

Not from the Inside Alone but by Hybrid Forms of Activity: Toward an Expansion of School Learning

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Abstract. *This article illuminates and analyzes a hybrid educational project as intervention research in Osaka. The intervention research aims to develop a hybrid activity system in schools, based on a partnership between a university and local elementary schools but also involving other social actors and institutions. These parties are involved in designing and implementing such forms of activity as children's project-based learning and networks of learning to bridge the gap between school activities and the productive practices of everyday life outside the school. Based on the framework of activity theory and the expansive learning approach to school innovation, the idea of this intervention is that expanding school activity is carried out not from the inside alone but by creating hybrid and symbiotic activities in which various involved partners inside and outside the school collaborate and reciprocate with one another; participating organizations and actors potentially share expanded new objects of educational work. In these symbiotic forms of activity, various providers of learning outside schools offer different learning trajectories to teachers and children, and the rules and patterns of instruction/learning are different from those in classroom-based teaching. The notion of 'negotiated knotworking' is useful in analyzing this emergence of joint engagement. Knotworking refers to a way of organizing and conducting productive activities in hybrid and distributed fields where different partners operate. The involved partners should be seen as a collective of expansive learners who are willingly generating expansive and powerful learning trajectories that are potentially changing the school.*

Keywords: *Hybrid educational project, school-university partnership, networks of learning, school as societal change agent, project-based learning, school innovation, activity theory, expansive learning*

Introduction

‘Cultural-historical activity theory’ offers a conceptual framework to analyze and redesign human collaborative activity from the viewpoint of the model of a collective activity system as an entire unit of analysis of human practice and development, and as a rich source of ideas and tools for modeling future innovative practices (Cole, 1996; Daniels, 2001; Engeström, 1987, 2005a; Engeström et al., 2005). The tradition of activity theory shows us that it is an endeavor to overcome the dichotomous theory-practice gap strongly premised in standard sciences. As Yrjö Engeström points out, activity theory seeks to construct and implement not only observational and analytical but also, more importantly, developmental and interventionist methodologies. “Activity theory has the conceptual and methodological potential to be a path breaker in studies that help humans gain control over their own artifacts and thus over their future” (Engeström, 1991a, p. 12).

The distinguishing feature of activity theory is a developmental theory concerned with qualitative transformations over time in human practice. Its central tenet is how human beings can become agents who can change themselves as they change their own institutions and practices in a way that mobilizes their collaborative agency (intellects and energies to act). Making changes in our own real life-worlds is at the heart of activity theory.

That is why a new theory of ‘expansive learning’ (Engeström, 1987, 2005a) is earnestly needed in developmental research in human practice. “The object of expansive learning activity is the entire activity system in which the learners are engaged. Expansive learning activity produces culturally new patterns of activity. Expansive learning at work produces new forms of work activity” (Engeström, 2001a, p. 139). This new learning theory denotes a powerful modeling of learning in and for the collaborative production of new object-oriented collective activity systems.

Expansive learning, which occurs during the externalized creation of new tools and forms of activity, can mutually transform object and subject in the process of activity, as well as agents and the institutional contexts of practical activities culturally and historically mediated within a society.

In important transformations of our personal lives and organizational practices, we must learn new forms of activity which are not yet there. They are literally learned as they are being created. There is no competent teacher. Standard learning theories have little to offer if one wants to understand these processes. (Engeström, 2001a, p. 138)

Thus expansive learning can evoke and generate critical and creative agency for learners to master their own lives and futures (Yamazumi, in press). Researchers as active interventionists in activity-theoretical studies attempt to facilitate, support, and follow cycles of expansive learning by all practitioners

engaged in their own practical activities.

In traditional school activity, the object of educational work is classroom-based teaching that transfers the given contents of textbooks to individual students. Educational institutions are tightly closed activity systems that have little impact on societal activities outside the real life-world. To go beyond this closed idea of school and demand serious expansion of school activity, this article focuses on the emerging hybrid and symbiotic forms of school activity in which various involved parties and partners inside and outside the school collaborate and reciprocate with one another; participating organizations and actors potentially share expanded new objects of educational work.

In the following section, I begin by discussing an expansive learning approach to school innovation as a promising new scenario for sustainable school change. Second, by depicting the two dimensions of expansive development of the school, I will illustrate that expanding school activity involves the idea of changing the school by expanding various networks of learning and creating hybrid forms of activities. Third, I will analyze some data and findings from the implementation process of a hybrid educational project as intervention research in Osaka. This intervention research aims to develop a hybrid activity system in schools, based on a partnership between a university and schools but also involving other social actors and institutions. Finally, an expansive development of the school in this hybrid activity will be discussed, looking at emerging forms of school learning by creating collaboration between learners, schools, and other producers of learning outside schools.

Expansive Learning Approach to School Change

Expansive Learning to Create Networks of Learning

School changes are more complex and inherently contradictory than educational literature has recognized. A number of factors, which cannot be reduced to technical aspects, need to be considered in school changes. They should be seen as collaborative, self-organizing processes, but they are often misleadingly seen as monolithic or uniform. Therefore, we must move studies about school change beyond normative managerial views to finding strong motivation for teachers, children, and people living in the school community in the object of their educational work.

It is necessary to develop and share a new model of the school and the educational system. This model must expand beyond the factory-like, machine model of mass production and the industrial age system of schools, the ‘one size fits all’ imperative, characterized by strong classification, control, and images of machines that imply the static and linear ways of human learning. In contrast to the machine model, we must reinforce a broader and more complex image of a collaborative self-organization, a living activity system in which the school continues to offer growth, self-evaluation, development, and creativity for all concerned participants.

Engeström's theory of expansive learning, which has been increasingly referred to and used by researchers who explore learning to change in various fields of work and organizations, holds promise for changes in current educational practices and institutions. Expansive learning in schools (Engeström, 1991b, p. 255) would construct a new, expanded object of learning by connecting the following different contexts of learning with each other: the context of criticism (the powers of resisting, questioning, contradicting, and debating), the context of discovery (the powers of experimenting, modeling, symbolizing, and generalizing), and the context of practical social application (the powers of social relevance and embeddedness of knowledge, community involvement, and guided practice). This kind of an expansion in the object proceeds to break the "encapsulation of school learning" within the confines of the school texts and thus implies a qualitative transformation in the entire activity system of school learning.

...[E]xpansive learning proposes to break the encapsulation of school learning by expanding the object of learning to include the relationships between traditional school text, the context of discovery and the context of practical application, thus *transforming the activity of school learning itself from within*. This transformation is carried out through particular curriculum contents. It is a long, distributed process, not a once and for all transformation dictated from above. (Engeström, 1991b, p. 256)

This expansive transition toward a new activity system of school learning, which Engeström describes here, is itself a process of learning through collective and reflective self-organization from below. It is of crucial importance that the collaborative self-organization manifests itself in the "creation of networks of learning that transcend the institutional boundaries of the school," turning the school into a "collective instrument" (Engeström, 1991b, p. 257). In other words, expansive learning for school innovation offers teachers', children's, and participants' learning as collaborative, self-organizing processes for transforming the activity of school learning itself from within.

This kind of learning to transform the school activity system motivates the school community to engage in the following expansive development of school learning: the expansion of the object of school learning to creating multiple contexts of learning, breaking the encapsulation of school learning and thus the expansion of the entire activity system of school learning, and the formation and creation of collaborative self-organization and advanced networks of learning transcending the institutional boundaries of the school.

In this way, teachers, children, and people living in the school community should be seen as a collective of expansive learners who are willing to make school innovations together and become collaborative change agents by turning their school institution into a collective instrument for them. The expansive learning approach opens up qualitatively new possibilities for a new form

of school innovation called school as change agent. It involves collaborative self-organization and networks of learning for transforming traditional school learning and pedagogical practices.

School Reform as Expansive Learning

On the other hand, according to Engeström's and his colleagues' analysis (2002), there are deep constraints and built-in obstacles to collaborative self-organizing and expansive learning on the three dimensions of activity systems in schools: the "socio-spatial structure of encapsulation," the "temporal structure of punctuation," and the "ethical structure of success-as-grades." Such constraints are embedded in traditional school learning focusing on texts, exams, and grading and make school innovation very difficult. In a similar manner, the teachers' work and the division of labor in schools is largely compartmentalized, segregated, and individualized. "One of the effects of these constraints is to make it very difficult for school communities to collectively analyse and redesign their practice" (Engeström et al., 2002, p. 211).

This is why the expansive learning approach as a useful intervention in changes is much needed for participants to be facilitated, supported, and followed in collectively reflecting on their practices and engaging in exploring possibilities of transformation. In this intervention, teachers' expansive learning by means of questioning, modeling, and experimentation for the new generation of the entire activity system in schools (new artifacts, rules, and patterns of pedagogical practice) is facilitated, supported, and followed through their dialogue and debate.

Ann Lieberman and Lynne Miller (2004, pp. 10-11) clarify in their work on the professional development of teachers that "as a profession, we must refashion the old realities of teaching into new ones if we are to meet demands of the new century." They formulate the following three transformative shifts: "*from individualism to professional community*," "*from teaching at the center to learning at the center*," and "*from technical and managed work to inquiry and leadership*." They explain the second transformation as follows:

When teachers shift their attention from the act of teaching to the process of learning, they corroborate for each other that "one size fits few" (Ohanian, 1999). By looking collaboratively at student work and designing curriculum, assessments, and instructional strategies together, they gain the collective knowledge, confidence, and power to co-construct alternatives to standardized approaches and measures. (Lieberman & Miller, 2004, p. 11)

This shift from teaching at the center to learning at the center implies that school reform is itself a process of learning through collective and reflective self-organization in the school community. As mentioned above, the expansive learning approach proposes this type of shift that encourages people living in the school community to enjoy learning at the center of school reform as col-

laborative, self-organizing processes from below, rejecting and deviating from standardized approaches and measures.

The essential concern with expansive learning in and for the creation of new forms of pedagogical practices in schools is that people involved in schooling can “design and implement their own futures as their prevalent practices show symptoms of crisis” (Engeström, 1991b, p. 256).

The expansive learning approach exploits the actually existing conflicts and dissatisfactions among teachers, students, parents and others involved in or affected by schooling, inviting them to join in a concrete transformation of the current practice. In other words, this approach is not built on benevolent reform from above. It is built on facing the current contradictions and draws strength from their joint analysis. (Engeström, 1991b, pp. 256-257)

As Michael Young (1998, p. 155) points out, an expansive learning approach is not another top-down strategy for educational reform in a learning society. If such reform as improving all students’ achievement with good intentions is dictated from above, it is still an open question whether schools could be motivated to engage in such reform. Instead, the expansive learning approach can only start with actually existing conflicts and dissatisfactions among participants involved in schooling. Such rejection and deviation from standardized procedures and scripted norms in schooling are indications that the involved participants’ agency is at work there. The strength of this model is the extent to which it is built on facing current contradictions rather than “some utopian ideal; its weakness is that it still remains abstract in conception, despite its claim to be located in real contradictions” (Young, 1998, p. 155).

An expansive learning approach in schools is a promising scenario that would evoke and generate the involved participants’ critical and creative agency for school reform as collaborative self-organization from below, creating networks of learning transcending the institutional boundaries of the school (Yamazumi, 2001, 2005, 2006a). This approach is based on bottom-up, reflective communication initiated among teachers, students, parents, and people involved in schooling.

School as Societal Change Agent: An Expansion of School Activity

Teaching and learning in schools are usually divided into two segregated structures. In activity-theoretical terms, one can depict these structures as two discrete and compartmentalized activity systems. On one hand, there is the teachers’ activity of step-by-step transmission-centered teaching of predefined, fixed knowledge and skills. On the other hand, there is the students’ activity of enduring “a series of more or less disconnected though systematically repeated learning actions” (Engeström, 1987, p. 104) such as daily assignments. To

break through such segregated activities, teachers and students must collaboratively construct an expanded, shared object of a joint learning activity. In this way, students may become the subjects of a whole system of learning rather than the mere subjects of separate learning actions.

In Figure 1, adapted and modified from Jaakko Virkkunen (2007) for my argument here, the ongoing school changes related to different forms of learning and organization are depicted by crossing two dimensions of expansive development in schools.

One is the vertical dimension, which depicts the types of problems students are working on and identifies the developmental trend from learning by acquisition of correct answers as responses to given tasks in school texts and the classroom to learning by questioning and creating the problem itself in relation to real life and society. The other, along the horizontal dimension, describes the types of school organizations and their relation to the outside communities and organizations and goes from isolated school to networked and hybridized school.

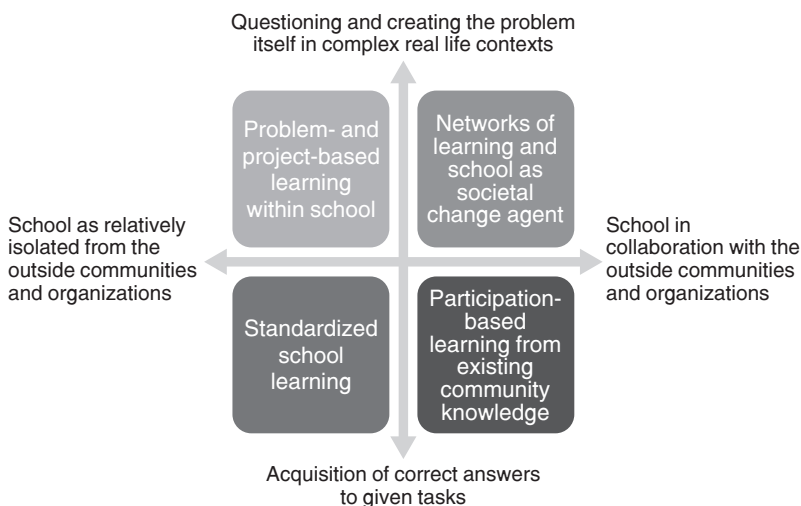


FIGURE 1 Two dimensions of expansive development in schools

These two crossing dimensions are distinguishing features in which the expansion of school activity can be identified as transcending both the encapsulation of school learning and the institutional boundaries of school organizations. The lower left field represents school changes based on technical rationality called ‘standardized educational reform,’ which is one of the most influential, dominant tendencies in educational changes today. This current field focuses on the encapsulated school activity, in which teachers’ work has been defined by subject-by-subject curriculum packages and guidelines, stage-by-stage teaching models, and such technical controls of learning outcomes as

standardized tests. The object and motive of school activities has been reduced and reverted to traditional teaching and learning methods.

As Andy Hargreaves (1994, p. 26) warned about such increasingly technical controls imposed from above in “reform,” teachers have been subjected to and subjugated by the “deskilled labor process,” and current school reform policies threaten the very desire to teach that has defined teachers’ work and delimited their powers of discretion. This type of change based on standardization obviously opposes such ways of schooling as collaborative self-organization. Ralph Tyler (1950) is an influential representative of this view of the school with his model of curriculum planning as a linear process of writing objectives, selecting and organizing materials, and evaluating outcomes and preparing “teacher-proof materials.” As Michael Connery and Jean Clandinin (1988, p. 179) criticize, “there is little room for a teacher’s personal knowledge and a narrative understanding of curriculum” in such processes as Tyler’s model and those developers of “teacher-proof materials” also want to “have little place for teachers to adapt or change what they saw as well-developed materials that taught specific things in specific ways.”

In Figure 1, the upper left field is the extent to which the school transcends the encapsulation of learning, and progressive pedagogical approaches such as problem- and project-based learning are applied in schools though their application is defined within the school. In the lower right field, school activities and pedagogical approaches move beyond the institutional boundaries, building partnerships with communities and organizations outside the school. In this field, it is possible to attain participation-based learning in collaboration with the outside communities and organizations but the scope and contents of learning are confined within existing community knowledge.

The working hypothesis of this article is that the two dimensions of expansion can be combined in a new pedagogical approach and school organization represented in the upper right field. In such a pedagogical transformation, learning is to a great extent carried out in various networks of learning and hybrid forms of activities in which representatives of local productive work are also involved, and the rules are different from those in the classroom. This new type of school can be called ‘school as societal change agent’ based on the notion of expansive learning as a new form of pedagogy mentioned in the previous section, in which the active change agent role of the school has been illuminated.

The expansion of the school as societal change agent is investigated in new creative collaboration practices between schools, communities, and various organizations outside schools. In this expansion, innovative schools can act as agents of societal change by undertaking collaborative efforts such as community revitalization, cultural production, economic innovation, and citizenship activation, which involve hybridizing with other actors through networking, interaction, dialogue, and boundary crossing.

Creating a Hybrid Activity as an Intervention: In Search of a Productive Collaboration between School and Other Actors

Hybrid Activity as Intervention Research

Here I will illustrate and analyze the emerging new forms of school learning in a hybrid activity called 'New School' (NS) in Osaka. It is based on a partnership between a university and local elementary schools that also involves other social actors and institutions. Their collaborative efforts are supported by the Center for Human Activity Theory at Kansai University (Yamazumi, 2006a, b, 2007, 2008, in press).

NS is a children's after-school learning activity project in which the following partners cooperate to create advanced networks of learning: a university, local elementary schools, families, experts, and community organizations outside the school. In the NS project as an intervention, these parties are involved in designing grade-mixed, group- and project-based learning and networks of learning.

As Katsuhiro Yamazumi (2006a, pp. 86-87) demonstrates, project-based learning could be described as a new form of school learning activity where groups take part in long-term in-depth investigation projects on topics that are networked with the creation of the real life-world and community activities.

Elementary school children are engaged in fun, creative, and collaborative learning processes. Inspired by everyday practices, the themes of NS activities include food, eating and cooking, gardening and farming, personal well-being, ecological awareness and thinking, responsibility for the environment, and a sustainable future. NS activities develop agentive, critical, and creative learning abilities in the children involved in the project.

In 2007, local elementary school children and university students who will become elementary school teachers carried out project-based learning titled "Our Dining Table: What Are Local Vegetables?" at the center every Wednesday after school. The children investigated local vegetables with the support of university students (see Figures 2a and c). Outside experts and producers were involved in discussions with the children, the university students, and the researchers and staff. They made miso and pickled vegetables. In addition, they worked on a farm on holidays (see Figures 2b). Finally, they created recipes for Japanese food and cooked in the school's home economics room (see Figures 2d).

By exposing children to community activities and the productive practices of farmers, agricultural experts, senior nutritionists, food-related producers, and social organizations, NS activities develop project-based learning for children where actual real life activities are synergistically networked by creating productive collaboration among multiple parties. A key goal is bridging the gap between the activities of the elementary school and the productive practice of everyday life outside the school.¹

The idea of this intervention is that expanding school activity is carried out not from the inside alone but by creating hybrid and symbiotic activities in the



FIGURE 2 NS activities include: (a) project-based learning with support of university students at the center; (b) rice planting; (c) digital-storytelling presentation at the center; (d) cooking local vegetables with support of university students in the school's home economics room and inviting high school students as an exchange program between the university and local high schools. In such a hybrid activity, networks of learning are created and advanced.

real life-world. In particular, the analysis explores how the multiple partners involved in the intervention can expand and share the object of their hybrid educational activities.

In the framework of activity theory introduced by Aleksei Leont'ev (1981, pp. 399-400), the notion of 'activity' is "psychologically characterised by what the process as a whole is directed to (its object) always coinciding with the objective that stimulates the subject to this activity, i.e. the motive." The NS intervention facilitates and supports the multiple partners who are otherwise loosely connected to partially share the object of their new hybrid activities and coordinate their actions around it.

The analysis of NS intervention leads to the preliminary finding that a joint engagement and contribution was truly needed for the school, the university, and even the children themselves to collectively generate expansive and powerful learning trajectories in developing project-based learning units.

The notion of "negotiated knotworking" from Engeström and his colleagues (1999) is useful in analyzing this emergence of joint engagement. Knotworking refers to a way of organizing and conducting productive activities in a hybrid and distributed field where different partners operate. The notion of "knot" refers to partially improvised forms of intense collaboration between otherwise

loosely connected actors and activity systems but engaging in solving problems and rapidly designing hybrid solutions when required to by their common object; in knotworking, there is no fixed center of authority or control (Engeström, 2005b).

Hybrid Activity as Mediating System

The world of educational and professional activity is nowadays increasingly organized in ways that require ‘horizontal movement’ and ‘boundary crossing’ between educational and various social life activities from work to family, leisure, play, and everyday well-being. A current ‘third-generation activity theory’ (Engeström 1996, pp. 132-133) exceeds the limits of a single activity system and adopts as its unit of analysis multiple different activity systems that mutually interact, promoting empirical intervention research to design and implement networks, dialogues, and collaboration between these systems.

In this way, third-generation activity theory invites us to “focus research efforts on the challenges and possibilities of inter-organizational learning” (Engeström, 2001a, p. 133). By invoking this framework, it is possible to represent NS as a newly emerging hybrid activity system in which the following multiple different activity systems interact and engage each other: a university, schools, families, and workplaces and organizations outside the school as shown in Figure 3.

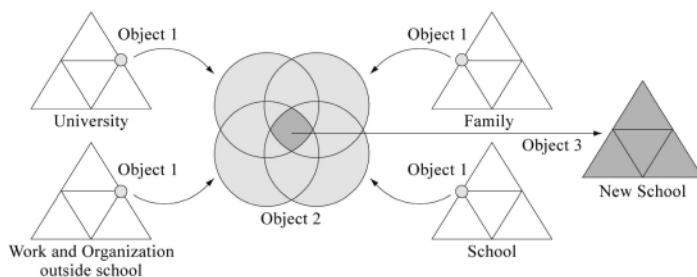


FIGURE 3 New School as a new hybrid activity system

In NS interventions, new mixed activities are created through broad-ranging overlapping and interconnection between the after-school play activities of elementary school children, the learning activities of university students, and the work of practitioners and researchers (Yamazumi, 2006a). Based on the perspective of third-generation activity theory on interacting activity systems with a partially shared object, it is possible to characterize NS as a boundary organization to expand its own objects and partially share a new object.

Hugh Mehan (2007) illuminates and analyzes the inter-organizational collaboration in which his Center for Research on Educational Equity, Assessment, and Teaching Excellence (CREATE) at the University of

California, San Diego (UCSD) makes collective efforts to improve the opportunity for low income students of color to attend colleges and universities by assisting public schools in San Diego in adapting the principles developed at the highly successful Preuss School on the UCSD campus to their local circumstances. He describes how CREATE serves as a mediator between the Preuss School and local schools that have expressed an interest in building a college-going culture of learning in order to improve the education of underrepresented minority students. In this way, CREATE is characterized in terms of an “educational field station,” and it is simultaneously engaged in studying inter-organizational learning by a form of intervention sometimes called “design research” (Brown et al., 1999).

What is interesting for me in my argument here is that Mehan (2007) tries to compare CREATE, positioned as an educational field station, to Engeström’s and his colleagues’ (1996) intervention method Change Laboratory.² There are significant similarities between the two systems to be sure. Both focus on organizational learning and most importantly realize that the process of change is not smooth and seamless. Despite these similarities, as Mehan points out, different features belonging to each can be distinguished.

As I understand it, Change Laboratories are *temporary* activity systems that are set up within existing organizations such as banks, schools, hospitals whereas we conceive of CREATE as an educational field station as a more *permanent* system available for continual consultation. Further, the purpose of “Change Laboratories” is to position the intervention as a tool chosen by the people working within a given organization to help solve some perceived problems in the ongoing course of work (Cole & Engeström, 2007). By contrast, CREATE provides a range of resources such as university students who serve as tutors and teacher professional development programs in science, literacy, and mathematics. (Mehan, 2007, pp. 68-69)

It is possible to equate the work of NS with such a ‘mediating system’ as CREATE. Namely the NS project can serve as a mediating system between local elementary schools and expert groups and community organizations outside schools—community activities and productive practices—offering new forms of school learning activity for children, such as networks of learning and school as societal change agent to schools, and providing a range of resources such as university students and researchers, experts and practitioners outside the school, and physical facilities and equipment for school activities. Figure 4 below is a schematic representation of NS as such a mediating system.

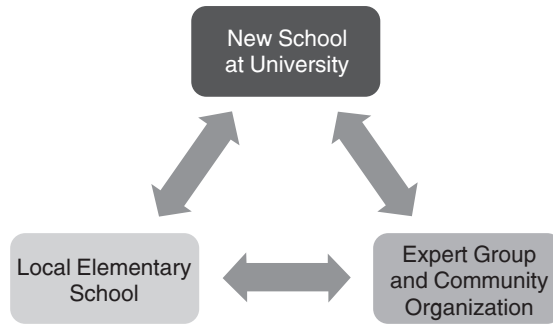


FIGURE 4 New School as a mediating system

Hybrid Activity as Boundary Crossing

Challenged by diversity and dialogue between different traditions or perspectives, the third generation of activity theory has developed conceptual tools to understand dialogues, multiple perspectives, and networks of interacting activity systems. As human activity rapidly changes to partnering and networking among diverse cultural organizations, expansive learning must also be studied and facilitated as movement and collaboration across the dividing, traditional boundaries and gaps between various activity systems. Engeström (2001b) points this out as follows:

The theory of expansive learning has primarily been used to study learning involved in major transformations within a single activity system. The basic model of expansive learning is a cycle or a spiral. The essentially forward-aiming model needs to be complemented with movement along the horizontal dimension—with sideways movement between the various activity systems and actors involved. (Engeström, 2001b)

Such a sideways form of expansive learning for hybrid solutions must be promising, since it can make invention and innovation arise through processes of emergence by “putting disparate ideas together or by connecting different and diverse minds, or both” (Hargreaves & Fink, 2006, p. 163).

With the development of NS, it increasingly mediates in the emergence of networked hybridity. As Kris Gutiérrez and her colleagues (1999) argue, hybridity and diversity should be understood to include not only racial, ethnic, socioeconomic, and linguistic hybridity and diversity but also hybridity and diversity in the mediating artifacts (tools and signs), roles, and activity systems themselves. “Hybridity and diversity, then, are not problematic but rather are viewed as important cultural resources in children’s development” (Gutiérrez et al., 1999, p. 287). In addition, Luis Moll and James Greenberg (1990) present a “funds of knowledge” strategy in which schools draw on the social and

cognitive contributions of parents and other community members to children's development.

While this hybridity is clearly an important resource for developing new activities, it is also full of tensions and contradictions because it takes shape without standardized procedures and scripted norms with which standardization-like reform takes shape (Yamazumi, in press). It is insufficient to merely set hybrid forms of activity. Practitioners themselves should learn new rules and patterns in hybrid activity systems by implementing and expanding them. In the following, I turn to analyze some data and findings from the implementation process of NS activities that have crossed the boundaries between multiple activity systems and intervene in schools as a member of a network of learning.

Expanding Learning Trajectory in Hybrid School Activity

The NS as a hybrid educational project has intervened in schools as a member of a network of learning that is trying something new with children as learners. In particular, this attempt at building partnerships offers NS hybrid forms of learning activity for children, such as project-based learning and networks of learning, to bridge the gap between elementary school activities and the productive practices of everyday life outside the school.

On June 28, 2007, the NS research coordinator and a researcher met with four local elementary school teachers who are in charge of the third to sixth grades and are also members of the school curriculum committee. They discussed the integration of NS activities with school activities. The teachers came up with the following three sets of problems regarding the design and implementation of project-based learning in the school (Yamazumi, 2008):

- 1 Students' lack of basic skills in school subjects to implement project-based learning activities;
- 2 Motivational problems among students in long-term in-depth investigation-like learning;
- 3 Teachers' difficulty realizing new patterns of learning about relatively unfamiliar cross-curricular themes because they cross the boundaries of currently separate school subjects.

In Japan, the Ministry of Education is presently planning to change its educational reform policy to emphasize basic knowledge and skills and student achievement. Standardization-like reform is taking shape. The problems faced by teachers about students' lack of basic skills in school subjects are certainly derived from the local contexts of their own everyday practices, but also from the global history of educational reform at the national level.

In Japanese schools, although progressive pedagogical approaches such as problem- and project-based learning have a long history of being applied in schools, their application is often defined within the school-tasks in textbooks

and classroom-based teaching. Schools are still relatively isolated from outside communities and organizations. Creating networks of learning is a non-dominant activity that breaks the encapsulation of learning and moves beyond the institutional boundaries of schools.

In the meeting between the teachers, the NS research coordinator, and the researcher, one promising idea emerged about the expansive development of multiple and project-based learning activities.

EXCERPT 1

Researcher: From today's discussion, it seems that a common issue for all four teachers here is having the children undertake learning that involves investigations, finding out what they want to know. Here, I think the research center can work with the teachers and create new forms of learning...

Teacher 1: Collaboration and cooperation? Let's start with the third graders!

Everyone: (Laughter).

Here an initial 'knot' as emerging forms of collaborative work was generated between the school and NS to be able to cross their different logics and institutional boundaries. This joint engagement was designed to implement the third graders' and their teachers' project-based learning unit titled "A Kansai University Exploration: What Place?" in the 2007 fall semester. In this planned project-based learning unit, NS invited the third graders to the university and facilitated their group- and project-based learning to investigate such themes as the facilities, equipment, and people's activities in the university that might interest the children.

According to the national curriculum standards in Japan, the individual elementary school curriculum includes a 'Period for Integrated Study' dealing with interdisciplinary and cross-curricular themes for third graders and older in addition to school subjects. Its content is not prescribed in the national curriculum standards. Individual schools are expected to make efforts to develop and conduct distinctive project-based learning activities for it. The curriculum unit "A Kansai University Exploration: What Place?" for approximately 31 school hours was planned and carried out collaboratively by the teachers, the NS research coordinator, and the researcher for 'Period for Integrated Study' at the school.

In the unit, the teachers and children got involved with interesting themes and problems in their investigations at the university. After their first visit to the university, the children discussed and proposed their own interesting themes and problems in their classroom lessons, which they wanted to investigate in their second visit. The teachers faxed the NS research coordinator a list of themes and problems that the children were interested in. According to this list, the NS research coordinator discussed and planned the children's second visit to the university with the involved university students, foreign students,

and staff who work at the following five departments of the university: the museum, library, IT center, student hall, and the Center for Human Activity Theory.

This way, in October and November 2007, the children and their teacher discovered interesting problems and tasks by themselves, and organized small groups to follow up their interests and implement their project-based learning activities (see Figure 5). Each group carried out its own investigative and exploratory work at one of the five university departments. After the investigating and exploring, each group made a report, figuring out a good way to present the outcome of the learning activity. Lastly, they held a presentation in the classroom.



FIGURE 5 Third graders' project-based learning unit, "A Kansai University Exploration: What Place?": (a) introduction to university by university students at the Center for Human Activity Theory (CHAT); (b) visit to university museum; (c) visit to university's IT center; (d) exchange meeting between children and university foreign students at CHAT; (e) group work in classroom; (f) final presentation by each group in classroom.

On February 12, 2008, the NS research coordinator and a researcher held a sort of reflective case study meeting on the children's learning trajectories with six teachers at the school. In the meeting, after watching video of the children's learning activities, the participants presented their reflections and personal sense-making around concrete cases of the learning trajectories carefully selected from all videotaped practices, children's notebooks and files, and their works and presentations.

The following Excerpts 2 and 3 are narratives told by the two teachers in charge of the third grade:

EXCERPT 2

Teacher 2: As stated earlier, that is not the way it usually is. But after viewing the study digest video, I can see in their earnest faces how you got the kids interested in learning. Normally, whenever the kids hear that a visitor from Kansai University is coming, they get excited. I thought their enthusiasm might wither after awhile, but it never did. Rather, such visits are a source of stimulation.

EXCERPT 3

Teacher 3: In some cases, a kid may know the university superficially because his mother works on campus. But this time, through such an opportunity, the kids could visit the university and experience for themselves how it is different from their elementary school. They could see what a university really is. As the kids grow up this early experience with the university will serve as a special asset. I also think elementary school and university are qualitatively similar. For example, in middle school and high school, kids have to struggle with strict curriculums and examinations. On the other hand, in both elementary school and university, students can select their own study themes, do research, and announce their results. In that sense, elementary school and university encourage learning through collaboration and group activity. So in conclusion, I think that this time the kids have been provided with an excellent learning experience.

In the meeting, the participants discussed the following concrete case of the children's learning trajectories. "Description of Wild Boar," Excerpt 4, was written and presented in the group's 'newspaper.' The four children of the group visited the university museum and made a 'newspaper' that included Excerpt 4. Using it, they reported their museum investigations to the classmates at the final-presentation class.

EXCERPT 4

Description of Wild Boar: In ancient times, people hunted animals and ate them. It took one week to kill one boar and two weeks to catch another one. Ancient people had no refrigerator, so they could only catch wild boar. Ancient people lived by eating wild boar hot pot. It was a very tough lifestyle.

The participants collaboratively discussed how this 'description' emerged:

EXCERPT 5

Researcher: Kids who came to study at the museum were left with the impression that ancient people had a tough life because they were only able to eat wild boar.

Teacher 2: The Museum Director told Teacher 3 that he was happy that this

was the impression kids got from the talk. What the Museum Director actually told the kids was that ancient people could only hunt and kill one — not two — wild boar at a time.

Teacher 3: I see, today it is possible to refrigerate meat, or game like wild boar. But life was different in ancient times as people hunted for one thing and completely consumed it before hunting again. When people were not hunting, what did they do in their spare time? Well, one thing they did was polish stoneware. The sparkle that ancient people polished into their stoneware was a kind of status symbol. The more brilliant the sparkle, the greater the respect a person received. The gist of the talk was that ancient people hunted for three hours and lived off their catch for two weeks. Once the meat had been eaten, people would hunt for another three hours and then live off their catch for the next two weeks. That was their lifestyle cycle.

Teacher 2: I also think it is incredibly interesting how the kids used the word “tough” to describe the lifestyle of ancient people. Now I understand the main impression that the Museum Director wanted the kids to receive from the talk. For ancient people, it was a tough life.

Researcher: I also think that the kids’ perspective is extraordinary. It is a perspective that may be unique to third or fourth grade elementary school children. As Teacher 3 says, it is a perspective based on good reason. One might expect a detached, modern perspective from the kids and a response like “Isn’t it ‘strange’ how ancient people ate wild boar?” But that was not their point of view at all.

The children’s powerful ‘description’ emerged from their knotworking with a university museum curator around exhibition. In this way, multiple learning trajectories were produced in knotworking-type collaboration among teachers, the NS and university people, and children themselves.

Conclusion

It is useful to analyze this emergence of joint engagement between the school and NS with the help of the concept of knotworking as it apply to emergent forms of collaborative work and organizations. By using the knotworking-type formation of collaborative performance, the otherwise loosely connected school and NS can cross boundaries between involved activity systems and expand their willingness to make school innovation together through sharing their common object.

This intervention in the expansive development of the school must consider the complex learning trajectories of an individual, collective, or whole organization as new emerging objects of educational work. Such multiple learning trajectories are produced in collaboration among schools, various providers of learning (e.g., universities, experts, workplaces, community organizations), and the learners themselves.

The analysis of NS intervention concludes that a joint engagement and contribution was truly needed for the school, the university, and even the children themselves to collectively generate expansive and powerful learning trajectories in developing project-based learning units. At the same time, the participants themselves should learn new rules and patterns in hybrid activity systems by implementing and expanding them, since their activities take shape without standardized procedures and scripted norms.

Expanding the object of school activity requires that learners, schools, and various producers of learning engage in knotworking to connect and reciprocate all the potential resources of learning trajectories. In this knotworking, a negotiated learning agreement can be produced between children, teachers, and various providers of learning experiences and educational services outside the school. This educational knotworking can evoke and generate agency willing to changing the school, not from the inside alone but by creating hybrid forms of activity.

Acknowledgements

The joint research project described in this article was developed at the Center for Human Activity Theory, Kansai University and partly funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) as an “Academic Frontier” Project. My special thanks are due to colleagues who worked on the research project and to participants in the project. A previous version of this article was presented at the 4th International Symposium ‘New Learning Challenges’ organized by the Center for Human Activity Theory at Kansai University, Osaka, Japan, on March 6th, 2008. I gratefully acknowledge valuable constructive discussions with Dorothy Holland, Jean Lave, and Yrjö Engeström on several points in the manuscript of this article.

Notes

1. This kind of educational idea should evoke a central theme of John Dewey’s Laboratory School at the University of Chicago. In his book *The School and Society* published in 1900, Dewey (1990, p. 79) asks “what the school must become to get out of its isolation and secure the organic connection with social life.”
2. Change Laboratory (Engeström, 2007; Engeström et al., 1996; Engeström et al., 2005) is an already well-defined intervention method in a broader interventionist methodology called Developmental Work Research (DWR; Engeström, 1993, 2005a), developed at the Center for Activity Theory and Developmental Work Research, University of Helsinki. The method develops “work practice by the participants in dialogue and debate among themselves, with their management, with their clients, and—not the least—with the interventionist researchers” (Engeström, 2007, p. 370). Its intervention is implemented as a rich set of tools available for facilitating, supporting, and following cycles of expansive learning by participants: analyzing, reflecting, criticizing, and discussing perceived disturbances and contradictions in their existing work and organizations; modeling and implementing a problem solution for the new practice;

and thus moving into mastering their own models and visions for the community's and organization's future.

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