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# Cultural historical activity theory and Dewey's idea-based social constructivism: Consequences for Educational Research

## Summary

**Background:** Our theoretical perspectives direct our research processes. The article contributes to the debate on Cultural Historical Activity Theory (CHAT) and Dewey's idea-based social constructivism, and to the debate on methodology and how the researcher's theoretical stance guides the researcher in his or her work.

**Purpose:** The article presents fundamental ideas within CHAT and Dewey's idea-based social constructivism. The purpose of the text is to discuss and examine how ideas in these two theories guide educational research conducted within the framework of these two approaches. Furthermore, the article aims to contribute to the discussion on CHAT and Dewey's theory.

**Sources of evidence:** Ideas based on Vygotsky's theories, represented mainly by James Wertsch, Michael Cole, Barbara Rogoff and Yrjö Engeström, and Dewey's ideas, are examined and discussed in relation to educational research. Furthermore, statements made by Mietinnen, Garrison and Rorty are taken into account in the discussion on the two outlined theories.

**Main argument:** When CHAT and Dewey's theory guide researchers in their work, they have to take the context or situation into consideration. Artefacts are treated as part of this context, and therefore have to be a focal point of the research. In educational research the classroom and the teacher are also central parts of the learning environment or context. The teacher is the one to form the learning environment in which the pupils think and act, and therefore, the teacher's role in the classroom is important. If researchers are to manage to focus on pupils' learning, they must direct their research focus both on the teacher as an organizer of the activities and on the collaborating and supporting processes

between the teacher and the pupils, and between the pupils. This means that the research focus has to include both activity and dialogue, which includes processes in all their complexity.

**Conclusions:** Mediating artefacts play a central role both in CHAT and Dewey's theory. If the researcher is to ascertain what the pupils learn when using specific artefacts, he or she will have to study the activities or processes within which these learning aids are used. This indicates that the researcher has to study learning processes in progress. Garrison states that Dewey's approach is a philosophy of cultural development. Mietinen finds that Dewey's theory does not serve as the foundation for both historical and cultural analyses of action. I disagree with Rorty and Mietinnen, and rather follow Garrison's lead. In both theories, social, cultural and historical factors are, in my opinion, viewed as decisive factors intertwined in what happens here and now. Therefore the setting that frames the activity with its social, cultural and historical aspects also has to be brought into focus in one's research activity.

Cultural Historical Activity Theory (CHAT)<sup>1</sup> and Dewey's idea-based social constructivism share the epistemological approach, stating

<sup>1</sup> Cultural Historical Activity Theory was developed by Leontëv on the basis of Vygotsky's theories and ideas (Wertsch 1981). In Europe and the U.S. "socio-cultural theory" would appear to be the most common label for the theory that is founded on Vygotsky's ideas (Wertsch 1991, Wertsch, Rio & Alvarez 1995). In

that active individuals construct knowledge in social interaction using mediational means (Prawat 1996). This breaks down the Cartesian wall and lays the foundation for an interaction between us and the environment we live in. We are affected by the environment or the “world” and vice versa. Even though these two theories were developed in each their part of the world, the ideas they are based on were not new to either Dewey or the early Russian cultural-historical psychologists. In America, CHAT is in fact regarded as a development of Dewey's ideas (Valsiner & van der Veer 2000).

This article will present fundamental ideas within these two theories and also discuss similarities and differences between them. Guba (1990) states that a basic set of beliefs guides action. It is therefore important that researchers are aware of the connection between theoretical traditions and research practices so that a link can be created between their theoretical stance, the question asked, the method chosen and the way the data material is collected, analyzed and interpreted. I will also relate my statements and conclusions to earlier discussions on the topic. Moreover, I introduce the

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Stalinist Russia, putting too much emphasis on mentalistic constructs, such as meaning, was politically risky, and thus this tendency in Vygotsky's work was regarded as dangerous. Vygotsky's follower, Leontëv, therefore distanced himself from his teacher. Instead of emphasizing meaning and further downplaying the role of such psychological tools as mediators, which was Vygotsky's focus, Leontëv preferred to highlight the importance of the child's actual relations with reality (Kozulin 1990). In the 1960s Ilyenkov was able to move somewhat away from the focus on practical activity. His version of Activity Theory allowed for nonmaterial phenomena like meaning and value (Bakhurst 1995). Thus, the political atmosphere forced Leontëv to downplay the role of psychological artefacts. Nevertheless, a careful reading of Leontëv's work reveals that both mediation by signs and subject-subject relations play an important role in his theory (Engeström 1999). According to Engeström & Miettinen (1999), the integration of discourse into the Cultural Historical Activity Theory has only just begun. When it comes to CHAT, I treat language as a mediating artefact equal to technical tools.

concepts of “dialogue” and “activity” as units of analyses for educational studies conducted in the framework of the two outlined theories. I conclude the article by discussing what consequences the presented theories and their related concepts have for educational research.

## Fundamental Ideas in Cultural Historical Activity Theory and Dewey's Idea-Based Social Constructivism – Similarities and Differences

Both Cultural Historical Activity Theory (CHAT) and Dewey's idea-based social constructivism bridge the gap between the dualism of mind and world. In CHAT, “psychological” and “technical” tools are the mediating artefacts between the individual and the world around him/her. In Dewey's idea-based social constructivism, the idea functions as a corresponding bridge between these two entities. In CHAT it is said that the artefacts human beings use influence their activity, while at the same time they develop or create new artefacts that again affect their actions in new ways (Leontëv 1981, Miettinen 2006). In much the same way, Dewey (1916) stated that people's ideas or thoughts affect the physical environment, and the affected environment in turn influences their thoughts. In both theories the person is looked upon as a conscious and active participant in the reciprocal activities that take place. This reciprocal connection means that the environment for actions has a prominent place in both theories.

In CHAT, all higher mental functions are looked upon as having a social or cultural origin, as stated in the general genetic law of cultural development (Vygotsky 1978). Dewey (1938) was also interested in how the environment could become a social source for people's experiences. He claimed: “It ought to be necessary to say that experience does not

occur in a vacuum. There are sources outside an individual which give rise to experience” (p. 39). Dewey (1900) said that the mind cannot be regarded as an individual, monopolistic possession. The mind, he said, is developed in an environment which is social as well as physical, and social aims and needs have been most potent in shaping it. Social aims, in my opinion, will be shaped in the culture in which people live and act, and thus culture will affect mind and vice versa. Opinions differ, however, on the extent to which Dewey’s theory takes culture into account. According to Rorty (1982, 1998), due to Dewey’s belief in naturalism, he was constrained by the idea of continuation from lower to higher organisms, and furthermore, specifically did not appreciate human experience based on the use of language. On the other hand, Garrison (1995, 2001) finds that Dewey’s approach is a philosophy of cultural development. Miettinen (2006) contends that Dewey’s theory is not the foundation for both historical and cultural analyses of action. As you will see, I disagree with Rorty and Miettinen, and rather follow Garrison’s lead.

Even though Dewey saw the importance of the social environment as a medium for growth and development, the notion of tools never had the same prominent place in his philosophy of education as in CHAT. The early Russian cultural-historical psychologists knew about Dewey and where he placed tools in his theory (Cole 1996). Thus the idea of tool mediation was not new to them. But in CHAT, tools or artefacts are more prominent, as they are looked upon as extensions of the individual (Prawat 1996). In socio-cultural theory and later in CHAT, language is looked upon as the “tool of tools” (Luria 1928, Vygotsky 1986/2000). Dewey (1916) said that the ear is as much an organ of experience as the eye or hand. He furthermore claimed that social knowledge is learnt in social intercourse and that one also learns a great deal from others as part of

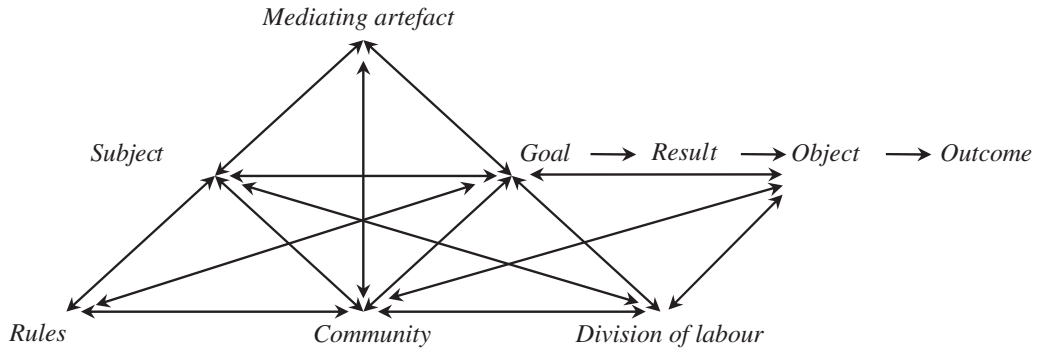
this intercommunication. Dewey (1925) also looked upon language as the “tool of tools”. He claimed that language has a major role to play compared with other tools because it can represent conditions that have lost their original quality in becoming social tools (Dewey 1916). This reveals that language as a tool also has a conspicuous place in Dewey’s theory. This means using both these theories as the theoretical framework, i.e. that talk and dialogue can show and thus reveal how pupils and teachers and pupils together interact and support learning, and therefore have to be studied by educational researchers.

CHAT connects the two concepts of internalization and externalization to learning. Learning is about how people use tools that exist in a given culture or society for thinking and acting (Wertsch 1991, Säljö 1999). Internalization is related to the reproduction of the culture, whereas externalization means processes that create new artefacts or new ways of using them (Engeström 1999). These thoughts are also present in Dewey’s theory. He maintained that learning takes place when young people and adults discover something new to them, even though everybody else in the world knows it. As he put it, these people experience the joy of intellectual constructivity and creativity. Dewey claimed that experiences are the foundation for learning and that learning experiences can modify activities both in people’s minds and in the environment (Dewey 1916).

The Activity System, developed by Engeström (1999) on the basis of CHAT, reveals the close connection between the acting subject and its context. This is shown in Figure 1 below which is also a modification of Engeström’s original system.

The minimum elements of the original activity system include, “subject”, “mediating artefacts” (signs and tools), “object”, “rules”, “community” and “division of labour” (Engeström 1987, Cole & Engeström 1993).

Figure 1. The modified activity system



In the modified system the concept “goal” is placed where “object” is placed in the original model. In this way it is possible to visualize goal-directed actions en route to the overall goal or object (Postholm, Pettersson, Flem & Gudmundsdottir, 2004). The concept “result” is defined as the concrete product of the performed actions.

Mediated actions are integrated in the system in the upper triangle. Mediating artefacts function as intermediary aids which the acting subject chooses to use when trying to attain the goals for the actions. In the activity system, context is not reduced to something that just surrounds it, but is interwoven in the actions, becoming a single process. The actions exist only in relation to the context that is visualized by the three triangles at the bottom of the activity system (Cole 1996). The context that comprises the factors “rules”, “community” and “division of labour” sets the premises for and also any restrictions on the subject’s goal-directed actions.

Dewey (1938) proposed a relational theory to describe what happens between the acting subject and its context through his use of the word “situation”. He said: “What is decided by the word situation is not a single object or event or a set of objects and events. For we never experience nor form judgement about objects and events in isolation, but only in connection with a contextual whole. The latter

is what is called “situation” (p. 66). Dewey’s equating of the word situation with a contextual whole is an appropriate description of the word *context* (Cole 1996). This means that the situation as the contextual whole functions as a frame within which understanding can be constructed. Thus the situation and the context have to be studied during educational research to understand the on-going processes.

Cole (1996) finds it appropriate to equate situation with context. Mietinnen (2006), on the other hand, does not agree that these two concepts are similar and argues that the concept situation does not take the history of the actual situation into account. Here I disagree with Mietinnen. As I mentioned above, culture is part of the social environment and therefore culture will be part of the analyses within the framework of Dewey’s theory. Later in the text I argue that the historical dimension is part of Dewey’s theory. In this way my understanding corresponds neither to Mietinnen’s nor Rorty’s opinions on Dewey’s theory.

Dewey (1916) found that goals should be an integral part of actions. He looked upon goals as “ends in view”. They are something that give direction to action. The end in view in a way forms a framework for the actions that take place in its context, it propels these actions. An object is also the overall goal for actions undertaken in an activity system (Engeström & Mietinen 1999). The fac-

tor “goal” in the activity system can thus be looked upon as comprising partial goals (or targets) that have to be reached on the way to the object or, which the acting subject continually will strive to reach. When goals are reached, others will replace them, continuously moving the acting subject towards an unattainable object. Dewey also talked about goals and means in the learning processes, and said that each means is a temporary end until we have attained the goal. Each end becomes a means of carrying the activity further as soon as it is achieved. This shows that learning in his theory, and in CHAT, is looked upon as a process of growth and development with social events as an important factor interwoven in the learning processes.

For both Vygotsky (1981) and Dewey (1900), mind was not a fixed thing but an energy process of change and growth. When, for instance, pupils in school work in a project-directed way, the assessment process deviates from a mechanical goal-means approach, an approach that just looks upon the result to ascertain if the pupil has reached the listed goals through a various array of actions. In project work, the process is an important measure of the process of growth or how competencies have been developed. In this way the goals are not segregated from the process, but are rather a part of the educative process (Wertsch 1981, Postholm, Granum & Gudmundsdottir 1999). In Dewey’s (1916) opinion, this is one criterion for a good educational aim.

Dewey (1938) claimed that the environment provided the opportunity for people to have experiences that were related to familiar experiences they had been through and furthermore created consequences that people could relate to in future experiences, thus the past and present processes acquired meaning for future actions. Therefore, as we can see in connection with his central concept of experience, the past, and thus history, plays a part in Dewey’s theory, as it does in CHAT.

Everyday experiences or activities have a prominent place in both Dewey’s theory and CHAT. Leontèv said that learning often takes place in practical activities, often during everyday activities (Wertsch 1981). Dewey believed that activities in school had to be more related to life outside the school building, adding that pupils should be given the opportunity to utilize their everyday experiences in school (Dewey 1900). Vygotsky (1978) said that reading and writing must be “relevant to life” (p. 117-118). By this he probably also meant the meaningfulness of relating educational activities to real life. This was implied by his theory as a whole (Wells 1999). In this way everyday experiences are important elements in both theories.

Vygotsky (1978) developed the concept “zone of proximal development” (ZPD), defined as the difference between what one person can do alone and what he or she is capable of doing with the help of an adult or more capable peer. In the Vygotskian perspective, help from a more capable person is looked upon as close interaction during the performance of tasks. Dewey describes the teacher’s role during project work as that of an advisor for the pupils during their work (Dewey 1916, 1938). Thus here we see some differences in the way Vygotsky and Dewey comprehend the tutor’s task. In Vygotsky’s theory there is close interaction between the tutor and the pupil throughout the entire exercise. Even though Dewey does not see the tutor as controlling the activity, he thinks that there should be an interaction between the subject matter and the pupils’ interests, and thus the teacher’s role is to guide the pupils towards a goal. Dewey talks about the challenge teachers have in “psychologizing” the subject matter for the pupils, and moving them in the direction of what the expert already knows (Dewey 1902, 1916, 1938). In Vygotsky’s environment, pupils were given aims formulated by society, and due to this the classroom became a social



organization that represented the larger social community. In such cases the social organization or the greater social community is the agent of change in the individual. In Dewey's pedagogical stance, the individual could also function as an agent of change in the social organization (Glassmann 2001).

As mentioned above, the epistemological stance in both Dewey's idea-based social constructivism and CHAT is that learning, and thus knowledge construction, is created in the encounter between mind and world, in the interaction between the acting subject and the object world. When people construct and reconstruct ideas in social activity, knowledge is not presented to them, not from without nor unfolding from within. We construct our knowledge during socially mediated activity. Thus we learn through the experiences we attain from social activity, and thus we obtain more knowledge that prepares us for our encounter with demanding experiences in the future. Past experiences then help us to tackle both present and future experiences. We learn through social mediating actions that thus help us on our way to an object. This is an object that we as learners will always be on our way to, as we make our way along the path of development, because this object changes in accordance with our development. When we have reached one goal, it will then function as a means to reach another goal. Bearing in mind all the factors that are common to CHAT and Dewey's theory, as mentioned above, CHAT is thus regarded as a continuation of Dewey's theoretical stance. (Valsiner & van der Veer 2000).

### **Educational Research Framed by CHAT and Dewey's Theory**

The theories I have presented consider the learner as an active participant and, furthermore, connect the external and the internal focus on complex wholes. In CHAT and Dewey's theories the terms "Dialogue" and

"Activity" are looked upon as concepts representing a system of relations forming units of analyses. In the following I will introduce these two concepts and also discuss what consequences the two outlined theories will have for research on educational settings.

## **Dialogue and Activity**

Dewey (1916) said that the natural course of development lies in situations that involve "learning by doing" and that this purposeful doing is helped by the interplay between people and their surroundings. Dewey explained that experience is not a combination of the mind and world, but a single continuous interaction of different energies. The thinking in CHAT underscores, as mentioned above, the merging of people and their social context, and "dialogue" and "activity" have become two concepts that bring together these two entities (Valsiner & van der Veer 2000).

The focus in dialogue is on language, whereas activity in the first place brings the use of technical tools in focus. Be that as it may, both dialogue and activity can be present in the same process and these two entities are thus merged. A dialogue can be looked upon as an activity while there is no doubt that language also can play a key role when people interact with technical tools. James Wertsch, Barbara Rogoff and Michael Cole<sup>2</sup> all present theories on these entities and how

2 James Wertsch, Michael Cole, Barbara Rogoff and Yrjö Engeström all use Vygotsky's ideas in their research. Some of them regard language as the most important artefact, whereas others consider activity to be the most prominent unit of analysis. What they all have in common is their belief in the importance of context and/or environment in development and learning. That they are looked upon as a group is clearly visible in the programme of the ISCAR (International Society for Cultural and Activity Research) conference in San Diego in September 2008, where the mentioned theoreticians will all take part, either as keynote speakers or as panellists.

they give meaning to a holistic approach to human activity.

In Western culture, Wertsch is probably the theoretician who has based his theories most on Vygotsky's fundamental thoughts and ideas. Wertsch has integrated the focus on semiotic mediation, an idea developed on Vygotsky's concepts (Wertsch 1979, 1983). In his book *Voices of the Mind* (1991), Wertsch presents a dialogical perspective where he also refers to Mikhail Bakhtin's work, which he uses to analyse and understand dialogues between people. Wertsch bases his theories on the view that all social functions are social first before they become personal through the process of active transformation. This is one of the basic tenets in Vygotsky's theory and in CHAT. Wertsch took both activity and dialogue as analytical units that merge the individual and his or her social context.

As CHAT is used more and more, psychologists have most likely been led to concentrate upon activity and the study of complex, observable activity settings. By using such holistic schemes as units of analyses, they could also transcend the analysis concentrating on different parts of a whole (Valsiner & van der Veer 2000).

Rogoff (1990, 1992, 1993, 1995a, 1995b, 1996) focuses upon activity in which people and their social context are unified as the unit of analysis. During this activity a person is looked upon as active, and the social guidance given by others is seen as a complement to this person's own constructive role in his or her own development. The person is always an active apprentice who participates in socially-guided activity settings. The key point in Rogoff's theory is that people and activities mutually constitute each other. In her view, which she calls "mutually constituting", the aspects comprising a whole are taken into consideration, and these are the individual and the social-cultural influences in activities. According to Rogoff (1992), one can highlight one of

these two aspects, while also considering the other in the background, thus not losing sight of their inherent involvement in the whole.

Cole also focuses on both activity and semi-otic mediation in his cultural practice theory. In his book *Cultural Psychology* (1996), he clearly refers to Dewey's theory as he sees culture and cognition as mutually constitutive processes. Cole (1985) has also claimed that: "culture and cognition create each other" (p. 146), basing this statement on Vygotsky's thoughts and ideas.

Educational research based on social constructivist viewpoints includes complex wholes in the research focus. In the following, I reflect on what this means for the researcher in practice when conducting research within the framework of CHAT and Dewey's theory.

## Consequences for Educational Research

As we have seen, the use of tools is prevalent both in CHAT and Dewey's theory. In CHAT, learning is defined as the competence in managing to use mediating artefacts to think and act (Wertsch 1991, Säljö 1999). As we have seen, artefacts have a prominent role in Dewey's theory, where research has to focus on artefacts that are used, and what these aids mean for the pupils' learning. In the following example I introduce computers as a mediating artefact pupils use during classroom activities. The question researchers may ask is if this cultural tool can help pupils to learn more with it than without it. Do the pupils have a kind of "cognitive residue" or "effects of" using computers (Salomon 1990, 1992, Salomon, Perkins & Globerson 1991, Salomon & Almog 1998)? In this connection it would have been appropriate to use the concept of internalization for the process indicating that knowledge learnt in front of the computer also can be used in other contextual situations without a computer. Another question is whether learning

is reduced to mastery or knowing how to use computers as tools, in other words that there will be no “cognitive residue” or learning that can be used in settings without computers. In which situations does the computer appear as a helpful artefact (“effects with”) (Salomon 1990, 1992, Salomon et al. 1991, Salomon & Almog 1998), and in which situations does it not? In which situations does it even seem reasonable to think that learners can have an experience and thus acquire competencies that can be used in similar situations without the computer as a mediating artefact (“effects of”)?

In this connection “other situations” means similar situations, in other words that there is a “relation between the knowing agent and the situation” (Greeno 1989, p. 313). The same activity or task can thus be encountered in new situations. Some computer programmes demand that pupils working in a group have to argue for their choices and also combine their interests. This could for instance be the situation when pupils are editing films that are to be posted on the web. These films have to be very short because of the downloading time, and this restriction requires the pupils to decide which film shots to include and how long each of them should be. To make a decision the pupils have to argue for their choices and, furthermore, come to an agreement (Postholm 2003). The skill of arguing is also relevant for training and use in situations where pupils have to come to an agreement without using computers. This highlights the significance of teacher-mediated activities that make transfer possible (Newman, Griffin & Cole 1989).

The teacher is a central part of the learning environment or context. The teacher is the one who forms the learning environment in which the pupils think and act. Therefore, the teacher's role in the classroom is important. As we have seen, the context or situation in which actions are conducted plays a central role both in CHAT and Dewey's theory. The

choice of which mediational means to use in the classroom also depends on the teacher's beliefs in and his or her experience with them. The researcher may find that while teachers in a school community master the use of computers, they nonetheless find other cultural tools more or at least just as useful as the computer. Therefore teachers might resist the introduction of computers into the teaching processes, even though they master or know how to handle the tool. In such situations the teachers in question have appropriated knowledge about the situations in which computers are useful, and thus they might resist using them in, for them, improper settings. What can also be assumed is that teachers in other classrooms will embrace this tool and find it convenient to use in these “improper” settings. This shows that the teacher as a leader of the activities in the classroom and as part of the context for the pupils' actions can influence what technological tools are brought into the teaching and learning processes. Thus teachers can actively form the context which sets both the premises for and restrictions on the actions performed. The teacher can in this way lead the work processes through the structure he or she provides and the way he or she organizes the activities.

In both CHAT and Dewey's theory, language is looked upon as a central mediating artefact. In classrooms the teacher can organize collaborative activities between the pupils, and the teacher can also function as a close, controlling tutor (Vygotsky 1978) or an advisor (Dewey 1916, 1938), and thus guide or support the pupils during the work processes in dialogues with them. In both these situations language as a tool has a prominent role. For example, how do the pupils work and talk together in front of the computer screen, and how does the teacher help them during these processes?

If the researcher is to manage to focus on the pupils' learning, he or she has to focus the research both on the teacher as an organizer of the activities and on the collaborating and



supporting processes (Postholm 2003). This means that the research focus has to include both activity and dialogue. At the same time as the teacher is part of the actions taking place in the classroom, he or she also plays a key role in forming the contextual factors in which the actions are performed. As mentioned above, the contextual factors set the premises for and also any limitations on actions. Mediating artefacts introduced in goal-directed actions can affect the teaching and learning situation. Computers integrated in the activities in the classroom have consequences both for the teacher's role and the pupils' actions (Crook 1994, Wegerif & Scrimshaw 1997, Kumpulainen & Mutanen 1998, Postholm 2003, Walker in press).

In both CHAT and Dewey's theory, learning is looked upon as a process of growth and development. This means that the learning process has to be studied during a longer period of time. Dewey (1916) says that each means is a temporary end until the goal is attained. Thus learning depends on what has happened and, furthermore, is focused on partial goals that constitute the path of development. In this way the past and the future have meaning for actions happening here and now. The teacher has to form new partial goals (or targets) as the pupils develop. This means that the teacher has to observe the working process and plan future actions accordingly.

If the researcher is to go beyond the observed actions and expand the realist, empiricist approach, he or she has to understand the teacher's and pupils' thoughts and reflections. By interviewing the teacher the researcher can obtain an understanding of why the teacher plans and conducts the teaching the way he or she does. By interviewing pupils or asking them to answer questionnaires, the researcher also can obtain a picture of what the pupils actually have learned. Learning can be reflected in the language of the learner (Koschmann 1994). This means that recorded and tran-

scribed dialogues between pupils and between pupils and the teacher can help the researcher ascertain what the pupils have learned.

What I have said to this point indicates that learning has to be observed and studied in its developmental process. Rogoff (1990, 1992, 1993, 1995a, 1995b, 1996) states that social-cultural factors colouring the setting also have to be taken into consideration to understand the undertaken actions. Her view coincides with CHAT, where culture, history and the social aspect are included in the contextual factors (Leontev 1981, Wertsch 1981, Engeström 1999). Dewey emphasized experiences and the pupils' history created by their everyday actions in social settings. His view, as in CHAT, is that the pupils' history and the traditions in school have to be taken into consideration in the research process. This means that interviews and reading of documents are necessary data-collection strategies for obtaining a picture of the past.

As mentioned above, activity and dialogue create the foundation for a holistic approach to human activity. This means that such studies are holistic, not reducing the research to a focus on just a few aspects that are part of a complex whole. With various factors, the activity system can function as a tool for researchers, guiding them in the process of searching for a complex whole from which the studied phenomenon can be understood.

As we have seen, mediating artefacts play a key role both in Dewey's theory and in CHAT. If the researcher is to ascertain what the pupils learn by using specific artefacts, he or she will have to study the activities or processes within which these learning aids are used. This indicates that the researcher has to study learning processes in progress. In these two theories, social, cultural and historical factors are viewed as decisive factors intertwined in what happens here and now. Therefore the setting that frames the activity with its social, cultural and historical aspects has to be brought into focus.

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