to as the foundation of practices of scientific excellence. Immediate immersion of doctoral students in these advanced research practices is possible and allows these students to avoid painful trial-and-error actions typical to those who are pursuing doctoral studies without the support of a research community.

Part 2: Creative production and innovation, commonly reduced to individual skills and expertise or individual genius, also materialize as collective activities that cross epistemic boundaries and work through their contradictions and historical transformations.

Anne Edwards and *Marc Thompson* focus on the learning and collective creativity involved in the formation of leaders' organizational narratives and reconfiguring of organizational practices. Their analysis highlights how leaders mobilize available human capital and emotional resources when taking forward changes in new multiprofessional configurations of services to support the well-being of vulnerable children and young people. The analysis shows how collective and creative envisioning of future practices takes shape among the leaders, creating a shared and contestable narrative that represents priorities of the multiple professionals involved.

The study is situated in the context of recent policy changes in the UK that have led to dramatic cuts of funding for welfare services and increasing loss of professional identity for the involved practitioners. In this context, leaders are faced with the challenge of realigning disrupted practices and working resourcefully with limited and damaged human capital. The study shows how the leaders developed future-oriented organizational narratives built on "what matters" to the parties involved, which reflected and sustained the practitioners' identities and supported their collective work. These narratives enabled the participants to agentively act

together on demanding work problems and to shape future directions for the development of the practitioners and the practices.

Sten Ludvigsen and *Monika Nerland* focus on the development and use of standardized knowledge in the three professional and organizational settings of nursing, software development, and accountancy. Because of the introduction of new tools or requirements and increasingly constraining standards, in these three knowledge-intensive contexts, practitioners face the challenge of localizing and sharing scientific or standardized knowledge for achieving creative solutions to novel local tasks.

Learning and collective creativity involved in such contexts in the process of solving novel problems requires recontextualization, transformation, and expansion of universal knowledge, standards and procedures to local meaningful actions and circumstances. Learning and collective creativity are shown to materialize as processes of knowledge construction and knowledge sharing for the solution of new problems in social practices. Asymmetries of different positions, already established knowledge and institutional histories among the participants in the sharing process, are seen by the authors as factors enhancing learning and creativity.

Harry Daniels and *Peter Johnson* focus on the challenges of end-user services formed by assembling originally separate and independent agencies. The authors examine cases in which it is necessary to mobilize truly collective efforts to provide seamless and fit-for purpose services to users whose needs are increasingly specific and constantly evolving.

With the help of examples of children's services and disaster response emergency services, the authors discuss the learning and collective creativity at play in the sociocultural practices of

such service providers. The examples illustrate situations in which the service agencies are confronted with problems for which there is not an appropriate answer available. The authors advocate the adoption of information-technology tools able to support creative interactions, collective awareness of new complex problems, and distributed attempts to solve them.

Reijo Miettinen focuses on creative encounters between experts representing different activities that lead to processes of important innovative product development. The collaborative agency and the creative interactions at play in such encounters are seen as deriving from the meeting of individuals' needs and a shared object of activity.

Two product development processes are used as examples to illustrate how the complementarity of historically formed knowledge and expert resources can mobilize collective creative endeavors leading to important new innovations and technologies. The study describes the creative encounter of a physicist and research manager of a small manufacturing enterprise of radioactivity measuring devices with a client and user of their products who was a university professor in a department of molecular endocrinology. The encounter led to the development of a new immunodiagnostic method. The second example concerns the creative encounter between the CEO of a biotechnology enterprise and the leader of a research group on hot-spring bacteria, which led to the study of thermo-stable enzymes. The chapter points to the crucial importance for collaborative learning and creativity of developing spaces that allow encounters across epistemic boundaries similar to those discussed in the examples.

Part 3: The study of collective creativity and learning will benefit from interventions aimed at mobilizing creative efforts of practitioners and communities in problem solving and development of activities.

Klaus-Peter Schulz and *Silke Geithner* address the challenge of fostering collective creativity and learning in organizational development. The authors discuss the use of play in corporate environments to support collective interactions to resolve emerging contradictions in the organization and to build new perspectives for the future.

An application of the "serious play" method using LEGO bricks is discussed to illustrate how such means allow practitioners to bridge their different perspectives to develop solutions based on an understanding of the contradictory forces at play in the organization. The authors reflect on the use of this method in a product development and design research institute that needed to develop a new vision for its future. The use of this method allowed the participants to adopt a systemic point of view on the research institute beyond the traditional disciplinary and intraorganizational boundaries.

Gerhard Fischer discusses learning and collective creativity as a necessity for addressing fundamental problems of today's world, problems that are increasingly systemic, ill-defined, and unique. The study brings attention to the shift from consumer cultures, based on production and passive consumption of finished goods, to cultures of participation, which allow people to actively contribute to creation processes and to the solution of personally meaningful problems. Cultures of participation are seen by the author as key new opportunities and challenges to foster learning and collective creativity.

The chapter presents four examples of sociotechnical environments that serve as effective support tools for cultures of participation, collective creativity, and learning. The examples show how these environments give space to diverse voices and perspectives, allow accessibility to the work and ideas of all users, and contribute to community development.

With a particular emphasis on the context of educational reforms in the UK, *Viv Ellis* discusses the current vulnerability of the teaching profession due to neoliberal pressures toward marketization of public services that often produces isolation among teachers within their schools and among schools themselves. Against this background, learning and collective creativity are conceptualized as essential, defining features of the professional cultures of teaching through which the actions of individual practitioners can gain meaning and societal significance.

The study brings attention to the need of community-based professional creativity developed through future-oriented intellectual interdependence where teaching practitioners jointly nourish the object of their activity. A way to foster professional creativity is presented with the help of the example of a three-year intervention effort involving English language and literature teachers in several schools, aimed at stimulating the relational development of collaborative and creative ties among them.

Yrjö Engeström examines learning and collective creativity as processes of formation of new concepts that guide and organize future work. An emergent concept is described as taking shape through multiple attempts at representing and stabilizing which, although never fully controllable or complete, crystallize collective learning potentials and creative novelty for transforming work.

The author offers as examples two interventionist projects that led to the formation of such concepts, one in a university library and another one in a home care service for the elderly. Concept formation transpires from these cases as a creative and collective process embedded in the space of the local material and social circumstances in which the practitioners examine, debate, and work out the contradictions in their work activities.

CONCLUDING REMARKS

Learning and collective creativity are reflected upon in these chapters with a particular emphasis on endeavors attempting to meet contemporary societal challenges. Such endeavors include various projects of design, innovation, and the arts and have indisputable learning and creative potentials. The analysis of such endeavors can significantly enrich our understanding of learning and collective creativity.

Art and innovation in these cases are hybridized with various kinds of practical activities, usually not conceived as settings of artistic or aesthetic production or innovation. In this volume, creativity is seen as permeating our daily activities. Whereas studies of situated learning in everyday contexts have mainly dealt with the acquisition of already existing expertise, in this book, the focus is on creation of new practices and new knowledge in contexts of everyday activity. Learning emerges as movement through historical transformations.

Collective creativity and learning are seen here as indispensable for facing the societal challenges of our time. The book as a whole is an argument for collective involvement in searches for creative solutions to the pressing societal problems of today's world. The case studies of interventionist attempts included in the book are examples of ways to mobilize

collective efforts of professional practitioners and communities in creative societal problem solving and learning.

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