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The Learning and Knowledge Creating School: Case of the Finnish National Defence College

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STATEMENT BY THE AUTHOR

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Having military pedagogical and internationally collaboratively oriented "glasses" to see the essential dimensions in our human actions I figured out that it would be reasonable to look beyond the "set of explanations" offered by military scientists, even though I belong to such a community. Now it is appropriate to thank especially professor Jarmo Toiskallio for the inspiration and all kinds of support over the troubled waters of the present study.

Already from the beginning of the research process, the paradox of the Finnish Defence Forces and the Finnish National Defence College, claiming their learning organization likeness to be at the same time an unseparable part of the evolving Finnish knowledge society, caught my attention. Especially in this case the knowledge base of the Finnish Defence Forces seemed to be in a need of expansion. When scanning our Finnish social scientific landscape, studies made by Yrjö Engeström and his colleagues offered me, and still do so, a practical, but also an intellectually challenging tool to be used while expanding the knowledge base and aiming for developmental interventions.

To be able to solve such a paradox required me to extend my sphere of interest beyond one chosen "paradigm" and the military perspective all the way to the Finnish-Japanese level. Even in our Finnish knowledge society it was impossible to be unaware of the well known person in knowledge studies – professor Ikujiro Nonaka. He and his colleagues (especially associate professor Ryoko Toyama) were the main reason for me to find contacts in Japan and have inspired me to gain more knowledge in these issues.

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Lahti, March 2006 Juha Mäkinen

ABSTRACT

The Learning and Knowledge Creating School: Case of the Finnish National Defence College

Keywords: organizational learning, knowledge creation, change laboratory, knowledge vision, teachers' on-the-job education

This research focuses on the Finnish National Defence College at the times when the claimed "learning organization-likeness" appeared in the social landscape of the Finnish knowledge society. Being managed by the methods of management by objectives and total quality management and being involved in continuous educational planning and "transformation" processes, the Finnish National Defence College has to be introduced to the synthetized instructional-pedagogical perspective in these issues.

In the Finnish Defence Forces it is currently stressed how the development of the training and education system forms the basis for competence development. This kind of statement leads us to ask what kinds of facts and principles form the basis for the development of the training and education system of the internationalizing Finnish Defence Forces.

The progressive inquiry learning process starts from the social scientific knowledge base of the Finnish National Defence College. When the main theories and theoretical interpretations are analyzed, some of them are destabilized while the knowledge base of the Finnish Defence Forces is expanded.

The knowledge-creating theories of Ikujiro Nonaka introduce the readers to the evolving field of knowledge management and innovation studies. A synthetized framework for organizational learners and knowledge creators is presented in this study. It has been made by analyzing chosen research programmes and the emerging cognitive trails made by them.

The meaningfulness of systemic thinking becomes apparent in the study, and the social system is conceptualized in the form of the activity system. The key principles of the cultural-historical activity theory are critically analyzed and put into practice in Development Laboratory meetings and in thematic interviews of the managers of the Finnish National Defence College.

The results show that an instructional-pedagogical perspective is needed in the Finnish Defence Forces and Finnish National Defence College when aiming at aligned transformations and increase of the "learning organization likeness" in the Finnish Defence Forces and in the Armed Forces in general.

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ABBREVIATIONS

AI	Artificial intelligence
BPR	Business process reengineering
CHAT	Cultural-historical activity theory
COP	Communities of practice
FBG	Finnish Border Guard
FDF	Finnish Defence Forces
FINHEEC	Finnish Higher Evaluation Council
FMES	Finnish military educational system. The FNDC and the service and branch schools together led by the Defence Staff.
FNDC	Finnish National Defence College
IKC	Innovative knowledge community
LPP	Legitimate peripheral participation
MBO	Management by Objectives
PISA	The Programme for International Student Assessment
SECI	The process of knowledge creation through socialization, externalization, combination and internalization
TQM	Total Quality Management
USMO	Paradox of being a university-scientific but also a military organization

Chapter One
INTRODUCTION

1.1. Developing the Finnish military educational system

Since the beginning of the 1990s the researcher has witnessed how the Finnish Defence Forces (FDF) have started to apply methods of management by objectives (MBO), and since 2000 how total quality management (TQM[1]; cf. business process reengineering (BPR)) have been put into practice. In the midst of these experiences a question emerged: what will be the next management approach for us and could it be probed and analyzed *beforehand* and if not, at least as it is applied?

Since 2000 the researcher has served at the Finnish National Defence College (FNDC) firstly as a planning officer[2] at the headquarters and since September 2004 in the Department of Education. The researcher has been involved in two planning processes aiming to develop the Finnish officer education (the first one in 2000–2001, and the second one from 2003 onwards) and lately more precisely the development of on-the-job-training (education) of military teachers. Hence, the practices of MBO, TQM and the development of educational practices have been merged together at the FNDC, causing unidentified consequences.

On the basis of his experiences at the FDF and FNDC the researcher *recognized inadequacies in* the current educational planning methods. Through informal discussions he came into the conclusion that such feelings were shared among his colleagues and also by some of the superiors. Further on, these kinds of opinions seemed to be emerging also in the Finnish Higher Evaluation Council (FINHEEC), which in its report of the FNDC asked what kinds of constructivist principles these educational "transformations" were based on (FINHEEC 2001, 10). Later, in the newest competence development strategy of the FDF, the question of the *main principles* came to the fore in the following form:

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[1] From 1999 to 2001 the researcher was an assessor in the Quality Competition of the FDF, and in 2001 an assessor in the Finnish Quality Competition, being relatively experienced in the quality field.

[2] At that time the researcher was a part-time teacher at the FNDC, as will become obvious during the description.

"The development of the training and education system forms the basis for the competence development"[3]. But *what kinds of facts and principles form the basis for* the development of the training and education system, which is nowadays a part of the Finnish and at the same time the European higher educational system? Could we finally use social scientific research as a tool for the developmental purposes of the military educational institution?

Despite these shared *informal* feelings and *formal* opinions the researcher met the attitude that these inadequacies are just a matter of "the way things are". According to this kind of attitude the military organizations are what they always have been and will be also in the future. And if somehow the organization will be developed, it is the undivided duty of the commander to do so. But what are the principles according to which the commanders are and will be developing our military educational system for the future and what will be the role of the teachers in these developmental activities?

Additionally, when facing the overriding technological determinism, our main task seems to be reduced to the choosing of one technological devise from many available ones. In other words we could claim that web-based education will solve the challenges of our current educational practices. But actually it will not and the forthcoming answer will not be as simple as this.

Then the researcher made the conclusion that some other perspective was needed – a scientific perspective by which to take a critical look at the current educational practices at the FNDC. He turned towards social sciences. Maybe they could offer a reasonable alternative to challenge the felt inadequacies and give answers to the *fundamental questions.* He started to scan the social reality, trying to identify some emerging themes and topics in our current society. At the same time the sphere of interest started to expand and the researcher recognized that also the Finnish society is called a "knowledge society"[4]. Also a strong claim was identified; knowledge was claimed to be *the* resource of our current reality and potentially essential also for the FNDC.

Instead of choosing a specific paradigm the researcher acted in another way. He concluded and hypothesized that he would have to try to "stand on the shoulders of the giants" (i.e. the best researchers of the field), identifying them in the field and studying chronologically

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[3] Competence development strategy; i.e. Competence Development of Salaried Personnel in the Finnish Defence Forces (2004, the English version, 5).

[4] Some others tend to claim that this is not true; instead we are living in an information society and we have to be prepared for information warfare in order to gain crucial information superiority, but where does the difference between information and knowledge lie?

how their studies have been evolving during past *decades*. During this process "interparadigmatic" debate and criticism was identified and some additional researchers were added to the ones to be closely scrutinized.

Even in our Finnish knowledge society it was impossible to be unaware of the well known person in knowledge studies – Ikujiro Nonaka. He and his colleagues are the reasons for finding contacts in Japan, inspiring the researcher to *know more* about these issues. Already in the beginning of the process the researcher felt that somehow he would have to balance the uncritical importation of international theories[5]. It is almost needless to say, but in the very beginning he had to get familiar with the knowledge base of the FNDC (i.e. military pedagogy; leadership, currently in the form of Deep Leadership at the FDF) *extending* this by the principles of some chosen Finnish civilian social scientists. Hence, Yrjö Engeström was selected and later, for various reasons, also Carl Bereiter and Kai Hakkarainen.

Already at these times the FDF started to claim how it will develop itself as a learning organization. Even by superficial reading one will recognize that the theories of Nonaka strongly criticize the Sengean learning organization theories. But how to solve the confrontation justifiably and could it be possible that learning and knowledge creation are intertwined?

The present social scientific research could be located at the intersection of the military sciences and "civilian sciences", between "national" and international social sciences but also between the working practices at the FNDC and the social scientific perspective. The audience of the present study varies, but basically the study has been made to meet international academic requirements[6] without loosing sight of Finnish military practitioners.

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[5] In Finland (but the fact seems to be true also in other nations) we rather often tend to *import uncritically* several kinds of practices and theories from abroad. In our military culture we tend to import American ones and in some spheres of life for example Japanese. In chapter 2 the critical stance will be justified as being a fundamental feature of sciences and social sciences.
[6] More specifically, this study has been made to meet the epistemic standards of the Japan Advanced Institute of Science and Technology.

1.2. A brief introduction to the case organization – the Finnish National Defence College[7]

The Finnish National Defence College[8], founded in January 1993[9], provides the training required for commissioned officer's positions in the FDF and the Finnish Border Guard (FBG)[10]. The FNDC is a profit centre of the Defence Staff supervised by the Chief of the Defence Staff with the assistance of the Chief of Personnel. The studies leading to an officer's degree are carried out in the Military Academy (formerly the First Degree Division). The students of the Postgraduate Degree Division aim at taking a senior staff officer's or a general staff officer's degree. The Continuing Education and Development Centre[11] provides continuing training and education for different personnel groups of the FDF with a university degree or for other personnel eligible for studies. Also doctoral studies in military sciences are possible at the FNDC[12]. Instruction and research are conducted in the seven departments[13] of the FNDC[14]. Since 2001 the FNDC has supervised officer studies also in the service and branch schools situated in various locations in Finland. During this analysis it will be shown what has happened and emerged due to the decisions made and in what kind of state the current social reality of the FNDC seems to be.

1.3. Research questions

The following research questions have guided this study from the beginning of the research process,

– *Who* are the subjects of learning and knowledge activities?

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[7] For additional information about the FNDC see www.mil.fi; for additional information about the FDF see www.mil.fi; for additional information about the FBG see www.rvl.fi.

[8] Located mainly in Helsinki, the capital of Finland.

[9] Then the traditional Military Academy, the Combat School, and the War College were administratively joined together in the form of FNDC, which got a university status.

[10] Also the number of civilian and international students educated at the FNDC has been increasing during the past years.

[11] On the 1st of January 2006 the Defence Forces Education Development Centre joined the FNDC and the Continuing Training Division was renamed as the Continuing Education and Development Centre.

[12] Since 2002 the researcher has studied also in the doctoral program of the FNDC.

[13] The Department of Tactics and Operations Art; the Department of Management and Leadership; the Department of Education; the Department of Strategic and Defence Studies; the Department of Technology; the Department of War History; the Department of Behavioural Sciences. Hence, the disciplines of the FNDC vary along the dimension between sciences and social sciences, extending even to the arts.

[14] Also the Central Library, the Military Archives, the Military Museum, and the National Defence Courses are combined to the *matrix* organization of the FNDC.

– *What* do they learn?
– *How* do they learn and participate in the knowledge activities?

According to Yrjö Engeström (2001a) *any* theory of organizational learning must address at least these fundamental questions. Here the idea has been cross-appropriated[15] (Spinosa, Flores & Dreyfus 1997, 4) to the field of knowledge management.

During the research process a fourth question emerged, namely

– *How* do we guide the transformation of the educational institution or is this a totally autopoietic issue?

At the moment the question of the "controllability" of the organizational development process seems to be irrelevant, but later on some supporting facts for its relevancy will be presented. In other words a challenge has been given: Are we ready to shift our thinking and face our current social reality from a more knowledgeable and pedagogically oriented angle?

1.4. Structure of the study

Chapter 2 shows the social scientific position of the researcher and justifies the decision to conduct a "multiparadigmatic" and interdisciplinary study. The researcher offers a broad view beyond "paradigms" towards research programmes and the meaning of socially navigated cognitive trails, diving into the debate on the metatheoretical and philosophical level, but without loosing touch of the theoretical and practical levels. The occasional metatheoretical stance is needed for *constructive criticism* of the chosen research programmes, and thus self-reflection of the metatheoretical assumptions will be enabled.

In Chapter 3 a short introduction of the field of educational reform studies is presented. The main point is to identify the main dimensions and primary lessons of the studies done by prestigious experts in the field of educational reform studies.

In Chapter 4 the analysis starts by criticizing the current "learning organization" interpretations at the FDF. This is made for a start by going through the main principles of the Sengean learning organization. After this the basics of the first generation knowledge management studies and a critical analysis of Nonaka's theories are

[15] Cross-appropriation means bringing practices into contexts that cannot generate them, but in which they are useful.

introduced, and the reasonability of understanding social systems begins to emerge. Then the trail goes to the main principles of cultural-activity theories, and the social system model of this study is introduced.

Chapter 5 explains how the idea of using the Development Laboratory method and semi-structured thematic interviews in this study came into being. The narrative allows the researcher to continue his reflections into the research process and its influential context.

In Chapter 6 the data gathered in the Development Laboratory meetings is analyzed in the form of a narrative. In Chapter 7 the data obtained from thematic interviews is analyzed. Some key problems and paradoxes are identified in the case of the FNDC, and they are put into a solvable form.

Chapter 8 challenges some deep-seated basic assumptions (such as the nature of learning, human being and knowledge) identified in the FNDC and playing a pivotal role in the forthcoming real transformations of the Finnish military educational system.

Chapter 9 answers the research questions and reflects on the research process as a whole.

Chapter Two
METHODOLOGICAL CONSIDERATIONS AND METATHEORETICAL ASSUMPTIONS

2.1. Tracing the essence of social sciences

We rather often tend to take for granted many fundamental issues influencing our scientific research. Here the purpose is to present some fundamental questions concerning the essence of science and social scientific research. Traditionally the epistemic authority of science has been *a priori* assumed and not just episodically won by the unique, necessary, and universal elements of its practice – behaviors, dispositions, methods, rules, tools, and languages that simply work best to make truth (Gieryn 1999, 25).

The present analysis is an even more crucial one in the "post-modern" era, where our traditional (i.e. "modern") ways of thinking have been forcefully challenged. In our "post-modern" era we seem to confront a plurality of heterogeneous claims to knowledge, and science does not have a privileged place (Giddens 1990a, 2). The only legitimate methodological principle seems to be the Feyerabendian "anything goes", favoring eclecticism[18].

But what really makes science and what is meant by the word "science", and what do these questions mean to social scientific research? For philosopher Karl Popper (1902–1994), science was unique among knowledge systems in requiring, instead of the "verifiability" criterion of logical positivists, its assertions to be *falsifiable* by some *justified methods* (Popper 1959: 2002; 1972: 1979). For the sociologist Robert Merton (1910–2003), science was distinguished by its

[16] By eclecticism the researcher means the theory and practice of selecting what appears to be the "best" in various paradigms, *lacking rigorous reflection on the metatheoretical assumptions*. Cf. e.g. Miettinen (2000a).

institutionalized norms (i.e. ethos of science)[17] and for him the word "science" denoted

- A set of characteristic *methods* by means of which knowledge is certified.
- A stock of *accumulated knowledge* stemming from the application of these methods.
- A set of *cultural values and mores* governing the activities termed scientific. (Merton 1942, 267; italics added)

For the historian[18] Thomas Kuhn (1922–1966), science distinctively moved in an oscillation between paradigmatic calm and occasional revolutions that turn upside down until a new but *incommensurable paradigm* emerges (Gieryn 1999, 26). Rationality seems to have gone out of fashion and ever since the main task of the individual researcher has been said to be to choose one among incommensurable paradigms (Kuhn 1962: 1970; Burrell & Morgan 1979).

As noticed, the specialty of science and social sciences has been challenged, but why and to what extent the criticism seems to be justifiable needs to be discussed. The analysis also gives a useful opportunity to reflect on the metatheoretical assumptions related to ontology, epistemology, human nature and methodology (Burrell & Morgan 1979; Cohen, Manion & Morrison 2000).

2.2. Extended Kuhnian approach to science and the present state of social sciences

Ahistoricality has been a widely shared feature of the standard analyses of the Kuhnian approach. Ahistoricality means overemphasis on the analysis of Thomas Kuhn's *The Structure of Scientific Revolutions*

[17] According to Merton (1942) the ethos of science comprises universalism, communism, disinterestedness, and organized scepticism. Cf. Mitroff (1974) for the "counter-norms" of these. The researcher agrees with Mulkay (1991) that these norms are understood in a varied ways among scientists, and with Gieryn (1999) that the boundaries of science on cultural maps are elastic but limited by some shared standards and features shown or not in continuous local boundary-work. According to Miettinen (2004, 113) the awareness that the results of the research will be evaluated by the scientific community encourages researchers to maintain a respectful social scientific position. For sociological analysis of the roots of science see Zilsel (1942: 2000). According to Zilsel (935–937) the rise of science was imbedded in the advance of early capitalist society, which weakened collective-mindedness, magical thinking, and belief in authority and which furthered worldly, causal, critical, rational, and quantitative thinking.
[18] Gieryn (1999, 26) introduces Kuhn as a historian, although Kuhn received a Ph.D. in psychics at Harvard University in 1949 and remained there as an assistant professor of general education and history of science. In 1956 Kuhn accepted a post at the University of California, Berkeley, where in 1961 he became a full professor of history of science. Therefore, originally Kuhn was a scientist and not a social scientist. Consequently, Kuhn does not give much room for explanations concerning the social sciences focusing mainly on the science.

(1962: 1970) and especially the concept of the paradigm. Consequently, a broader view of the scientific landscape has been lost from sight and mind. Here it is stressed that the main question is not to change the unit of analysis but to get a broader view[19].

To get a broader Kuhnian perspective, the distinction between periods of pre-paradigm, paradigm (normal science) and post-paradigm of science needs to be remembered. Kuhn means that scientific research without "incommensurable" paradigms could be possible especially in the pre-paradigm stage of the scientific progress. To Kuhn the pre-paradigm period is characterized by *interschool (pre-paradigm schools) debate on the fundamentals.*

For the social scientists the positioning of the social sciences on the broader map of Kuhn is crucial because it reminds of an open question: What parts of social science have so far acquired *such paradigms*[20] (Kuhn 1962: 1970, 15; cf. Thagard 1992; Turner 2001; Bereiter 2002) and how could we as social scientists proceed towards the stage of normal science, or should we? Where do we find the Kuhnian debate on fundamentals (i.e. about metatheoretical assumptions) done by social scientists themselves?

The Kuhnian approach seems to fit well to our "post-modern" era, as he explains some potential reasons for the lack of scientific progress. Presently, the fundamental question is claimed to be W*hich of the "paradigms" do you choose* (cf. Burrell & Morgan 1979)? The question is challenging, when remembering that the Kuhnian scientist has been traditionally understood to be an irrational one lacking a higher set of commitments or metaparadigmatic criteria. The offered proposal is also problematic when looked at from the perspective of the social scientific progress: are we focusing just on the *choosing* and taking for granted the "unavoidable" *communication* problem?

By the communication problem the present researcher means the possibilities and limitations of communication between different "paradigms" or pre-paradigm schools. One reason for the communication problems is the *path-dependency* of the understanding. Kuhn refers to this issue when explaining that the

[19] Referring to the analysis of Margaret Masterman (1964) Thomas Kuhn admitted (1962: 1970, 174) the ambiguous use (at least twenty-two different ways) of the concept of paradigm. But not even the Kuhnian elaborated disciplinary matrix or Lakatos' concept of the program of research (cf. Wartofsky 1979, 133) or even the research programme necessarily show a straight way out of this ambiguousness.

[20] The sense and meaning of paradigms readable also in Kuhn (1962: 1970) are highly different than in current social sciences. The time frame of Kuhn should be recognized when trying to understand the essence of paradigms. Kuhn's time frame varies from decades to many centuries when *real* incommensurability seems to be a justifiable alternative between e.g. "Ptolemaic" and "Copernican astronomy" or "Aristotelian" and "Newtonian" dynamics. Hence we could talk about Kuhnian paradigms and "paradigms".

meaning of a theory depends upon what courses the researcher has had, what texts he has read, and which journals he studies (Kuhn 1962: 1970, 50).

When emphasizing, as the present tendency seems to be, the interparadigmatic communication difficulties one needs to identify the paths followed by the scientists in the field in question. It is argued that sociological theory and social scientific theories have been profoundly affected by the use of metaphors, especially spatial metaphors, which still remain a rather implicit and underutilized feature of contemporary social scientific thinking (Silber 1995; cf. Gieryn 1999). The rather implicit use of spatial metaphors is obvious also among the chosen research programmes (cf. e.g. Hutchins 1995, 169; Engeström 2001b; Engeström 2004c, 444; Rainio 2003[21]; Hakkarainen, Lonka & Lipponen 2004, 145–146), needing to be recognized and put into an extended use by those navigating in a cultural environment.

The second reason for the communication difficulties is said to be the lack of shared language. Kuhn has clarified his *incommensurable-thesis* by saying that "the claim that two theories are incommensurable is then the claim that there is no language, neutral or otherwise, into which both theories, conceived as set of sentences, can be translated without residue or loss" (Kuhn 1983, 670). Comparing this statement to the identified set of research programmes will be useful. Do the chosen social scientists share some sort of language and to what extent do they seem to understand the other "paradigms"?

Before entering this kind of analysis, we should pay attention to Trevor Pinch (1982: 1997), who claims that two distinct interpretations of Kuhn's ideas have emerged among the sociologists of science. One is a "conservative" and the other a "radical" interpretation. Within the "radical" interpretation incommensurability has been taken to refer to the impossibility of finding rules of scientific rationality by reference to which it is possible to read off the progress of one "paradigm" over another. This interpretation has led to an explicit embrace of the epistemological relativism with regard to scientific knowledge. If one "paradigm" (pre-paradigm school) cannot be said to be an advance of another in terms of criteria of scientific rationality then all "paradigms" are equally valid. Let us see whether the conservative interpretation is justified in the present analysis.

One of the most prominent critics of the Kuhnian approach was Imre Lakatos (1922–1974) who was restoring the rationality of the scientific progress. He insisted that the history of science has been and should be a history of competing research programmes, but it

[21] A master's thesis made in Finnish, supervised by Yrjö Engeström.

has not been and must not become a succession of periods of normal science: the sooner the competition starts, the better for the scientific progress. (cf. Lakatos & Musgrave eds. 1970; Lakatos 1978)

To restore the rationality of science Lakatos emphasized competition and required continuous progress. Compared to Kuhn, Lakatos did not offer us a period of "normal science" where the scientists of the "paradigm" could rest on their laurels avoiding interprogram debate on the fundamentals and lacking any higher sets of commitments (Kuhn 1962: 1970) or super-paradigmatic (meta-paradigmatic) standards (Lakatos in Lakatos & Musgrave eds. 1970).

According to Kuhn the decision to reject one paradigm is always simultaneously a decision to accept another, and the judgment leading to that decision involves the comparison of both paradigms with nature[22] and with the other (Kuhn 1962: 1970, 77). But is the choice totally irrational or did also Kuhn admit the existence of some kind of "selection criteria"?

Actually also in the original edition of Kuhn's *Scientific Revolutions* (1962: 1970) he admits that scientists do share some rules, value systems, higher sets of commitments and essential characteristics among themselves. According to Kuhn the relative importance of these features is raised during the period of pre-paradigm and in crises before scientific revolution, but we should not forget these mores even in the period of "normal" science.

In his postscript (1962: 1970, 185) Kuhn gives some examples of the shared values to be used when choosing theories (simplicity, self-consistency, plausibility, and compatibility) but later after *learning*[23] a little bit more he gave more attention to them, as can be seen below:

- Accuracy: Within its domain a theory should be in demonstrated agreement with the results of existing experiments and observations.
- Consistency: A theory should be consistent, not only internally, but also with other currently accepted theories applicable to related aspects of nature.
- Broad scope: A theory's consequences should extend far beyond the particular observations, laws, or subtheories it was initially designed to explain.
- Simplicity: A theory should bring order to phenomena that in its absence would be initially isolated.

[22] The same idea seems to be applicable also for social scientists due to the fact that "paradigms" or research programmes should be compared with the social reality.

[23] Kuhn's case highlights illustratively how an individual scientist *can* also *learn.* The general tendency seems to be neglecting this fact and instead of following paths and trails "walked" by the scientist and offering a panoramic view of the field some snapshots are offered. Some examples may confirm the fact; cf. e.g. Sarason (2002); Neisser (1994).

– Fruitfulness: A theory should be fruitful of new research findings by disclosing new phenomena or previously unnoted relationships among those already known. (Kuhn 1977, 321–322)

Although tacitness and the need to continuously reflect on "shared values and mores" are the most important aspects, also the explicitness of these features should not be forgotten while we maintain the boundary between science and other public spheres. Two of the criteria mentioned above need to be highlighted: consistency and accuracy. For social scientists consistency means both internal and external consistency with other currently accepted theories in a chosen field (i.e. organizational learning and knowledge management). The practical meaning of accuracy could be said to be a "fit" between a theory and the social reality in question. For social scientists accuracy means a continuous need to collaborate with "lay people". This issue will be discussed later in this analysis.

2.3. Change of scientific activity in contemporary societies

Is it possible that the values, mores and principles of scientists are only historical relics that are changing in our contemporary global societies? A multinational research group, led by Michael Gibbons (Gibbons, Limoges, Nowotny, Schwartzman, Scott & Trow 1994) [24], offers a view on how the scientific field seems to be changing. They explain that a new form of knowledge production (Mode 2) is emerging alongside the traditional (Mode 1), familiar one. Mode 1 operates within a hierarchical disciplinary framework controlling the diffusion of the Newtonian model (empirical, positivistic) to more and more fields of enquiry. Mode 2 is transdisciplinary[25], involving the close interaction of actors from various spheres of life throughout the process of knowledge production.

Being discipline-based, Mode 1 is said to carry a distinction between what is fundamental and what is applied. This implies an operational distinction between a theoretical core and other areas of knowledge such as the engineering sciences, where theoretical insights are translated into applications. By contrast, Mode 2 is characterized by a constant flow back and forth between the fundamental and the applied, between the theoretical and the practical. Researchers of

[24] Cf. also Nowotny, Scott, Gibbons (2001).

[25] Transdisciplinarity means research involving researchers from two or more disciplines and also practitioners. Here interdisciplinarity, in turn, means a research involving two or more scientific disciplines, being a form of transdisciplinarity.

Mode 2 do not tend to search for fundamental principles but are oriented towards contextualized results. (cf. Gibbons et al. 1994, 19) Consequently, Mode 2 makes use of a wider range of criteria in judging quality control.

Why is the shift from Mode 1 to Mode 2 happening and what is the driving force behind the claimed progress? The emergence arises out of the existing dysfunctionalities and breakdowns of disciplinary modes of paradigmatic problem-solving (Gibbons et al. 1994, 29). The main problems of the practitioners may not be locatable on the prevailing disciplinary map, but on the other hand the emergence can be explained as resulting from wider societal and cognitive pressures. For example, if Mode 2 is said to be an example of a constant flow between the theoretical and the practical, why is this feature said to be missing from Mode 1, especially if Mode 1 has tried to keep practical ends in mind while gaining a better understanding of the physical and social world?

According to Gibbonsians the shift from Mode 1 to Mode 2 could be explained also by some endogenous factors. One of these has been mentioned already – cognitive pressures of the individuals and research collectives in cases when wider societal needs are recognized to be unmet. The other is the need to balance competition (science wars) by increasing cooperation.

Gibbons, with his colleagues, has emphasized that the density of communication between scientists is an important factor in accelerating knowledge production. Referring to Becher (1989) they compare the "urban mode" of communication, which is seen as characteristic of hard sciences, with a "rural mode", which is characteristic of soft sciences (social sciences) (Gibbons et al. 1994, 40). In the "rural mode" problems considered worth working on are much more numerous and widespread. If then transdisciplinarity is arising, common theoretical understanding and mutual interpretation of disciplinary epistemologies or even all kinds of metatheoretical assumptions need to be discussed on each field of research, and not just nationally but also internationally, because ultimately science and social sciences are global activities (cf. Merton 1942; Zilsel 1942: 2000; Gibbons, Limoges, Nowotny, Schwartzman, Scott & Trow, 1994, 40; cf. also the claimed diversity of epistemic cultures, Knorr-Cetina 1999).

The importance of discourse to scientific progress was brought out strongly by Karl Popper and further developed by Imre Lakatos. As mentioned above, its importance arises from the recognition that scientific theories cannot be verified, as logical positivists insisted; theories can at most be falsified. Therefore, scientific progress either arises or not from continual criticism and efforts to overcome criticisms

by modifying or replacing theories. Carl Bereiter has explained that a progressive scientific discourse has some main moral commitments:

– To work toward common understanding satisfactory to all (the mutual understanding commitment).
– To frame questions and propositions in ways that allow evidence to be brought to bear on them (the empirical testability commitment).
– To expand the body of collectively valid propositions (the expansion commitment).
– To allow any belief to be subjected to criticism if it will advance the discourse (the openness commitment) (Bereiter 1994, cf. Bereiter 2002; Gieryn 1999[26]).

If then Mode 2 uses a wider range of criteria in judging quality control, does it abandon the norms of Mode 1? Not necessarily. Although the differences between Mode 1 and 2 have been highlighted, this does not mean that scientists of Mode 2 are or should be forgetting the norms of scientific methods. Instead, the emergence of Mode 2 means that some *additional criteria*[27] need to be put in use.

2.4. Walking along the cognitive trails and paths of social sciences

As mentioned above, *paths* were the preferred metaphor for both Kuhn and Lakatos when explaining the essence of scientific research. According to Kuhn the path could be identified by following the texts the scientist has read and the journals he has studied. It is justifiable to add that it needs to be asked with whom and in what kind of context he has done his research, not only on individual but also on collective ("paradigm" or research programme) level.

It was explained above that social sciences are currently immersed by the use of spatial metaphors and that we tend to be unaware of this fact. It was also emphasized that by using these kinds of resources more consciously we could better understand how we conduct our research processes, "moving" in our cultural environment. Now it seems to be appropriate to turn the attention to the *path* metaphor.

[26] Gieryn (1999) suggests the possibility of a win-win game instead of the traditional zero-sum game in case of science wars ("incommensurability crisis").
[27] Gibbons et al. (1994, 18, 33) name efficiency and usefulness as additional criteria, which are defined in terms of the contributions the work has made to the overall solution of transdisciplinary problems.

Adrian Cussins' theory of cognitive trails is a philosophical critique of and alternative to various forms of conceptualism (Engeström 2001b, 4) and tries to answer the fundamental question: What are the distinctive ways in which the world is made available for us (cf. Cussins 2003, 149)? Cussins' theory of cognitive trails (Cussins 1992, 1993, 2003) is an analytical tool to make sense when we are "walking through our reality and world". For a start it is useful to recognize the *stabilized* meanings in our cultural-historical global society (i.e. cultural environment). During our history scientists and practitioners alike have looked at phenomena that have been in a flux; they have drawn "lines" ("built boxes", "black boxes"; they have conceptualized the reality) around phenomena, so that the phenomena have entered cognition in a single act of reference (cf. e.g. Bowker & Star 1999). In other words they have made *cognitive trails* to be followed in order to reach our goals and develop our competences. Consequently, in our society there exist hierarchical *networks of trails* and *intersections* (e.g. landmarks).

Before continuing, the concept of cognitive trails needs to be explained. According to Cussins trails are

> both person made and world-made, and what makes persons and worlds. Trails are in the environment, certainly, but they are also *cognitive* objects. A trail isn't just an indentation in a physical surface, but a *marking* of the environment; a signposting for coordinating sensation and movement, an experiential line of force. Hence the marking is *both experiential and environmental ...* perhaps trails are the first tools." (Cussins 1992, 673–674)

Cognitive trails simultaneously guide those who follow them, and in the very act of guidance are themselves shaped (by destabilizing acts, but this issue will be discussed below). This means that trails are both individually and/or collectively followed. Trails exist in ontologically distinct kinds of regions: on the ground certainly, but also in social, theoretical, linguistic, biological, psychological, and historical regions. Hence, trails can be global, yet they are built and maintained locally in a fully distributed manner. (cf. Cussins 2003, 157)

Trails are followed to increase the likelihood of getting jobs done effectively, because by doing so the individual can extend his competence (degree of perspective-dependence (PD-ratio)) (Cussins 1992). In case of strong perspective-dependency the PD-ratio is close to zero and when perspective-*in*dependency increases the PD-ratio comes closer to one. Ultimately, when the PD-ratio is one, the zone of competence has spread to fill the whole territory (i.e. our cultural environment). In these cases there are no privileged positions, wherever the goal is located. There are many ways in which the system can

maximize its PD-ratio. The system could follow many possible routes to the goal by mastering many landmarks (e.g. intersections) being equipped with certain search skills (i.e. skills for progressive inquiries).

Cussins explains that renegotiation of meaning (*destabilization)* may be required and it is possible to do so. The destabilization may be required by a new social setting (cf. cultural evolution), or because of the changing demands of the language user's project (e.g. the research questions needing to be answered), or otherwise because the concept eventually breaks down (Cussins 1992, 680).

Cussins' individual could be normatively guided by two kinds of guidance (Cussins 2003, 156–157). At least he is guided by the mundane norms of the activity-space around him. The mundane norms tell him what is right and what is wrong, what is on the path and what lies outside the path. For a scientist a shared set of cultural values and mores are examples of mundane norms. For an individual it is possible to be guided also by elite norms. One example of an elite norm of a scientist is the "truth"[28]. Obviously Cussins puts some philosophical flesh on the bones offered by Kuhn and Lakatos, but what these theories mean in practice needs to be asked and answered.

2.5. Navigating socially in our global science society

In the mid 1980s and early 1990s two new disciplines, computer-supported cooperative work (CSCW) and computer-supported cooperative learning (CSCL), emerged out of the field of human-computer interaction (HCI). The concept of social navigation is part of this movement, and it was introduced by Paul Dourish and Matthew Chalmers in 1994. For them social navigation means a phenomenon in which a user's navigation through the information space is primarily guided and structured by the activities of others within that space[29] (cf. Munro, Höök & Benyon eds. 1999; Höök, Benyon & Munro eds. 2003; Benyon, Turner & Turner 2005).

"Social" navigation is contrasted to "spatial" and "semantic" navigation. For instance, imagine browsing in a bookstore. If you pick

[28] According to Cussins truth not only governs the activity of the scientists but is also constitutive of the activity of science. If then after some research process you have listed all the reasons for believing some statement, why would you need to add "an elevator word": because it is "truth"? (Hacking 1999). From this transparadigmatic framework also Engeström (1987) has criticized the constitutiveness of the truth for science as activity. On the other hand both Nonaka (with Takeuchi, 1995) and Bereiter (2002) favour the "truth".

[29] In a way Cussinsian cognitive trails could be understood as existing in an information space under the stabilizing and destabilizing acts of social navigators.

up a new book because it is sitting on the self next to the one you have just been examining, then you are navigating spatially. If you pick up another book because it was referred to in a citation in the first book, then you are navigating semantically[30]; and if you pick up yet another because it was recommended to you by someone whose opinion you trust, then you are navigating socially. (cf. Dourish, 19 in Munro et al. 1999)

All the above forms of interaction make sense for a researcher, although they have some limitations. It is essential to *balance* all the forms of interaction, although social and semantic navigation are more recommendable (cf. e.g. Hakkarainen et al. 2004, 145) also for social scientists. Following cognitive paths does not necessarily mean that we reduce ourselves to "ant-like creatures" (idea coined by Herbert Simon; cf. Hutchins 1995, 169 extending the idea; Hakkarainen et al. 2004, 145–146). Obviously in our cultural environment there lie cognitive trails inside, but more interestingly *between* disciplines and researchers or practitioners alike. We often tend to be unaware of these cognitive trails while we may even be following them! In some occasions, being aware of these trails, we prefer to choose and stick around the chosen "paradigm" and discipline instead of using the trails at our disposal. Or if we have a permission to follow a trail, do we have the needed energy and motivation to do so? In the same manner we could be nationally unaware of the international and global paths (not only networks) along which we import tools for sensemaking, understanding and competence development. Currently, and even more in the future, we will be not just allowed but *demanded* to follow these cognitive trails *globally* while we seek answers to our current problems with the practitioners.

During the present research process both the individual and collective abilities of the FNDC to navigate socially have been extended by trying to master many respected cognitive trails made by the researchers in the field of organizational learning and knowledge management. The main cognitive trails (research programmes) followed in this research are:

1. Social scientific theories of Finnish Defence Forces (military pedagogy by professor Jarmo Toiskallio et al.; also leadership and management studies).
2. Professor Ikujiro Nonaka with his disciples.
3. Professor Yrjö Engeström and the cultural-historical activity theory in general (CHAT).
4. Professor Carl Bereiter and his colleagues (e.g. Doctor Kai Hakkarainen with his colleagues).

[30] Searching knowledge bases by the chosen concept or word could be seen to be one form of semantic navigation.

One reason for choosing so many research programmes was the need to gain more explanatory power. In brief, in this field of organizational learning and knowledge management the chosen researchers with their references cover an excess of corroboration which causes an increase of explanatory power (Popper 1959: 2002; Lakatos 1970). In other words these research programmes are the most theoretically ambitious and also practically relevant alternatives both for global and local use in the present field. In order to search for the "truth" and to answer the research questions, the study goes beyond the chosen programmes[31], climbing "up" to the metatheoretical and philosophical levels. The occasional metatheoretical stance is needed simply because only by doing so justifiable *constructive criticism* of the chosen programmes can be done in a justifiable manner[32].

As a starting point for the research, the military pedagogical theories and practices of the FNDC have been carefully analyzed. The researcher has worked at the FNDC since 2000 and during that time he has been following the stabilized trails of military pedagogy in order to identify its possible weaknesses and to destabilize it if needed. At the same time the Finnish Defence Forces aim to develop their operating culture based on the principles of the "learning organization" (Finnish Security and Defence Policy, 2004), but what do these principles mean to the FNDC? During past years the educational practices of the college have faced continuous rearrangements. The question is, what kind of principles have these "transformations" been based on (FINHEEC 2001, 10)?

At the moment Europe, as well we Finns, seems to be catching two birds with one stone: advancing European integration also in security issues and re-balancing the transatlantic link with the United States. At these times it is hard to anticipate other than increasing internationalization in social and military scientific research. The present research aims to be a tool for the deepening internationalization within the Armed Forces.

The researchers and practitioners of the Finnish Defence Forces have already gained lots of fruitful experiences of the deepening internationalization. The international development of military pedagogy since the 1920s gives an example of this point (Toiskallio ed. 2000, 2004; Florian ed. 2002).

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[31] In Cussinsian words there exists a landscape without "any paths" at all: some parts of our current social reality seem to lie on a periphery, partly, if at all understood at least from the perspective of the chosen research programmes. The paths need to be walked but occasionally new paths need to be made.

[32] In other words the present study is practical, theoretical and also metatheoretical at the same time.

2.6. Social scientifically reflecting on researcher's metatheoretical assumptions

While following the chosen cognitive trails the metatheoretical assumptions have been recalled, occasionally reflected upon and elaborated. Consequently, the assumptions have evolved when the understanding of the researcher has increased. Despite this fact only the present state of the metatheoretical assumptions will be explained below.

According to Burrell and Morgan (1979; cf. Cohen et al. 2000) it is convenient to conceptualize social science in terms of four sets of assumptions, which are related to human nature, ontology, epistemology, and methodology. Together this kind of set could be called metatheoretical assumptions.

Referring to Mouly (1978), Cohen, Manion and Morrison (2000, 3) state that when people try to cope with their environment the means used in these occasions can be classified into three broad categories: experience, reasoning and research. It is often said that in our present world there exists a deep tension between science and experience. Science seems to be so dominant that we tend to give it the authority to explain even when it denies what is most immediate and direct – our everyday, immediate experience. Scientific accounts are seen to represent fundamental truths while our immediate experiences are seen as less true.

Varela, Thompson and Rosch (1991, 14) emphasize the need to cross over the rift between science and experience – experience and scientific understanding are like two legs without which we cannot walk. Often the rift is exemplified as occurring between "everyday thinking" or "non-rationality" and "scientific thinking" or "rationality". According to Jean Lave (1988, 77) the characteristics associated with everyday thought have been merely transposed from the arena of cross-cultural to intra-cultural social categories and relations without changing their basic content. Instead of creating a wrong functional opposition between two kinds of psyche we should understand the unitedness of them (Vygotsky 1978; Leont'ev 1978, 1981; cf. chapter 4).

On the other hand it is possible to sustain the distinction between "scientific rationalities", and the "rationalities of everyday"; but not without any reservations, or by *a priori fixed demarcations* (Barnes, Bloor & Henry, 1996) as has been done traditionally (Giddens ed. 1975). After the naturalistic turn (Mulkay 1991; Barnes et al. 1996; cf. Hacking 1999) of the science studies in the late 1970s the difference between

lay people and scientists has been harder to accept because the sociologists of science have become so successful at dissolving dichotomies and classes that they no longer dare to construct them (Collins & Evans 2002). Nevertheless, we cannot forget the possibility that some kind of scientific ethos *could be* shared by the social scientists, ultimately in an *a posteriori* manner, showing how the difference between the science and other spheres of life could at least occasionally still exist. Later in this chapter[33] and also in chapter 8 the essence of human nature of scientists and lay people alike will be discussed further.

Secondly, there are assumptions of an ontological nature – assumptions concerning the very nature or essence of the social phenomena being investigated. To what extent can the reality be seen as given "out there" in the world, or is it totally created by one's own mind? In the field of social sciences the avalanche of social constructivism was launched partly by the influential book of Peter Berger and Thomas Luckmann (1966) *The Social Construction of Reality.* Another influential name in social sciences arguing (as often has been insisted) that "reality could be socially invented" is Ernst von Glasersfeld – the founding father of radical constructivism. Maybe they could explain to us how reality is constructed or invented by us?

Berger and Luckmann (1966) did not stake a claim for any form of universal constructionism (cf. Hacking 1999). They explained that *the paramount reality (natural environment)* envelops multiple realities of everyday life (Berger & Luckmann 1966, 25). These multiple social realities interact with the natural environment when consciousness always returns to it.

Also Ernst von Glasersfeld did not deny the existence of natural reality, but he saw it "differently". He claimed that the reality remains forever behind the points of conceptualizations[34]. Always, sooner or later, the knowledge constructed by us does not fit the reality; our conceptualization fails and we have to make a better one. Metaphorically speaking, as von Glasersfeld did, reality is a lock and our knowledge is a key that unclocks possible paths for us. But the success of a key does not depend on finding a lock into which it might fit, but solely on whether or not it opens the way to *the particular goal* we want to reach. (von Glasersfeld 1984, 1995; italics added)[35]

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[33] When criticizing the "positivistic stance".

[34] Cf. Pollack (2003, 5) on how our scientific investigations are enveloped with *uncertainty* at every stage.

[35] cf. Von Glasersfeld's argument, quoted in Phillips (1995) "Superficial or emotionally distracted readers of the constructivist literature have frequently interpreted this stance (the radical constructivism) as a denial of "reality".

It is essential to see natural and social reality as both separate and interactive entities. For us this means that human beings have created social reality during the cultural evolution (Tomasello 1999; Berger & Luckmann 1966). The natural reality *limits* our social reality. Both our natural reality and our social reality *resist* scientists' efforts to bring up their goals. The goals, plans, models, material agency and social organization tend to be interactively transformed in the mangle of practice (Pickering 1995).

The realities are multilayered scientifically and social scientifically conceptualized by hierarchic disciplines. Already Auguste Comte (1798–1857)[36] envisaged that sociology is going to be the Queen in the hierarchy of scientific disciplines. The mechanism of scientific development provides the key to the logical relations between the sciences. The earliest sciences to come into being are those dealing with facts of the greatest generality; thus each field of study in the hierarchy of the sciences is predicated upon those lying below it, although its own concepts and generalizations are irreducible. (Giddens ed. 1975, 1)

Undoubtedly the Comtean vision of the hierarchy of sciences has been challenged by many scientists but nevertheless each discipline has its "main domain" (Kuhn 1962: 1970; Lakatos 1970); a part of natural or social reality[37] on which to concentrate. Michael Polanyi (1966, 36) explains this multilayered reality interestingly by saying that these levels *form a hierarchy of comprehensive entities*, the principles of each level operating under the control of the next higher level. Each level is subject to dual control: first, by the laws that apply to its elements in themselves, and second, by the laws that control the comprehensive entity formed by them. Also Polanyi did not deny the differences between the systemic levels but claimed that actually these levels are not reducible to the terms of the lower level. Gilbert Ryle (1949, 16) speaks about a category mistake, meaning that applying concepts to logical types to which they do not belong should be avoided. This does not mean that other disciplines should not serve as a source of metaphors, analogies and models as the history of the science shows (see metaphors and analogies, Ortony ed. 1979: 1993; Bono 1990; Turner 1996; Morgan 1997; Turner 2001) but where do the limits to such a cross-appropriation lie? Therefore, there is a difference between what something is said to be literally and what it is metaphorically speaking[38]. As a conclusion it could be clarified that

[36] August Comte is the "official" founder of sociology. Collins (1994); Giddens ed. (1975).
[37] This part of reality or a domain could be defined either conceptually (i.e. knowledge science) or "non-conceptually" (i.e. psychology or biology).
[38] Although metaphors are more fundamental than this example shows, we cannot forget this basic difference between "literal" and "metaphorical".

the ontological position taken in this study is more realist than nominalist[39] in the sense described by Burrell and Morgan (1979, 4; cf. also Cohen et al. 2000).

The third set of assumptions identified by Burrell and Morgan is of an epistemological kind. How one aligns oneself in this particular debate profoundly affects how one will go about uncovering knowledge of social behaviour. The (positivist) view that knowledge is hard, objective and tangible will demand *an observer's role* of researchers, together with an allegiance to the methods of natural science. To see (anti-positivist) knowledge as personal, subjective and unique, however, imposes on researchers *an involvement* with their subjects and a rejection of the ways of the natural scientists. (Cohen et al. 2000)

According to Giddens (1975, 3–4) the "positivistic attitude" in social sciences may be said to comprise the following connected suppositions:

- The methodological procedures of natural science may be directly applied to social sciences.
- The end-product of investigations can be formulated in terms parallel to those of natural science (law-like generalizations).
- Social sciences, as natural science, are "neutral" with respect of values, providing knowledge which is purely "instrumental" in form.

The precise target of the anti-positivists' attack has been the mechanistic and reductionist view of nature by science, which excludes notions of free will, subjectivity, and moral responsibility. The sociological perspective on the human nature comes in different flavours: the dimension between "subjectless" versus more "subject-centric" sociological theories has kept its pivotal position.

It is useful to start with Niklas Luhmann's "subjectless" sociological theory (Luhmann 1995; cf. Tuomi 1999, 256). Luhmann sees society as a self-referential (Maturana & Varela 1980) system with communications as its elements. According to Luhmann human beings are a part of the environment of the society (instead of a part of the society itself). This does not mean that the human being is estimated as less important than traditionally. The (social) system is first set in motion and orients itself by the question *asked or not* by the individual human being: "W*ill the partner accept or reject a communication?"* In principle also Luhmann's person can control his behaviour (he has relative autonomy) and doing so means that he can also remain silent.

[39] According to Burrell and Morgan, for the realist the social world exists independently of an individual's appreciation of it. The individual is seen as being born into and living within a social world which has a reality of its own. The nominalist does not admit that there is any "real" structure to the world which these concepts are used to describe. Cf. also Hacking (1999).

The structuration theory of Anthony Giddens (1984) gives an example of a relatively "subject-centric" sociological theory. Crucial to the idea of structuration is the theorem of the duality of structure: the structure is always both constraining and enabling, instantiated in social practices, and *partly controlled* by individual actors. Giddens' human actors are knowledgeable to some extent. The knowledgeability is always bounded on one hand by the unconscious and on the other hand by unacknowledged conditions/unintended consequences of action.

When seeking for alternatives to positivistic social sciences, one traditional rift has to be kept in mind: the rift between science and experience (Varela et al. 1991). Especially positivistic social science has failed to take into account our unique ability to interpret our experiences and present them to ourselves (Giddens 1984). The social sciences are not insulated from the social world in the way the natural sciences are from the natural world. Hence, the social sciences enter into the very constitution of the social world *transforming* their own objects by *a double hermeneutic process* (Giddens 1984, 1990a, 2001[40]; cf. also Habermas 1984; cf. also Rynes, Bartunek & Daft 2001).

For the social scientist the double hermeneutic process means that he operates at the intersection of two frames of meaning: one is the meaningful social life as constituted by lay actors and the other is the social scientific worldview expressed in theories (metalanguages) invented by social scientists. According to Giddens (1979, 1984) the "positivistic attitude" in social sciences has been seen as uninhibited applying of the revelatory model of the natural sciences to the social sciences. The main task of the researcher has been seen to reveal the flawed common sensual beliefs to be corrected by scientific theories and observations. In this attitude the researcher *imposes* the theories on the lay beliefs, correcting them in the process.

Later, after the overall shift in the social sciences from the positivistically oriented research towards more interpretative approaches have taken place, some sort of paralysis of the critical will seems to be a widely shared imperative. Often the interpretative approaches have juxtaposed social science and common sense, claiming that no kind of critical evaluation of beliefs or practices is possible where such beliefs and practices form a part of an alien cultural system (Giddens 1979).

A way out of this impasse, between the revelatory model and uncritical stance, can be seen lying on one hand in a respect for the

[40] Sociology seems to come up with findings we knew already. According to Giddens (2001) we tend to be unaware that sociological research continually influences what our commonsense knowledge of society actually is (cf. Wenger 1998, 295).

authenticity of lay beliefs and on the other hand in a critical evaluation of the justification of common sense beliefs[41]. The main role of the social sciences as regards the critique of common sense beliefs is the assessment of reasons as good reasons in terms of knowledge either simply unavailable to lay agents or construed by them in a fashion different from that formulated in the metalanguages of social theory. But what can be seen as "good" or "bad" depends partly on the chosen frame of meaning (the social scientific or the one of the lay actors). For social scientists this means the need to gain shared understanding with the lay actors and possibilities to explain convincingly the claimed "goodness" or "badness" of the lay activity to the lay people but also to other social scientists. Consequently, in the research process knowledge should spiral in and out of the social life, reconstructing both itself and that social life as an integral part of the double or even a triple hermeneutic[42] process.

For a social scientist, seeking appropriate alternatives for positivistic social sciences means that it is not anymore appropriate to restrict his interests to be "less than emansipatory" interests[43]. Instead of unawareness, the social scientist needs to be aware of his responsibilities to enable some "bad" to turn into "good". This is not just a possibility for him but it is also a moral responsibility of social scientists (cf. e.g. Ziman 1998; Schweber 2000).

The inevitability of consequences (i.e. intended and unintended) does not mean that the social scientist should partly act as the interpretive social scientist as explained in the quotation below:

> The purpose of social science is to understand social reality as different people see it and to demonstrate how their views shape the action which they take within that reality. Since the social sciences cannot penetrate to what lies behind social reality, they must work directly with man's definitions of reality and with the rules he devises for coping with it. While the social sciences do not reveal ultimate truth, they do help us to make sense of our world. What the social sciences offer is explanation, clarification and demystification of the social forms which man has created around himself. (Beck 1979 quoted in Cohen et al. 2000, 20)

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[41] Additionally, the critical evaluation of scientific facts and beliefs also comes to the fore.

[42] Lay people, military scientists and civilian scientists having different kinds of frames of meaning.

[43] According to Jurgen Habermas (1972; cf. Cohen et al. 2000, 29) the knowledge constitutive interests are "technical" (positivist methodologies), "practical" (interpretive methodologies) and "emansipatory" interests (critical methodologies). The "emansipatory" interest *subsumes* the other interests guiding the researher to go "beyond" technical and practical interests.

The traditional positivistic researcher tends to adopt an objective stance towards his research objects but the anti-positivistic researcher has to recognize his responsibility in an *unavoidable* influence on the research object. The interpretatively oriented social scientists could have been taking the side of either the underdogs (bottom-up approach) or the ruling actors (top-down approach); but who are the rulers and who are those ruled in our global society?

Traditionally the researchers of the interpretive "paradigm" have tended to examine situations through the eyes of multiple participants, describing the social reality in question from multiple local perspectives. Consequently, the researcher has been doomed to have a passive role. This tendency did not deal adequately with the dangers of false consciousness. Therefore, a researcher has an obligation to seek an objective perspective ultimately on a global scale when acting as a catalyst in a developmentally-oriented research (Engeström 2000b; Miettinen 2004).

As already mentioned, the social scientist acts on two frames of meaning: one is the local social reality under study and the other is the global science society. The social scientist needs to move between two thought positions: "insider" and "outsider". In this study, being an insider means being both a teacher (a representative of the research object) and a researcher (a subject of the research) at the FNDC. On the other hand the other thought position, the global science society, has enabled the researcher to self-reflect on a "higher" level to the quality of his ethical decision making[44].

In other words this means that the social scientist should have *a priori* commitment to which side he is on: interpreting and influencing the global social reality in a responsible manner. The researcher has responsibilities on various kinds of levels. Hence, he has a multilevel social responsibility. On the "local level" he needs to contribute to the development of the communities and activities he is studying. On the "societal level" he also needs to produce *certified* scientific knowledge[45]. The knowledge production has to be controlled by the maintained epistemic and metaparadigmatic standards of the science and by actively collaborating in researcher programmes and collectives.

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[44] The researcher agrees with Thomas Donaldson and Thomas Dunfee (1994, 1999) that we all, not just scientists, should have some general shared principles governing our activities. For example local scientific communities may specify, as they often do, ethical norms for their members through "microsocial contracts" (they clarify authentic norms). But the crucial point is that in order to be obligatory, a microsocial contract *must be compatible* with hypernorms (e.g. ethos of science but also social transformation, equality, democracy, social justice).

[45] Certified knowledge ("savoir" in French) means knowledge that has been legitimized by some institutional mechanism (i.e. peer review) (Foray 2004, 6; cf. also Foucault 1972, 16). If then science is actually a global activity, scientific research has to be *internationally reviewable* and reviewed.

Because science is fundamentally an international activity and each researcher shares the responsibility for how science proceeds, the researcher is also responsible on the "global level". The main challenge for a social scientist acting continuously both on the local and global level is how to perform undistorted and balanced actions. Is he willing to struggle against the distortion caused by the inevitable prior commitments and influences of the various social perspectives (Hammersley 2000; Miettinen 2004) other than the holistic global one?

Traditionally, critical theory has been the other main alternative of anti-positivistic research, and action research is the main methodology of it. The knowledge constitutive interests proposed by Jurgen Habermas (1972) are briefly explained in footnote 43. The Habermasian interests also play a pivotal role in the background of action research. According to Stephen Kemmis (2001) much action research is of a technical form. It is essentially oriented towards functional improvement, measured in terms of its success in changing particular outcomes of practices. On the other hand, a good part of action research is best described as of a practical form. It has technical aspirations for development, but it also aims to guide the practical decisionmaking of practitioners (Schön 1983, 1987). However, unlike technical action researchers, practical action researchers aim just as much at understanding and developing themselves as the subjects of a practice as developing the outcomes of their practice. There seems to be a smaller body of action research which might be labeled critical or emansipatory. This form of action research aims not only at improving outcomes, and improving the self-understanding of practitioners, but also at assisting practitioners to arrive at a critique of their social and work settings. Emansipatory action research aims at helping practitioners to develop a critical and self-critical understanding of their situation and to transform these situations (Carr & Kemmis 1986; Kemmis & McTaggart 2000; Cohen et al. 2000; Kemmis, 2001).

Action research[46] is often distinguished from conventional research by three particular attributes:

– Shared ownership of research projects.
– Community-based analysis of social problems.
– An orientation toward community action. (Kemmis & McTaggart 2000, 568)

[46] It is akin to participatory action research, critical action reseach, classroom action science, action learning, action science, soft systems approaches, and industrial action research (Kemmis & McTaggart 2000). Action research is analyzed here because it seems to offer an appropriate alternative to be used in the empirical part of the study.

If the purpose of action research is to change practices, practitioners, practice settings and the situation in which the practice is conducted, how do action researchers conceptualize these issues? How do they make a difference between scientific research and normal work?

Kemmis and McTaggart (1988; cf. Cohen et al. 2000, 227-228) distinguish action research from the everyday actions of teachers as follows:

- It is *not* the usual thing teachers do when they think about their teaching. Action research is more systematic and collaborative in collecting evidence on which to base rigorous group reflection.
- It is *not* simply problem-solving. Action research involves problem-posing, not just problem-solving. It is motivated by a quest to improve and understand the world by changing it and learning how to improve it from the effects of the changes made.
- It is *not* research done on other people. Action research is research by particular people on their work, to help them improve what they do, including how they work with and for others.
- Action research is *not* "the scientific method" applied to teaching. There is not just one view of "the scientific method"; there are many. ..[Action research] adopts a view of social science which is distinct from a view based on natural sciences..Its view is distinct from the methods of the historical sciences because action research is concerned with changing situations, not just interpreting them.

If then an action researcher should act on two frames of meaning, how can he get the other frame of meaning – the outsider social scientific view? Or is it possible to just use the "best practices" of other educators when changing one's own educational practice? Why then do action researchers not often participate in the theoretical debate (Robson 1993, 439–442; Miettinen 2004)? Maybe the purpose to *change* has overridden the possibility for *development* and *progress*?

Even in the case of action research we cannot forget science and its morals. According to Carr and Kemmis (1986) the purpose of educational research is to ensure that the observations, interpretations and judgments of educational practitioners can become more coherent[47] and rational and thereby acquire a greater degree of *scientific* objectivity. As mentioned above, social scientific research is

[47] Paul Thagard (1992) has coined the theory of explanatory coherence to be able to explain conceptual change in science. He argues that examination of the recent history of psychology suggests that conceptual change in the natural sciences differs from that in social sciences. Using behaviourism and cognitivism as cases he explains that their adoption was more a result of other considerations (e.g. methodological) and estimates of future explanatory coherence (expected explanatory coherence) than actual explanatory coherence.

and should to be a *double hermeneutic process (*Giddens 1984, 1990, 2001; cf. also Habermas 1984) - an interaction between the meaningful social life of the practitioners and the social scientific worldview. In the process the need for change is balanced by the understanding of where we are heading in this development and why and how the development can be achieved. In the next chapter the pedagogical theories and practices of the FNDC will be put into interaction with educational reform studies, aiming to develop the current educational institutions.

Chapter Three
REFORMING EDUCATIONAL INSTITUTIONS

3.1. Emerged paradox of educational institutions

The main idea of this chapter is to introduce the topic of reforming educational institutions. Some prominent researchers[48] are identified and their main studies analyzed. Here the intent is not to summarize the content of their studies, but rather to condense the primary lessons and identify their main *dimensions*.

According to Peter Jarvis (1999) an educational institution is a place where education takes place[49]. This conceptualization allows us to see strong similarities between all kinds of schools, colleges and universities. This does not mean that there is some need to forget the obvious and essential differences of different educational institutions, but that we have to be aware of their similarities as well.

Among the chosen educational reform researchers *a paradox*[50] has emerged. Some insist that the educational reform has failed time and time again (Fullan & Hargreaves 1992; cf. Goodlad, Klein & Associates 1970; Fullan 1993; Miettinen 1994; Hirsch 1996; Bereiter 2002; Olson 2003), while others claim that educational institutions have been doing innovative reforms all the time. John Goodlad (1975) explains the paradox so that while schools (educational institutions) have been

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[48] The chosen researchers are representatives of the English-speaking world. Miettinen is a Finn but he has analyzed some of the studies of these researchers (especially Goodlad). When following the chosen cognitive trails the general tendency to globally refer to the research made by these prominent researchers needs to be recognized.

[49] Olson (2003) claims that few reform writers acknowledge that the school is an educational institution that *imposes* its criteria and norms on individuals. Olson's sociological position did not allow him to see how the institutionalized structure is always both constraining and enabling, being in a certain sense more "internal" than exterior to their activities in a Durkheimian sense. The structural properties of social systems are both the medium and outcome of the practices they recursively organize (Giddens 1984).

[50] The paradox could be labelled as the Innovative-Stability Paradox. Paradoxos in Greek combines two roots: *para*, which can mean variously beside, by, with, beyond, past, against, or contrary to; and *doxos*, which means "that which is generally thought or believed, "the common opinion". Interestingly a paradox is an argument in which you take sides – both sides. (Wilder & Collins 1994, 84-86) Often the paradox is interpreted as a dilemma (cf. this chapter) but the main unifying idea is the *dimension between two essential poles of interest.* Of course various kinds of interpretations have been done about dilemmas (cf. e.g. Billig, Condor, Edwards, Cane, Middleton & Radley 1988; Kärkkäinen 1995; Toiviainen 2003).

attacked for not changing, for being mired in the past, they have also been attacked for embracing the new uncritically, for grasping at every passing fad.

When seeking the claimed educational innovativeness it is useful to recognize that some innovations, once deliberate educational reforms, have become so pervasive that they were no longer seen as reforms and thus disappeared from the scoreboard of successful changes[51]. Following the thinking of David Tyack and Larry Cuban (1995), it is easy to recognize how filled with several kinds of innovations an educational institution is, considering things like blackboards and overhead projectors et cetera. Presently they may seem trivial, hardly worth of the label of innovations, yet not long ago they were high on the agenda of necessary innovations and reforms. Interestingly the educational innovations seem to be mainly product innovations but *seldom process innovations* (cf. Stoneman 1995). For educational institutions process innovations could mean for example new kinds of teaching and learning processes.

On the other hand, we should remember that if viewed over a period of roughly 500 years, the striking impression is of how little educational institutions have changed (Olson 2003). The overwhelming stability of the educational institutions is obvious, particularly when remembering the ways how educational institutions divide time and space, classify students and allocate them to classrooms or auditoriums taught by individual teachers, splinter knowledge into "subjects", and award grades and "credits" as evidence of learning (Goodlad, Klein & Associates 1970; Tyack & Cuban 1995; Engeström, Engeström & Suntio 2002). Hence, it seems that our means to overcome the mentioned generalized and stabilized constraints and built-in obstacles to deep educational reforms have not been as effective as it has often been expected.

3.2. How to solve the paradox?

How then to solve the paradox between the stability and the fluidity of educational institutions? For a start we need to recognize that we often tend to refer to different dimensions of change in depth, breadth, level, and time (Cuban 1999). The *depth* of change indicates the degree to which the designers of a particular innovation seek to make minor ("surface", "incremental"), modest, or major ("deep", "fundamental",

[51] Change is actually not synonymous with progress (Tyack & Cuban 1995) or development, although in the present field the difference is often not so obvious.

"radical", "transformational" [52]) changes or transformations in the essential features of the educational institution (Fullan 1993; Cuban 1999).

Educational reforms, as other reforms, tend to slide towards quick-fixes and faddisms (Fullan & Hargreaves 1992; cf. Miclethwait & Wooldridge 1996) on a surface level. These reforms are often said to be "transformational" or "fundamental", although in reality they are minor changes "above" the sound basic structure of the educational institution in question. Often some "magical Phoenix" has been said to arise from the "ashes" of the current educational institutions, but actually no educational "Phoenix" is possible and the educational institutions are not in ashes. Despite of these facts, quick-fixes are often favored, supported by unrealistic time lines, by unawareness of the essence of the educational institution, and unwillingness to face the social reality (Fullan & Hargreaves 1992; Fullan 1993; Tyack & Cuban 1995; Cuban 1999, 2004[53]). Michael Fullan (1993) explains this tendency by emphasizing that we often tend to forget that problems are *complex*, dealing with them by strategies making no fundamental and systematic difference.

One example of a quick fix and surface level educational reform is *the adding tendency*. It means symbolic curricular and pedagogical changes by adding some new courses in a curriculum without affecting the underlying basic assumptions, values and ways of practicing (Fullan 1993; Hirsch 1996; Cuban 1999; Bereiter 2002).

Educational reforms are intrinsically political[54] in origin; also in the politically controlled armed forces. For illustrative purposes *the reform process* can be divided into three stages: reform talks, adoption of reform and the actual implementation (Tyack & Cuban 1995). Different kinds of groups organize and contest with other groups in the politics of education to express their values, perspectives, suggestions and imperatives for educational development. Hence, a continuous *policy and reform talk* surrounds the educational institutions. In the next stage a made reform *decision is adopted* by obeying officials and teachers. Finally, *the actual implementation* of the planned change follows in the educational institution, but is often much slower and more complex than the first two stages. Separating these stages in

[52] When comparing the views of Carl Bereiter (2002) and Larry Cuban (1999) it is essential to notice that for Bereiter reform is not the "deepest" form of educational development but for Cuban it is. Hence, we need to be aware how an individual researcher conceptualizes the phenomenon and how he uses the concept.

[53] An appropriate period for the evaluation of a educational reform seems to be somewhere between over 5 years and a generation or even more (Miettinen 1994; Tyack & Cuban 1995; Cuban 1999).

[54] Despite of this, the contribution of the political science has been minimal to the field of educational reform research. Hence, for example power seems to be a underanalyzed issue.

analysis helps in specifying just what is changing in what way and what remains relatively constant.

Educational reforms tend to offer battle grounds for contradictive perspectives and values. Two main contradictive perspectives can be identified: *an administrative* and an *instructional perspective* (Bereiter 2002[55]). Since the 1910s and 1920s administrative progressives have been applying the principles of Frederick Taylor's "scientific management" for the educational reforms in the United States and elsewhere (Cremin 1961; Callahan 1962; Miettinen 1994; Cuban 2004), neglecting the social reality of the teachers and consequently the instructional perspective[56]. Hence, the quality of teaching and learning is often left untouched, causing a chain of ineffective educational reforms and sustained stability of the educational institutions.

Tyack and Cuban (1995) highlight some contradictive issues in teachers' social reality:

– Students need to be socialized, yet taught to be critical thinkers.
– Academic knowledge produced by previous generations needs to be taught, yet also marketable and practical skills need to be learned.
– Students need to be cultivated to cooperate, yet each student competes with the others in the educational institution and later in life.
– Students need to learn basics but also creativity and higher-order thinking needs to be encouraged.[57]

The dilemma language could be justifiably extended to include also the dualities below:

– Reform done in "top-down" or "bottom-up" manner.
– Centralized or decentralized governance of reforms.
– Excluding or including teachers to the planning of the reform.
– Narrow or multiple purposes of the schooling.
– Local or global cooperation.

Historically accumulated contradictions are intrinsic to human activity and also to schooling (Engeström 1987; Cuban 1999), but what

[55] Cuban (2004) makes a distinction between "administrative progressives" and "pedagogical progressives".
[56] This means that the worlds of the administrators and the teachers may differ a lot. Tyack and Cuban (1995) explain how the worlds of technocrats (administrators) and teachers have been mainly miles apart during the analyzed past century.
[57] This list offers some examples of contradictive features in educational institutions, but e.g. Berlak and Berlak (1981) have developed a dilemma language containing sixteen dilemmas (sets of "control", "curriculum" and "societal") to be explored in the educational institution.

kind of a role do they play for the educational institution? According to Cuban (1999), the university-colleges have been places where contradictions have produced an enduring stability in beliefs, structures, and cultures. On the other hand Engeström (1987) has been arguing that new qualitative stages and forms of activity emerge as solutions to the contradictions of the preceding stage of form. But how then to explain the immanent stability of the educational institutions facing several contradictions on a daily basis? Why have the educational institutions been living in an state of everlasting stability? Why have new qualitative stages and forms of activity not emerged as solutions for educational institutions? Could this state of affairs be explained by the lack of deliberate efforts of teachers?

The proper question for the teachers confronting the above contradictive issues on a daily basis is not which one of the alternatives to choose, because both offer points of departure for dialectical synthesis. Often teachers tend to be unaware of these dilemmas and contradictions, but they could be identified as a part of a necessary but not sufficient prerequisite for deep transformational educational reform during *teacher education* (cf. Fullan & Hargreaves 1992; Fullan 1993; Tyack & Cuban 1995; Hirsch 1996; Cuban 1999; Bereiter 2002).

The next dimension of change or development needs to be remembered in this phase – *the breadth*. The breadth of change means the continuum between unsystematic ("narrow") and systematic ("broad") reforms (cf. Cuban, 1999). In this study unsystematic breadth means emphasis on for example teaching methods (e.g. distance learning), teacher education, or even shared values, norms and codes of conduct. This does not mean, however, that we should forget these issues but that we cannot deal with them unsystematically.

Rather than starting from a scratch in reinventing educational institutions, it makes most sense to graft thoughtful reforms onto what is healthy in the present *system*. When identifying unhealthy features or problems in the present practices, the expertise and knowledge of the teachers should not be excluded, at least if the main purpose is to develop the teaching and learning (Tyack & Cuban 1995) at the educational institution.

As Fullan and Hargreaves (1992) emphasize, teachers are a big part of the educational institution, and as individuals and groups of individuals, they must take responsibility for improving the *whole educational institution*. If they do not, their individual classrooms will not improve either, because *forces* outside the classroom heavily influence the quality of classroom life. But was is meant by the whole

educational institution and the system[58]? What has been the *unit of analysis* in the educational reform studies?

According to Cuban (1999) the whole educational institution is not just a bunch of individual teachers, students and administrators. He reminds that the university (educational institution) is a decentralized organization of nested, quasi-hierarchical *layers* of authority and decision making interspersed with many semiautonomous units. For Cuban these levels or layers are the "bottom" (e.g. lecture halls, laboratories and seminar rooms), department, faculty and the institutional level. Thus, in a deeply transformational educational reform actions and activities on all levels are needed but how to do it and how do these levels interact within themselves? Do we need other layers than those proposed by Cuban?

The cultural core of the "bottom" layer is often left unchallenged, and consequently possibilities to fundamental reform are turned into impossibilities. The cultural "hard" core is also multilayered and reformers often tend to be unaware of the core, namely basic assumptions. If some kind of reform may take place, it often tends to be accretions around the core (Cuban 1993; Tyack & Cuban 1995).

On the other hand a fundamental type of reform (transformational) aims to alter the core beliefs, behaviors, roles, and structures of the educational institution drastically. In these kinds of reforms it is often recognized that less fanfare and display may be a more effective stance for an effective and fundamental reform. The fundamental type of reform represents systematic alterations in the ways teachers understand the meaning of knowledge, teaching, learning and how they see the learner (e.g. a passive receiver or an active actor[59]).

It is often thought that an educational reform can be generated by a general formula (Olson 2003) and consequently, local conditions and contexts have received only minor attention. The reality of the teachers needs to be faced; the busy, contradictive and complicated "bottom" level where teaching takes place needs to be kept in mind. As mentioned above, some of these features are virtually the same for all teachers, but some aspects vary. Students, curriculums, material

[58] In his responsive model of educational improvement Goodlad (1975, 1984) claims that the optimal unit for educational change is a single school where pieces of the whole, the commonplaces of schooling (teaching practices, content or subject matter, instructional materials, physical environment, activities, human resources, evaluation, time, organization, communications, decision making, leadership, expectations, issues and problems, and controls or restraints), constitute something close to the whole of the school. Goodlad's unit of analysis seems to be an ambiguous and eclectic list. Cf. Miettinen (1994).

[59] Here it is crucial to remember the difference between espoused and "authentic" basic assumptions (cf. Argyris & Schön 1978). Espoused assumptions are often said in unreflected manner but the road towards "authentic" assumptions goes along self-reflection and social evaluations.

facilities, cultures[60] and other organizational features vary in different educational contexts a lot. Hence, teachers need to use different approaches to teaching and classroom management in different kinds of times and places.

Instead of being ready-made plans, reform policies could be stated as principles, ideas, beliefs, general aims[61], to be modified in the light of experience (Tyack & Cuban 1995) and partly in the light of pedagogical research. These features seldom determine specific behaviors, but they do offer direction, heuristic support and justification for actions taken (Cuban 2004; Hakkarainen, Palonen, Paavola & Lehtinen 2004).

Based on the present analysis, some primary lessons and guiding principles have been condensed to the following list:

- Making fundamental changes (e.g. in basic assumptions, values, cultures) in long-lived institutions is a rare but a real possibility.
- The ahistorical nature of most current reform arguments results in both a magnification of present defects in relation to the past and an understatement of the difficulty of changing the system.
- A deep understanding of the structures, processes and cultures of the educational institution in question and of the larger socioeconomic and political arena in which it exists should and could be achieved systematically.
- Paradoxically, there seems to be a lack of collegiality and individuality in the development of teachers. These features are not incompatible; they can and must go together if we are to improve our educational institutions fundamentally.
- Our "sociological beliefs" influence how we see our educational institutions (as "bureaucratic factories" or "organic entities"), the relationship between them and the society, and ultimately the role of our teachers interacting with these social structures (cf. e.g. the Durkheimian view of Olson 2003 (cf. Collins 1994), and the Giddesian view of e.g. Fullan & Hargreaves 1992).
- Present problems are caused by historically accumulated contradictions, and the reformers should be aware of these (Engeström 1987; Cuban 1999).
- A continuous and life-long teacher education is a necessary but not sufficient prerequisite for a deeply transformational educational reform. Teachers could be seen as change agents of the educational reform and they should have a clear moral purpose.

[60] According to Schein (1992) the levels at which culture can be analyzed are basic underlying assumptions, espoused values and artifacts.

[61] Often the unreflected internal coherence of the logic of reform enables defective logics to stay (Cuban 2004). Traditionally similarities have been emphasized and hence similar principles have been put into practice in all kinds of organizations. Contrary to this tendency we should be better aware of the differences between for example schools and businesses.

– A strong commitment and strong will are required in the process because fundamental reforms are made incrementally.
– Not just the means but also the ends should be reflected. There is a strong need for a guiding long-term purpose (Tyack & Cuban 1995; Cuban 1999), for a shared vision (Fullan 1993) and for guiding ideas. The reform of the educational institution is also a prime arena for debating about the shape of the future of the society, and schooling is something more than an instrument of international economic competitiveness (Cuban 2004).
– If then the educational reform is tried to be guided by ideas and theories *cross-appropriated* from high technology firms (Hargreaves 1999) or from management "gurus" (Fullan 1993) should we analyze these carefully before applying them to our educational institutions? If we should abandon and replace these misleading ideas (Fullan 1993; Hirsch 1996), by what kinds of theories could this be done? Or is this just a matter of practitioners needing to exchange "best-practices" with each other in our "post-modern" social reality? Can we reduce this problem to a matter of following simple rules without confronting the complexities, paradoxes and contradictions of our current social reality?

In the next chapter the field of organizational learning and knowledge creation activities is discussed to analyze the chosen currently cross-appropriated educationally oriented theories more deeply, aiming at deciding to what an extent we could *falsify* them while aiming towards the "truth" and synthesizing a justifiable framework for educational institutions.

Chapter Four
RESEARCH PROGRAMMES OF THE STUDY

4.1. The FDF as a learning organization: key principles for reformers of military educational institutions

According to the newest strategic decisions, the FDF's operating culture is developed according to the "learning organization" principles (Finnish Security and Defence Policy 2004; cf. Personnel Strategy 2005). Hence, the emphasized principles of learning organizations need to be analyzed before focusing more holistically on the main principles and frameworks proposed in the studies of organizational learning and knowledge management.

In the FDF Peter Senge's (1990) principles for learning organizations have been recognized and a process to put them into practice has been started. Also in Finland these original principles have been cross-appropriated by some Finnish researchers (cf. i.e. Sarala & Sarala 1996; Moilanen 2001) but here these researchers (i.e. filters) have been passed and the analysis begins straight from the text of Peter Senge (1990).

Senge's main principles (1990, 6–10) are systems thinking, building a shared vision, centrality of mental models, personal mastery, and team learning. Firstly, according to Senge,

> *Systems thinking* is the fifth discipline that integrates the disciplines, fusing them into a coherent body of theory and practice.[62]

To Senge systems thinking is more or less a powerful language, augmenting and changing the ordinary ways we think and talk about complex issues (Senge, Kleiner, Roberts, Ross & Smith, 1994). This shift of thinking is aimed towards a common understanding of a system. So it is not enough to say that we have a system but we have to understand what kind of system we actually have, and this view should be organizationally widely shared.

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[62] The roots of Senge's systems thinking lie for example in cybernetics, in chaos theories and in gestalt therapy. All these approaches have one guiding idea in common: that the behaviour of all systems follows certain common principles. For further reading see Ståhle (1998).

Some people think that the systemic structure of an organization is the organization chart. Others think that systemic structure means the organizational work flow and process figures. But in systems thinking, the systemic structure is the pattern of interrelationships among the key concepts of the system. It might include the hierarchy and process flows, but it also includes attitudes and perceptions, the quality of products, the ways in which decisions are made, and hundreds of other factors. Often these systemic structures are invisible, but sometimes also visible. Following this kind of systemic thinking, our understanding of the process of organizational change has to be re-evaluated. The process is not top-down or bottom-up but participative at all levels (Senge et al. 1994). Senge's systemic thinking may challenge our habitual ways of thinking but it has also been argued that he does not offer any clear systematic structure but mainly some general conceptual tools (Engeström 1999a, 377) and metaphors (Kim 1993)[63].

Secondly, as has already been mentioned, learning organizations create desired results. One of these desired results is their own future (Senge 1990) but also they themselves as individuals and organizations. To achieve this, a learning organizations needs *a shared vision*. Commonly a vision is understood to be an image of the desired future. Senge explains that building a shared vision is actually only one piece of a larger activity: developing the "governing ideas" for the enterprise, its vision, purpose or mission, core values (Senge 1990, 223-224) and even goals (Senge et al. 1994). The main thing is not what the vision is but how the vision is formed and what the vision does. In other words, the only meaningful criteria for judging the vision are the actions and changes that ensue (Senge 1990; Senge, Scharmer, Jaworski & Flowers 2005); if they do ensue.

Thirdly, for learning organizations problems are not just out there but right here inside the organization and its individuals. For organizations this means that they learn through individuals who learn, although individual learning does not guarantee organizational learning. But without it no organizational learning occurs (Senge 1990, 139). How to conceptually clarify what is meant by learning? According to Senge learning always involves new understandings and new behaviours, "thinking" and "doing" (Senge et al. 1994). Although Senge's theories of the learning organization involve *a change in mental models* or *a shift of mind* (Senge 1990, 13) not only the thinking mind but also the whole acting individual human being is needed for successful development (cf. Nonaka & Takeuchi 1995, 239).

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[63] Cf. e.g. Senge, Cambron-McCabe, Lucas, Smith, Dutton & Kleiner (2000) for counterargumentative examples.

Fourthly, the learning organization needs individuals who learn and who have *personal mastery* of their lives. The mastery does not mean only adaptation to the situation at hand and foreseeing the future but also capabilities to clarify what is desired and how the desired end state can be achieved. Shared organizational visions should emerge from personal visions, desires and deepest aspirations made by intuitive individuals.

Fifthly, although originally Senge emphasized the importance of team learning, later his emphasis shifted from team learning to more organizational learning (Ståhle 1998, 251; cf. Senge, Cambron-McCabe, Lucas, Smith, Dutton & Kleiner 2000; Senge et al. 2005). According to Senge and his associates (2000) in all kinds of schools (i.e. in all kinds of educational institutions) there are three nested systems at play – the classroom, the school, and the community. All these are interdependent with each other, and all are interwoven patterns of influence.

As already mentioned, the FDF states its intent to develop its operating culture on "learning organization" principles. After briefly analyzing the main principles of Sengean learning organization we need to focus on the issue of how these principles have been adapted and maybe modified in the FDF.

According to the newest competence development strategy of the FNDC[64], common for the definitions made on the learning organization are understanding the importance of learning in all efforts to change and develop the organization. In the concept of learning the following aspects have been emphasized:

- Individual experiences and those acquired in group are valued as a basis for learning.
- The significance of social interaction, for instance discussions, various opinions, joint planning and evaluation of activity is emphasized.
- As a prerequisite for high quality learning, the emphasis is on individual, group based and local self-directing properties and activity based on critical thinking.

It is obvious that the concept of learning described above has been influenced by David Kolb's experiential learning method (the emphasis on "experience"; Kolb 1984; cf. Nissinen 2001; Levomaa & Rokka, 2004[65]). The emphasis is on social interaction, meaning that

[64] Competence development strategy; i.e. the Competence Development of Salaried Personnel in the Finnish Defence Forces (2004).

[65] According to the Chief of the Training Division of the FDF (Nordberg 2004, 158) the conception of learning is constructivist (cf. also Nissinen 2001; Kallioinen 2001; Kalliomaa 2003). The "tool box" called constructivism will be discussed in Chapter 8. Cf. also chapter 2 where some views of Ernst von Glasersfeld (the founding father of radical constructivism) were introduced.

implementation of the strategy of competence development requires continuous discussions about *the objectives* of the activities and *the values* that direct it on the practical level (Competence Strategy 2004, 4). As a main tool for these discussions the superiors and their subordinates in the FDF have annual planning discussions.

The concept of learning is said to depend on how a human being and knowledge are understood. In brief, a human being is seen to be conscious, active and responsible; a person who is valuable as such. Knowledge is said to be created by individual and joint action, which is both practical and scientific (Competence Development Strategy 2004, 8). Having said this, a military pedagogical perspective needs to be highlighted, translated to be defined as:

> A doctrine of training skills. It is a doctrine of setting goals, guiding learning and assessing training activities and know-how (Nissinen 2001, 138; cf. Toiskallio 1998a, 9).

In this phase a paradox is caused in the translation process because actually Toiskallio does not mean that we should forget know-that type of knowledge. But what is the relationship between competence and knowledge; between know-how and know-that elsewhere than in the FDF? This issue is discussed in this chapter and later in chapter 8.

Not just learning but high quality learning and centrality of the learning culture have been emphasized in the competence development strategy. The culture refers to the basic ways of acting and doing (Toiskallio 1996, 3) and to hidden beliefs, views and routines (Toiskallio ed. 2000, 61) widely shared in the organization. When analyzing culture, the levels of organizational culture explained by Edgar Schein (**figure 4.1**) need to be remembered (cf. Halonen in Toiskallio, Royl, Heinonen & Halonen, 2002).

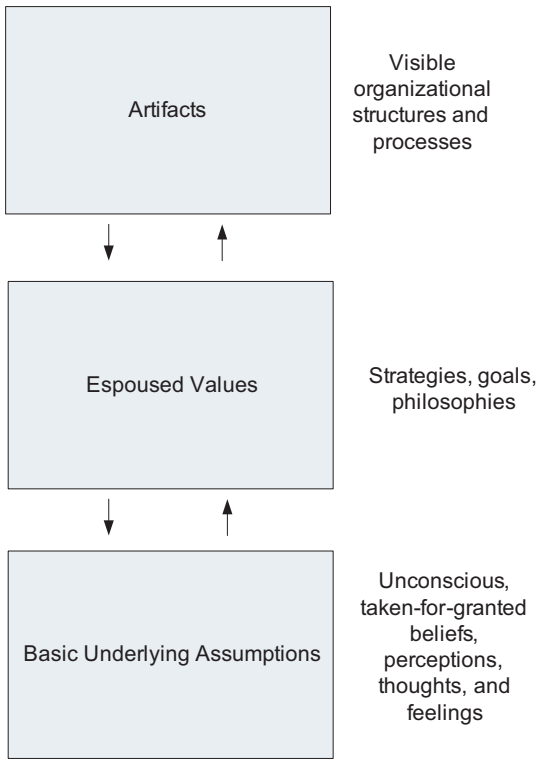

Figure 4.1 The levels of culture by Edgar Schein
Source: Schein 1992, 17.

According to Toiskallio (2003a, 115), planning the education and training means an attempt to make the future. Implicitly this means that the culture is changing, but how and to what direction should it be developed and transformed? Based on Burns (1978) and Bass (e.g. 1998) Nissinen (2001) explains that the development of the culture is possible only through transformational leadership. The renewed leadership training of the FDF[66] aims to change the leadership culture of the FDF so that in the future *actual* value discussions would be possible, followed by conclusions and acts of development. In fact this means that each and everyone serving in the FDF is partly responsible for his or her personal development and hence for the future of the FDF's operating culture.

Not just values, but also more fundamental basic assumptions need to be focused on. The competence development strategy clearly states that a human being is seen to be a conscious and active one. Is it then impossible to identify any "passivity" from the personnel of the FNDC and what are the consequences if we neglect the possible passivity?

[66] The Deep Leadership Model (Nissinen 2001).

Obviously the conception of a human being and other main features of the basic assumptions need to be *researched*. Consequently, the individual learning processes are going to be influenced by the produced research results.

The competence development strategy explains that when the FDF will be developed into a learning organization, *the system* must be examined as a whole and as relations of interaction between its different elements (Competence Strategy 2004, 9). This statement raises more questions than answers: what is meant by the system? What is the unit of analysis when developing the organizations of the FDF to operate according to the principles of the learning organization[67]?

4.2. The first generation knowledge management theories producing ideas for reformers

Serving in the FDF, it was natural to begin the analysis from the works of Senge and his disciples, but because of the emerged need to know other research "paradigms" in the knowledge society, a widening of the scope was needed. Also other main research programmes in the field of organizational learning and knowledge management[68] needed to be included in the analysis.

With these future oriented research programmes the researcher started to scan our social reality, recognizing a strong claim: knowledge claimed to be *the* resource (Drucker 1993, 42, 45) and obviously something to be learned at the educational institutions, but what was meant by "knowledge"? Maybe the theories of knowledge management could offer some assistance for these kinds of inquiries.

Why is it relevant to look at knowledge management theories when trying to develop an educational institution? First, as explained in chapter 3, knowledge management theories have presently been cross-appropriated to be used as tools in educational reforms (e.g. Fullan 1993; Hargreaves 1999) but on the other hand "flawed" guiding ideas have been demanded to be replaced (Fullan 1993; Hirsch 1996); but before doing this it is justifiable to analyze what the essence of these cross-appropriated theories is and what they should be replaced with.

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[67] In order to show the direction for further studies on the learning organization, three main research programmes play a pivotal role in the field: Argyris & Schön (1978, 1996); Pedler, Burgoyne & Boydell (1989). During the 1990s; Senge, 1990; Senge, Kleiner, Roberts, Ross & Smith (1994). Cf. also Garvin (1993).

[68] The concept of knowledge management is "a tool box" including e.g. knowledge creation (Nonaka) and knowledge building (Bereiter) as its tools.

Second, based on this extended set of first generation of knowledge management theories it is possible to have a wider view when locating educational institutions as pivotal parts of national and supranational innovation systems (Kline & Rosenberg 1986; Stoneman 1995; Freeman & Soete 1997; Lundvall, Johnson, Andersen & Dalum 2002; cf. Miettinen 2002; Joint vision 2020 2000).

The concept of innovation is often used rather ambiguously and paradoxically, depending on whether one has a wider or a narrower definition of it. When the wider concept has been used, the Schumpeterian trilogy (Stoneman 1995; Schumpeter 1934: 1983) has often been referred to. In the trilogy, invention (the inventor), innovation (when the "new" idea is put into practical use), and diffusion have been differentiated. A paradox emerges due to the fact that on the other hand the word innovation refers to the whole process (cf. Freeman & Soete 1997) but it is often mixed with inventions and creativity. For the purposes of the present study, innovation refers to the entire process of the trilogy without mixing it with inventions and creativity.

Although the Schumpeterian trilogy offers some clarity conceptually, it is essential to remember that since the 1970s the linear model of innovations has been challenged by "chain-linked models" emphasizing feedback loops, complexity and uncertainty of innovations (Kline & Rosenberg 1986; Tuomi 2002).

A way out of this ambiguous innovativeness lies in the clarification made by Nonaka and Takeuchi (1995, 6): knowledge creation (and alternatively or additionally organizational learning processes) fuels innovation. Therefore, it is logical to start the analysis from the essence of knowledge "management". This allows us to make sense of what happens inside the black box called "innovation" (cf. Miettinen, Lehenkari, Hasu & Hyvönen 1999; Tuomi 2002).

When analyzing the roots of the knowledge management movement historically it needs to be noticed that it has emerged from information management (cf. e.g. Nonaka 1991b; Nonaka, Umemoto & Senoo 1996). Ever since, the difference between the concepts of information and knowledge has stayed unclear. This issue will be discussed later when analyzing Nonaka's theories.

Actually all the branches, generations and movements of knowledge management and organizational learning can be seen as sensemaking tools. Therefore it is essential to focus also on theories of sensemaking when discussing the theories of this field (e.g. Weick 1995, 2001; Weick & Sutcliffe 2001; Choo 1998).

We live in a society often called information or knowledge society where information or knowledge is claimed to be *the* resource. Based on Peter Drucker, many researchers and practitioners have emphasized that knowledge is *the* resource, and traditional factors of production – land and other natural resources, labor, and capital – are secondary ones (Drucker 1993, 42, 45; Nonaka & Takeuchi 1995, 6; Davenport & Prusak 1998, 2–13; Choo 1998, 2; cf. Neef, Siesfeld & Cefola 1998; Foray 2004).

There is a difference between information and knowledge, but what kind of difference? A hierarchy of data-information-knowledge has usually been identified (Allee 1997, 16; Davenport & Prusak 1998, 2; Tuomi 1999, 237[69]), although the main emphasis has commonly been on the difference between information and knowledge (Nonaka & Takeuchi 1995, 57-59; Sveiby 1997, 24; Choo 1998, 2). According to this hierarchy, knowledge is more than information, although all lower level features are obviously needed as a "raw material". The researchers, excluding Nonaka, do not explain the different aspects of information (i.e. syntactic and semantic aspects), which are a pivotal issue when trying to understand the essence of communication.

Von Krogh and Roos (1995) remind us that knowledge, as well as the mind, the world, intellect, are highly experience-distant concepts (cf. Geertz 1973). Hence, these concepts usually do not invite an understanding of everyday life. For the first generation knowledge management researchers this danger seemed to be a real one due to the weak interdisciplinarity with the major social science disciplines (e.g. sociology (cf. Gherardi & Nicolini 2001[70]), but also other social sciences (cf. Dierkes, Antal, Child & Nonaka eds. 2001)) and scarcity of double-hermeneutic processes with practitioners. In the present study, avoiding these kinds of dangers has meant crossing the boundaries between various disciplines, between social sciences and natural sciences while aiming at an "experience-close" double-hermeneutic process at the FNDC.

Presently we live in a profit-driven economic world, as can be seen at first sight in the first generation management theories (cf. Nonaka & Takeuchi 1995; Leonard 1995; Sveiby 1997; Stewart 1997; Davenport & Prusak 1998). In these theories the economic system seems to be a machine where the profit motive and economic growth is the mother of all ends, but this is not the whole "truth" in this case. For the

[69] Cf. Tuomi (2000) for an alternative hierarchy.

[70] They more or less explain the possibilities of sociology to make specific contributions to the study of organizational learning. Their analysis shows how underutilized these possibilities were among the first generation knowledge management researchers. The analysis made in this research underlines the conclusion. The sociological theories of Luhmann offer an example of the exception to the rule (cf. von Krogh & Roos 1995) as well as Giddensian interpretations of Nonaka (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004).

researchers of the first generation the economic machine seems to be partly driven by other than profit motives (e.g. sustainability; good life) as emphasized for example by Friedrich Hayek (1899–1992):

> The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate "given" resources..It is rather a problem of how to secure the best use of resources known to any of the members of society, for *ends* whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality. (Hayek 1945, 519–520, italics added; cf. Nonaka & Takeuchi 1995, 33)

According to these researchers knowledge is produced by individuals and it resides in them and especially in the minds of knowers (Nonaka & Takeuchi 1995, 126; Leonard 1995, 13; Davenport & Prusak 1998, 5; Choo 1998, 3). Although the knowledge creation process starts at the individual level it moves up to the higher "ontological" levels (Nonaka & Takeuchi 1995, 72–73; Leonard 1995, 118; Sveiby 1997, 23; Stewart 1997, 163; Choo 1998, 10–11; Davenport & Prusak 1998, 19–24) all the way to the knowledge ecologies (Davenport & Prusak 1998; Nonaka & Konno 1998)[71].

Despite the other motives, the economic machine needs knowledge as its main input. Hence, knowledge seems to be needed to be wrapped (codified) in measured boxes (Stewart 1997; Sveiby 1997; Edvinsson & Malone 1997; Davenport & Prusak 1998; Choo 1998, 264–266) and knowledge as a product is widely emphasized. But what to do with the residue; with tacit knowledge (Polanyi 1966; Nonaka & Takeuchi 1995; Ahonen, Engeström & Engeström 2000; Hansen, Nohria & Tierney 1999)? Consequently, being partly unknown even to the individual in question, knowledge seems to be largely unidentifiable and unmeasurable as a whole (e.g. Foray 2004, 9–12). Despite this unmeasurableness, the holistic nature of knowledge needs to be kept in sight.

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[71] Ahonen, Engeström and Virkkunen (2000) have criticized that the researchers of the first generation of knowledge management theories have used just the knowledge-carrying individual as the unit of analysis for mapping and enhancing knowledge. On the basis of the analysis mentioned above this criticism cannot be agreed upon. Cf. also Paavola, Lipponen, and Hakkarainen (2002); Hakkarainen, Palonen, Paavola, Lehtinen (2004), stating how Engeström's, (1987), Bereiter's (2002), and Nonaka's (with Takeuchi 1995) models focus on knowledge advancement at a communal level.

But have the researchers of the first generation knowledge management kept this holistic nature in their sight? Not necessarily. According to Allee (1997; cf. Ahonen, Engeström & Virkkunen 2000) we cannot solve our knowledge era questions with design approaches that came out of information age thinking (cf. von Krogh & Roos 1995). The current practices of "knowledge mapping" are cumbersome at best. In worst situations, people spend much time and resources in futile exercises. Unknowingly Allee described the present situation at the FDF.

Hansen, Nohria and Tierney (1999; cf. Tuomi 1999, 389–390; Foray 2004, 217–221) propose that there are two generic knowledge management strategies: codification and personalization strategy[72]. When choosing the codification strategy one codifies and stores knowledge in databases to be reused in the future. On the other hand, the personalization strategy means focusing on the dialogue and interaction between individuals instead of knowledge objects in the database. In the codification strategy the product nature of knowledge is emphasized, but in the personalization strategy perspective the processual view of knowledge gets more attention. But do we really have any alternatives other than the personalization strategy especially in our educational institutions?

Rather than being a codified product, knowledge has been seen as a process among the researchers of the first generation of knowledge management. For example Nonaka and Takeuchi have emphasized that to them knowledge is a dynamic human *process* of justifying personal belief towards the "truth" (Nonaka & Takeuchi 1995, 58). Referring to Varela, Thompson, and Rosch (1991), von Krogh and Roos (1995, 61) present this same point differently, claiming that a great leverage of knowledge is to be found in the *interface* between mind, society, and culture rather than in one or even in all of them. Knowledge is enacted in particular situations in a dynamic manner[73], driven also by other kinds of motives than a mere profit motive.

But how then do these dynamic processes emerge among individuals and how to solve the problem of utilization? Actually a communication problem emerges in the field of knowledge management studies, mostly unconnected to the field of

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[72] Tuomi (1999, 389-390) synthesizes a third alternative: knowledge creation strategy where the measurement system could include components that diagnose factors of organizational culture that are critical for knowledge creation, dynamics of its ba's, or social interactions that facilitate innovation.

[73] This statement challenges our widely shared assumptions of the unquestionability of bureaucracies where the interaction happens linearly in a stepwise manner between the different hierarchic layers of the organization.

communication studies[74]. But what to do if individuals hesitate to interact and if there is communicational malfunction partly influenced by the local "system" or the local culture?

We seem to need a systemic shift of mind but how to describe the system? Even Allee (1997)[75] does not describe what a system means to her, although she favors the Sengean (1990) shift of mind. One way to conceptualize the needed systemness is focusing on cultures (cf. Nonaka & Takeuchi 1995; Choo 1998). Nonaka and Takeuchi explain (1995) that studies of organizational culture have underscored the importance of such human factors as values, meanings, commitments, symbols, and beliefs, paving the way for more elaborate research on the tacit aspect of knowledge. On the other hand Nonaka and Takeuchi (1995, 42) identify some shortcomings in the Scheinian line of research. The organization and its individuals are portrayed as rather passive, neglecting the potential to change and to create something new. Interestingly the first generation knowledge management researchers have not explicitly uncovered the levels of culture[76] (cf. Schein 1992; Nissinen 2001, 216; cf. **figure 4.1**). **Figure 4.1** shows in an explicit form the underlying cultural aspects to be reconsidered when the aim is to enable shifts of minds. But how to make this kind of shifts; can we personally do something to make the shift happen?

There is a paradoxical situation between the theories of learning organizations and knowledge management (especially knowledge creation). There exists a link between learning and knowledge (Leonard 1995, 3; Choo 1998, 273; Davenport & Prusak 1998, 156; Nonaka & Takeuchi 1995, 63) but these concepts are not combined as an aligned system in the first generation of knowledge management theories. It will be analyzed below how possible it is to exclude learning from the practices and routines of different kinds of knowledge activities.

4.3. Knowledge creation theories by Ikujiro Nonaka

The theories of Ikujiro Nonaka have been seen as an interesting attempt (Engeström 1999a) to not just instruct but also explain how

[74] The exceptional analysis of von Krogh and Roos (1995) confirms the rule but do not connect the analysis adequately to the field of communication studies. Another exception is Aula (1999) who has, partly based on Nonaka's theories, coined a double function of communication (dissipative and integrative functions), challenging the traditional unidirectional Shannonian communication model.

[75] Later in e.g. Allee (2003) she has developed her value network view to explain how she sees systems and their relations.

[76] The term "level" refers to the degree to which the cultural phenomenon is visible to the observer (Schein 1992).

to manage in the fierce competition of the Knowledge Age (Bereiter 2002). They have been seen also as an interesting suggestion for schools (Hargreaves 1999) and maybe even to the educational institutions.

Nonaka was the world's first holder of a professorship dedicated to the study of knowledge. The professorship (the Xerox Distinguished Professorship in Knowledge) was created in 1997 to the Haas School of Business at the University of California, Berkeley. Nonaka draws a clear distinction between knowledge management and knowledge creation, as illustrated by the following episode. In naming the first chaired professorship dedicated to the study of knowledge and its impact on business the Haas School of Business initially recommended the title "Xerox Distinguished Professorship of Knowledge Management". Nonaka inquired if the title could be changed to "Xerox Distinguished Professorship of Knowledge Creation" due to the fact that the Japanese approach to knowledge differs from the Western approach in a number of ways. As a compromise, they agreed to call it "Xerox Professorhip in Knowledge". (Takeuchi 1998; Umemoto 2002[77])

One key reason for his appointment was obviously the research done by Nonaka during the 1980s and 1990s and his influential articles in Harvard Business Review (1991a), and in Organization Science (1994), but especially his highly valued book *The Knowledge Creating Company* published in collaboration with Hirotaka Takeuchi in 1995. In 1997 *the Economist* (May 31) dubbed Nonaka "Mr Knowledge", and so it seems justifiable to see him as one of the most influential thinkers in the knowledge management movement.

After gaining much publicity, and good assessments, the theories of Nonaka have been widely criticized especially in the Western world. Here this main criticism is used as a tool when aiming to get a deeper understanding of Nonaka's theories for the needs of the FNDC and other organizations.

Critical analysts have often focused on Nonaka's main book *The Knowledge Creating Company* (1995). His article with Noburo Konno, *The Concept of 'Ba': building a foundation for knowledge creation,* published in 1998, has also been critically and explicitly analysed, as well as his above mentioned articles (1991a, 1994). But only a few have analyzed how his theories have developed after 1998[78] and no one in

[77] The writer of the present study stayed at Japan Advanced Institute of Science and Technology (=JAIST) during 2002-2003 where Nonaka was the first Dean of the Graduate School of Knowledge Science in 1997-2000. Since then he has arranged courses in knowledge management at JAIST twice a year. During the period in Japan the researcher participated in Nonaka's Knowledge Management course at the University of Hitotsubashi, Tokyo, from the 1st of October 2002 to the 17th of January 2003.

[78] Carl Bereiter (2002) offers an exception, citing also the *Enabling Knowledge Creation* by von Krogh, Ichijo, Nonaka, 2000.

the Western world has explicitly analyzed how his theories have evolved before the 1990s, during the 1990s and in the past years, aiming to gain a holistic understanding of Nonaka's theories.

The consequence of this narrow focus of the criticizers is an overemphasis on the SECI model and a lost sight of the wider framework of Nonaka. It seems to be justifiable to assume that with this kind of wider perspective the re-evaluation of the criticism and also Nonaka's theories will gain some additional validity. The proper framework for focusing on the theories of Nonaka is the framework of the Organizational Knowledge Creation Theory presented in **figure 4.2.**

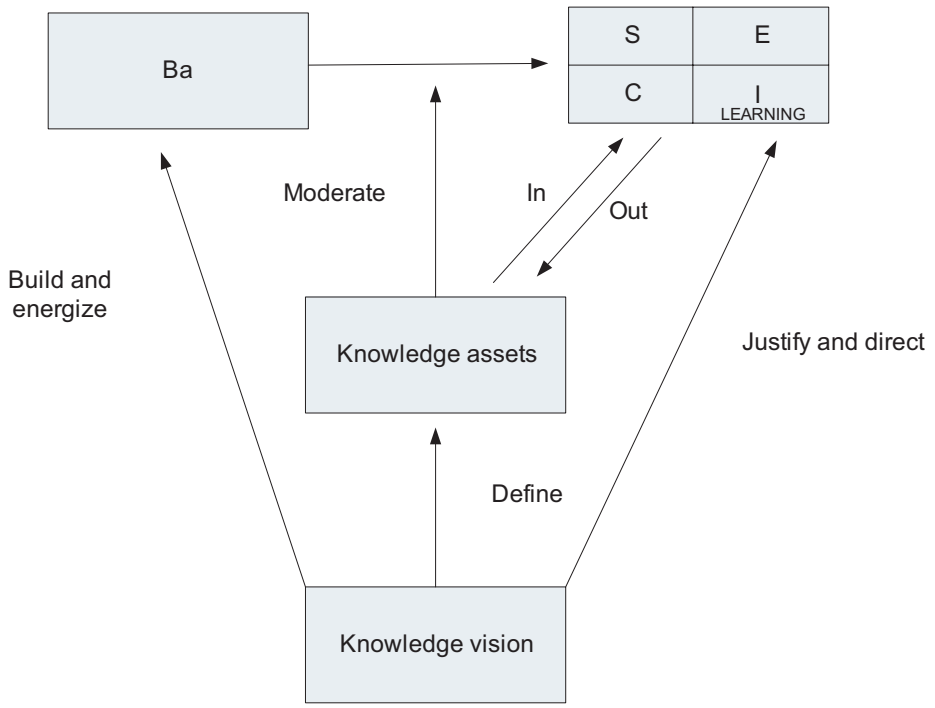

Figure 4.2 Nonaka's framework of the Organizational Knowledge Creation Theory
Source: Nonaka, Toyama & Byosiere 2001, 507.

In this framework the four[79] layers of knowledge creation interact with each other in order to form the knowledge spiral that creates knowledge. The four layers are:

– The process of knowledge creation through socialization, externalization, combination, and internalization (SECI), the

[79] Originally the framework has three layers but by adding the fourth layer, the knowledge vision, the framework gets its holistic shape (cf. Nonaka, Toyma & Byosiere 2001) presented in figure 4.2.

knowledge-conversion processes between tacit and explicit knowledge.
– *Ba*, the platforms for knowledge creation.
– Knowledge assets, or the inputs, outputs, and moderator of the knowledge-creation process.
– Knowledge vision affecting and giving direction to the knowledge-creation process. (Nonaka, Toyama, Byosiere & 2001, 507)

The cornerstones of the theories of Nonaka have been identified as follows:

– An organization cannot create knowledge without individuals and knowledge is created through the SECI process.
– Knowledge has its tacit and explicit parts and is neither information nor data.
– Knowledge vision and organizational intention are a driving force for a knowledge creating organization.
– *Ba* provides a platform, a shared context in motion, for knowledge creation.
– Systematic knowledge creation involves not just the top management but everyone in the organization, with middle managers serving as the key knowledge engineers.
– The knowledge creation process cannot be managed but it can be enabled by creating necessary conditions for effective knowledge creation.
– Knowledge assets, which are the inputs and outputs of the knowledge-creation process, form the basis of organizational knowledge creation.
– Along the path of knowledge creation, there are many fundamental dichotomies to be dealt with, and dialectic thinking and acting is needed. (cf. Nonaka & Takeuchi 1995; Nonaka & Toyama 2002, 2003; Nonaka, Toyama & Byosiere 2001; Takeuchi & Nonaka eds. 2004)

In the following analysis the cornerstones of Nonaka's theories are analyzed in a more detailed manner.

4.3.1. Knowledge creation needs also individuals and knowledge is created in the SECI process

As mentioned above, SECI stands for socialization, externalization, combination, and internalization. Socialization is the process of bringing together tacit knowledge through shared experiences in day-to-day social interaction. Because tacit knowledge is context-specific and difficult to formalize, the key to acquiring tacit knowledge is to

share the same experience through joint activities. Externalization is the process of articulating tacit knowledge as explicit concepts. The successful conversion of tacit knowledge into explicit knowledge depends on the sequential use of metaphors, analogies, and models. Combination is the process of systemizing concepts into a knowledge system. This mode of knowledge conversion involves combining different bodies of explicit knowledge. Internalization is the process of embodying explicit knowledge as tacit knowledge, and learning-by-doing is emphasized. (Nonaka & Takeuchi 1995, 62–70; cf. Nonaka & Toyama 2003, 495–498; see also Nonaka, Byosiere, Borucki & Konno, 1994)

Nonaka stresses that knowledge is created only by individuals: an organization cannot create knowledge without its individuals. But he does not mean that an organization does not need social communities to create knowledge. Nonaka has emphasized that although the knowledge-creation spiral starts at the individual level, it is elevated dynamically from this lower level to higher ontological levels (like teams, groups, and communities of interaction (Nonaka & Takeuchi 1995, 57–59; Nonaka, Toyama & Byosiere 2001, 497–498).

It is unjustified to make the conclusion that in Nonaka's theories the unit of analysis is just an individual human being (cf. Ahonen, Engeström & Virkkunen 2000, 282). Nonaka presents the SECI model in universal terms, explaining how it can be used on all "ontological levels", ranging from individual human beings to supranational organizations (Nonaka & Takeuchi 1995, 72–73; Corno, Reinmöller & Nonaka 1999). Hence, it seems to be reasonable to understand the SECI model as a flexible heuristic rather than as a strict algorithmic rule (Engeström 1999a; Hakkarainen, Palonen, Paavola & Lehtinen, 2004) for fruitful knowledge creation.

The later developments of the knowledge-creating theory have justified the conclusion that the theory is more or less a metaphorical and heuristic tool for understanding the key features of the knowledge creation system. In the revisited knowledge-creating theory dynamic interactions among individuals, the organization, and the environment are stressed. Knowledge is created in a spiral that goes through seemingly antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, deduction and induction, and creativity and efficiency. Knowledge creation is conceptualized as a dialectical spiral or process, in which various contradictions are synthesized through dynamic interactions among individuals, the organization, and the environment. (Nonaka, Toyama & Nagata 2000; Nonaka & Toyama 2002, 2003; Takeuchi & Nonaka eds. 2004)

Dialectical thinking has a long history in Western philosophy, from Plato to Hegel and to Bhaskar (Nonaka & Toyama 2002[80]), but its Eastern roots should also be remembered. In Eastern philosophies the trails go along Nishida (1958, 1970, 1990), Ilyenkov (1977, 1982), Marx and Engels. It is interesting to recognize that also the cultural-historical activity theory uses dialectics as a background theory when explaining its key principles (Engeström 1987, 2001a).

To explain the synthesizing processeses and the emergence of structure, the structuration theory of Anthony Giddens (1984; chapter 2) and critical realism (Bhaskar) have been used (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004). Critical realism explains (Bhaskar 1975, 12–20) how reality consists of three different layers: empirical, actual, and real. The layer of the real contains structures that have powers and liabilities from which observable events emerge. The domain of the actual consists of these events and behaviours and the domain of the empirical consists of our experiences. Thus, social phenomena emerge from the deep underlying real structures, become actual, and then empirical. Hence, although social structure is dependent upon individuals' actions it is irreducible to them and ontologically autonomous from them.

According to Nonaka and Toyama (2003), knowledge is created through interactions between human agency and social structures. Nonaka and Toyama cite Giddens, who explains how harmoniously the two levels of consciousness (practical and discursive consciousness) interact in our social reality. Nonaka and Toyama describe how the inherent contrast between the levels of consciousness is the driving force of the dialectical spiral. Interestingly, they fail to recognize how also the Giddensian structuration theory gives an explanatory role to the inherent contrasts; namely, to the contradictions. In the following subchapter (see 4.4) the analysis turns to the concept of contradictions.

Nonaka's theories have been criticized for being representatives of the mind-as-container metaphor (Bereiter 2002). To justify his argument Bereiter emphasizes that to Nonaka knowledge is things in the mind, although knowledge is partly something out in the world (Bereiter 2002, 176). Nonaka stresses that on the other hand knowledge means a dynamic human process of justifying the personal belief toward the "truth" (Nonaka & Takeuchi 1995, 58; Nonaka & Toyama, 2002) but it is also a reality viewed from a certain angle (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004). Hence, in knowledge creation, one tries to see the entire picture of reality by interacting with those who see the reality from other angles. In practice this means

[80] For additional reading the following can be recommended: Gadamer (1976); Bhaskar (1993); Falmagne (1995).

a continuous pursuit to get an entire and correct picture of the reality (the "truth") by ongoing organizational communication and collaboration.

Bereiter's mind-as-container claim is rather misleading because especially nowadays Nonaka emphasizes dialectical synthesis of such seemingly antithetical entities as mind and body or an individual and the society. Nonaka synthesizes both rational and arational human capabilities (e.g. intuition, emotions) for the full use of organizations and the global society (cf. Wierzbicki & Nakamori 2005, 1).

It seems justifiable to say that one of the paradoxes of Nonaka's theories is that when he emphasizes the fundamental role of the individual in the knowledge creation process, he at the same time also treats human beings more or less as "black boxes" and as "given" (Bereiter 2002; Hakkarainen, Palonen, Paavola & Lehtinen 2004, 9).

4.3.2. Knowledge has its tacit and explicit parts and is not information or data

As mentioned above, Nonaka has emphasized the difference between data, information and knowledge. Having such a long career as a management researcher and teacher he has lived through the times of information processing to the current times of knowledge creation and management. The fact seems to be that concepts like "information" and "knowledge" or "knowing" have often been used interchangeably and ambiguously (cf. e.g. Toffler 1990; Webster 1995, 83; Sveiby 1997, 24; Castells 1996, 17, 1998; Bell 1973, 175).

For instance Manuel Castell's widely cited trilogy *The Information Age* (1996, 1997, 1998) pays little attention to the definitions of concepts like knowledge and information. Castells (1996, 17) states that he has no compelling reason to improve on Daniel Bell's definition (1973) of knowledge or Marc Porat's (1977) definition of information[81]. Consequently, Castells sees both information and knowledge as organized statements of facts communicated systematically and the difference between them stays doubtful.

The theories of Nonaka seem to give some tools to make the difference more identifiable. Nonaka gives some clarification to the essential difference between information and knowledge by reminding about two aspects of information: syntactic and semantic (Nonaka

[81] According to Bell (1973, 175) knowledge is a set of organized statements of facts or ideas, presenting a reasoned judgment or an experimental result, which is *transmitted* to others through some communication medium in some systematic form (italics added). According to Porat (1977, 2 quoted in Castells 1996, 17) information is data that have been organized and communicated.

1988a, 1991b). The syntactic aspect concerns the Shannonian physical information in bits in which there is no attention paid to any inherent meaning. Although Shannon and Weaver[82] (1949: 1998) started their analysis on three levels (technical, semantic and effectiveness), they concluded that the separation into three levels is really artificial and undesirable due to the fact that semantic aspects are irrelevant to the technical engineering problems.

On the other hand, Nonaka has explained that semantic aspects are crucial for all kinds of organizations. In a sense organizations have to be seen living in a middle of information ambiguity or chaos, trying selectively identify semantic information from the environment to form order (physical and mental patterns as organizational structures, systems, visions, concepts, or values) out of the chaos. But even more interestingly, Nonaka reminds us that also syntactic aspects of information are useful for an organization because the two aspects of information will actually complement each other, resulting in greater efficiency (Nonaka 1991b[83]). In other words it could be said that all three Shannonian levels of analysis are still needed when analyzing the effectiveness of communication.

For Nonaka information is a necessary medium or material for eliciting and constructing knowledge because it affects knowledge by adding something to it or restructuring it (Nonaka & Takeuchi 1995, 58–59). First, knowledge, unlike information, is about beliefs and commitment. Knowledge is a function of a particular stance, perspective, or intention. Second, knowledge, unlike information, is about action. It is always knowledge to some end. Third, knowledge, like semantic information, is about meaning. As Bateson (1972, 453) puts it, information is a difference which makes a difference (in a knowledge). (cf. Nonaka & Takeuchi 1995, 58–59)

Mainly based on the philosophies of Polanyi (1966), Nonaka has proposed that there are two types of knowledge: tacit knowledge and explicit knowledge (Nonaka & Takeuchi 1995). Tacit knowledge is seen to be personal, context-specific, and therefore hard to formalize

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[82] Communication is difficult to define partly because the term seems to be one of the most overworked terms in the English language (Littlejohn 2002). It could be said that the classical model of a communication event (A-> B = X) has been heavily influenced by the theories of Shannon and Weaver (Taylor 1993, 256-257; Aula 1999) but also Lasswell (1948; "who..says what..in which channel..to whom..with what effect) and Bavelas (1948, 1950; Kurt Lewin's student).

[83] Nonaka does not elaborate other aspects of information but concentrates on the difference between information and knowledge. To those interested in knowing more about other aspects of information, the following cognitive trails could be recommended. Yehoshua Bar-Hillel (1964) has developed with Rudolf Carnap a theory for semantic information further elaborated by Doede Nauta (1972) as a pragmatic information theory. Interestingly e.g. the FRISCO (1996) report goes also on a higher semiotic layer than pragmatic – to the social layer (i.e. shared interests, beliefs and commitments).

and communicate. As Polanyi (1966, 4) puts it, "we can know more than we can tell".

As has been already stated, Nonaka's knowledge-creating theory is a fruitful metaphorical and heuristic resource to shift our thinking while trying to seek essential questions along the path to effective knowledge creation and organizational success. Remembering this, it is useful to recognize how Nonaka has criticized the general overemphasis of explicit and codified knowledge, reminding us Westerners of the so-called "paralysis by analysis" syndrome. By emphasizing tacit knowledge Nonaka tries to propose that in order to stay competitive also in the future we should not forget that knowledge involves values, hunches and emotions, or that, in other words, our competitiveness and well-being depends a lot on our capability to use our human resources while avoiding the trap of technological determinism.

Nonaka's tacit-explicit distinction has been somewhat ambiguously defined, making it possible for others to misinterpret his position in this case. It has been stated that Nonaka sees tacit and explicit knowledge as totally separate (e.g. Tuomi 1999[84]; Cook & Brown 1999; Brown & Duguid 2001) although Nonaka sees them as mutually complementary entities[85]. Undoubtedly, Nonaka is far more interested in knowing how to create new knowledge, causing him to undervalue the importance of "old" public and cultural knowledge (Bereiter 2002; Hakkarainen, Palonen, Paavola & Lehtinen 2004). But do we really need to miss our great opportunity to "stand on the shoulders of giants" when we develop our tacit knowledge in order to make novel combinations of the "old" public and cultural knowledge for present purposes (cf. the combinatorial character of innovation; Tuomi 2002; Kogut & Zander 1992: 1997; Teece, Pisano & Shuen 1997; Brown & Duguid 2001; von Hippel & von Krogh 2003; von Hippel 2005)?

Is tacit knowledge for Nonaka either an individual or a social feature? The case seems to be such that for Nonaka tacit knowledge is partly routinized and embedded within organizations and the practices of organizations. It seems to be justifiable to agree with Bereiter (2002; cf. also Hakkarainen, Paavola, Palonen & Lehtinen 2004) that even the individualistic concept of the tacit knowledge of Nonaka tends to be a mystified object, but even more mystified it will be if the concept is extended also to the societal domain.

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[84] Later Tuomi (2002, 120) has admitted his misinterpretation of Nonaka's position.

[85] According to Nonaka's latest conceptualization knowledge is not *either* explicit or tacit. Knowledge is *both* explicit and tacit. Knowledge is inherently *paradoxical*, since it is made up of what appears to be two opposites. (Takeuchi & Nonaka 2004, 4; italics added)

The debate concerning the exact nature of tacit knowledge seems to be stuck on the level of appropriate understanding of Polanyi's, Ryle's and Nonaka's writings (cf. e.g. Tsoukas 2002; Li & Gao 2003) but the way out of this impasse is not just reanalyzing these thinkers. If Nonaka has black-boxed and mystified objects like "tacit knowledge", we seem to need more social scientific tools than eclectic management theories or analyses on the philosophical level only. The demystification needs to be done by travelling along the cognitive trails made by other disciplines. Later, in chapter 8, the analysis comes back to this issue when the boxes of tacit knowledge and the human being are opened.

4.3.3. Knowledge vision and organizational intention as driving forces for development

Some researchers have kept asking what is the force that drives the knowledge spiral itself (Scharmer 2001, 71, 74; Engeström 1999a; Tuomi 1999, 331). The knowledge spiral is driven mostly by organizational intention, inherent contrasts (cf. contradictions) and enabling contextual conditions. In subchapter 4.3.5 the Nonakaian enabling conditions will be conceptualized and analyzed, but now the focus shifts to the organizational intention and the vision.

Creating a vision or a dream is said to be the task of top management, while middle management develops more concrete and understandable concepts implemented by frontline employees. Middle managers try to solve the contradiction between what the top management hopes to create and what actually exists in the real world. In other words, the top management's role is to create a grand theory, while the middle management tries to create a mid-range theory that it can test empirically within the company with the help of the frontline employees (Nonaka & Takeuchi 1995; Nonaka, Toyama & Byosiere 2001; Takeuchi & Nonaka eds. 2004). Paradoxically, Nonaka favours old fashioned hierarchic and centralized methods for vision making, although a vision gets its exact shape and meaning in the ongoing dialectical process between the top management and other employees. It is crucial to recognize that without real involvement and initiatives of the lay workers the form and the consequences of a vision vary a lot.

It has been traditionally argued that a vision could be an effective tool for societal guidance. Unfortunately, in reality visions tend to be just ambiguous statements made in a top-down manner and having relatively minor effects on the organization in question. Not just the content but also the manner how visions are made needs to be

reconsidered. The concept of knowledge vision needs to be introduced and elaborated as a tool for the needed shift of perspective.

The knowledge vision could be seen to have two main components: an "absolute value system" or core ideology (core values, the mission or core purpose) component, and a "relative value system" or the envisioned future component (Collins & Porras 1994; Collins 2001; Nonaka, Toyama & Byosiere 2001; Nonaka & Toyama 2002; Collins & Porras 1994[86]). The core ideology of the absolute value system plays the role of an idealistic potential, always differing from the current behaviour and reality but still energizing the individuals in question.

By a "relative value system" Nonaka means a component that focuses on the environment of the firm. If the vision also determines how the knowledge base will evolve in the long run (Nonaka, Toyama & Byosiere 2001, 506), the purpose of this component of the vision should be to explain how this relation seems to be evolving in the future. As already mentioned, Nonaka sees how crucial individual intuitions, insights and hunches are for a knowledge creating organization making its knowledge vision. Due to the lack of explicit connections to public and cultural knowledge the Nonakaian organization tends to forget that not just intuitions and hunches, but also deliberate R&D activities and science are needed for designing a good knowledge vision[87].

4.3.4. *Ba* and communities of practice: integrating learning into knowledge activities

Although simplifying in terms, it is possible to say that communities of practice are those communities where learning actually happens (Lave & Wenger 1991; Wenger 1998; Brown & Duguid 1991, 2001), and *ba* is the "place", "space" or the "context" where knowledge is created (Nonaka & Konno 1998; Nonaka, Konno & Toyama 2001; Nonaka, Toyama & Byosiere 2001; Nonaka & Toyama 2003). A dialectical analysis seems to be a proper choice in order to solve the unnecessary confrontation between the concepts of *ba* and communities of practice.

Ba provides a platform, a shared context in motion, for knowledge creation (Nonaka, Toyama & Konno 2001, 23; Nonaka & Toyama 2003, 6). *Ba* exists at many levels, and these levels may be connected to form a greater *ba* (known as *basho*). Just as the *ba* for individuals could be

[86] It is interesting to recognize how close the present description of the knowledge vision comes to the Sengean (1990) view on visions (subchapter 4.1).
[87] For additional cognitive trails to elaborate this point see Rosenberg (1974, 1992); Nelson & Winter (1982); Cohen (1995); Mowery (1995); Boerner, Macher & Teece (2001); Fleming & Sorenson (2004).

seen as the team (cf. alternatively or additionally the communities of practice), the organization in turn could be seen as the *ba* for the teams (cf. alternatively the communities of practice).

So far mainly the differences between the concept of communities of practice and the concept of *ba* have been emphasized. These have been seen as follows:

- *Ba* is seen as a place where knowledge is created, but communities of practice are just a place to learn and not to create knowledge.
- *Ba*'s boundaries are fluid and can be changed quickly, but the boundaries of communities of practice are firmly set.
- *Ba* has a here-and-now quality, while communities of practice are constrained by their history; the membership of *ba* is not fixed: participants come and go, but in the case of communities of practice the membership is seen to be more fixed. (Nonaka, Toyama & Byosiere 2001, 499; Nonaka & Toyama 2003, 7)

It is obvious that there are differences between the concepts of *ba* and communities of practice, partly because they emerge from different cultural contexts. First we have to analyze the "differences" mentioned above more carefully. It could be difficult to exclude the learning from the practices and routines in *ba* because every human being is continuously learning and habituated routines tend to emerge. So it comes obvious that within *ba* there happens learning as well as there can happen knowledge creation.

The theories of Nonaka and his colleagues are based on the confrontation between the theories of learning organizations (Senge 1990) and knowledge creation (Nonaka & Takeuchi 1995). Learning tends to be seen among knowledge-creation researchers as just learning-by-doing in the phase of internalization (Nonaka & Takeuchi 1995, 69), although when describing the phase of socialization they use apprenticeship as an example of effective learning (Nonaka & Takeuchi 1995, 63). Hence, it is illogical to assume that learning happens only in the phase of internalization. Therefore, the key issue is how to combine learning and knowledge creation fruitfully.

When comparing the concept of *ba* to the concept of communities of practice it becomes obvious that *ba* can be seen as more "dynamic" than the communities of practice. But it is worth noticing that also *ba* needs energy in order to become an active *ba* where knowledge is created. So there could be different *ba*s – "active" *ba*s and "passive" *ba*s (Nonaka & Toyama 2003, 7) – just as there are active and passive communities of practice.

There seems to be a need to briefly dive into the origins of the concept of *ba* and analyze the theories of Hiroshi Shimizu[88] and Kitaro Nishida, because the concept of *ba* was originally proposed by these academics (Nonaka & Konno 1998, 40). According to Shimizu (1995), although *ba* is alive in the daily life and social customs of Japanese people, it is far from the daily consciousness of those who have been busy in catching up with modern Western civilization. Due to this fact we have to focus on the Japanese culture because the roots of the concept of *ba* lie there.[89]

According to Shimizu a good introduction to *ba* is to understand the concept and function of *basho*. It was mentioned above that Nonaka has explained that a greater *ba* is *basho* (Nonaka & Konno 1998, 41). But what is *basho* actually according to Shimizu and Nishida? The word-to-word translation of "basho" into English may be "place" but it is not any semantic translation. "Sho" means "place" and so "basho" indicates the place where *ba* is present or emerges (Shimizu 1995, 68).

For Nishida *basho* means a *unity* of absolute contradictories, the absolute other and the self-determining universal or even absolute nothingness (Nishida 1970, 6, 28; cf. Nishida 1958, 1970, 1990). By *basho* Nishida stresses the need to understand ourselves as *insiders* rather than *outsiders* contrary to for example the Cartesian tradition. In a way Nishida offers a way to overcome the Cartesian split between many kinds of "opposite" entities (e.g. mind – body, we – they, our civilization – nature). Maybe even between *ba* and communities of practice?

First of all we should focus on the concept of *basho* and to its contradictive nature. Nonaka explains how inherent tensions (cf. contradictions) play an essential role and give energy to be used in developmental activities. In a way a greater awareness of *basho* means more contradictions and potentially more energy to be used in purposeful development. When emphasizing *basho,* instead of *ba (*a shared context in motion), the possibility to recover *basho* potentially increases. In other words emphasis on *basho* means also emphasis on unity and consistency (Shimizu 1995, 72–73) in a larger context – ultimately in a global context.

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[88] The researcher has had an opportunity to discuss these issues personally with professor Hiroshi Shimizu during his stay in Japan in 2002 to 2003.

[89] Shimizu (1995) explains how *ba* is embedded in social life. The present researcher sees that *ba* is *potentially* embedded in social life but first of all it is a Japanese cultural phenomenon. The emphasis on culture, instead of e.g. social life, means an emphasis on the deepest levels of culture (unconscious phenomenon) and its culturally evolutionary development during history (cf. Shimizu 2001).

If then one of the main principles of *basho* is the consistency, is it actually justifiable to divide *ba* into four types of *"sub-ba"* corresponding to the four stages of the SECI model:

– Originating *ba.*
– Dialoguing *ba.*
– Systematizing *ba.*
– Exercising *ba*. (Nonaka, Konno & Toyama 2001, 19)

Assuming the SECI model to be more or less a heuristic tool to give guidance for a dialectical knowledge creation process, the need for abstract "sub-bas" is a limited one[90]. The main question seems to be not how many "sub-bas" we have, but how we can energize these shared contexts in motion.

4.3.5. The knowledge creation process cannot be managed but it can be enabled

In subchapter 4.3.3 a fundamental question was posed: "What is the force that drives the knowledge spiral itself?" It was shown that when seeking an answer to such a question some theoretical sources have been used by Nonaka (critical realism and structuration theory). But more explanatory resources are needed if the aim is to conceptualize the enabling conditions for organizational knowledge creation.

According to Nonaka knowledge-producers and leaders must supply the necessary conditions for the emergence as follows:

– Fluctuation and creative chaos.
– Redundancy.
– Requisite variety.
– Autonomy.
– Love, care, trust, and commitment. (Nonaka & Takeuchi 1995; Nonaka, Toyama & Byosiere 2001, 508–510; Takeuchi & Nonaka eds. 2004)

Since the 1980s Nonaka has been one of the organizational researchers who emphasize the centrality of ambiguity and chaos to organizations (cf. e.g. Nonaka & Johansson 1985; Nonaka 1988b; Imai,

[90] In his careful analysis Tuomi (2002) argues how the four different types of *ba* proposed by Nonaka collapse into two: a *ba* or a layer for combining existing resources and a *ba* or a layer for interaction and novel creation of resources. On the community layer the meaning is emerging and "above" it on the interaction layer sensemaking and communication take place. Cf. also Bhaskar's domains of the actual and the empirical (Bhaskar 1975, 14).

Nonaka & Takeuchi 1988). The main "chaos-theoretical" article of Nonaka was published in 1988 in the California Management Review (Nonaka 1988a) and these influences have ever since been explicit in his research (Nonaka 1994; Nonaka & Takeuchi 1995; Nonaka, Reinmöller & Senoo 1998; Nonaka, Toyama & Konno 2000).

According to Nonaka, the most noteworthy principles are those concerning the self-organization that emerges from the reality explained by natural scientists, e.g. physicists and theoretical biologists[91]. It becomes obvious that Nonaka does not draw a strict line between natural and social sciences, showing his positivistic stance explicitly (cf. chapter 2).

As a background it is useful to be aware of the evolved levels of inquiry (Jantsch 1980) or paradigms influencing systems thinking (Ståhle 1998). The paradigms of systemic thought are presented in **figure 4.3.**

Paradigm	Originator	Type of system	Research interest	Operative interest
I Closed systems	NEWTON	Static Deterministic Mechanistic Cybernetic	Principles, laws	Predicting, Controlling
II Open systems	Von BERT-ALANFFY	Near Equilibrium Equifinal Living	Feedback processes	Steering, Sustaining
III Dynamic Systems, Dissipative systems	LORENZ, PRIGOGINE, MATURANA, VARELA	Far-from-equilibrium Uncontrollable Emerging	Spontaneous organization	Understanding and cooperating with natural environment

Figure 4.3 The paradigms of systemic thought
Sources: Cf. Ståhle 1998, 43; Jantsch 1980.

At this stage it needs to be assumed that the above scheme has also some consequences for the theories of Nonaka. Further on it seems to be justifiable to assume and expect that getting familiar with a

[91] Nonaka tends to refer to such physicists as Jantsch (1980) and Prigogine (1980; with Stengers, 1984) and theoretical biologists like Maturana and Varela (1980, 1992) and Varela, Thompson and Rosch (1991).

new systemic paradigm demands open-mindedness and willingness to make it possible for a shift of mind or a gestalt switch to happen in oneself (cf. Kuhn, 1962: 1970, 122). This means also that we have to understand the conceptualized enabling conditions rather than follow blindly the "checklists" offered for example by Nonaka.

According to Nonaka, the physicist Ilya Prigogine (with Isabelle Stengers 1984) has demonstrated that nonequilibrium may be a source of spontaneous formation of order or organization (Nonaka 1988a). Based on Prigogine's publication Nonaka claims that the new ordering principle has been called "order through fluctuation" or "order out of chaos". A self-organizing system thus forms order through fluctuation while reacting selectively to information (syntactic versus semantic information) from the environment. Nonaka (1988a, 59-60) stresses that the order is not formed simply by processing information but by creating information and especially semantic information (i.e. creating meaning).

Interestingly, Nonaka tries to explain explicitly how an organization, living in a chaotic environment, has to intentionally harmonize between external chaos and internal, although temporary, order (Nonaka, Reinmöller & Senoo 1998, 678[92]). Occasionally the task of the leaders is to create "chaos" intentionally by challenging the goals and visions (Nonaka & Takeuchi 1995)[93].

The term "redundancy" may sound like something to be avoided because of its connotations of unnecessary duplication, waste, and information overload. For Nonaka redundancy means the existence of information that goes beyond the immediate operational requirements of organizational members. In organizations, redundancy refers to intentional overlapping of information about business activities, management responsibilities, and the organization as a whole. Redundancy of information promotes the knowledge-creation process in two ways. First, sharing redundant information fosters the sharing of tacit knowledge by familiarizing one to other perspectives in the organization. Second, redundancy of information helps organizational members understand their position in the organization by letting them see themselves from the outside. Thus, redundancy of information provides the organization with a self-control mechanism that keeps it heading in *a shared and intended direction*. (Nonaka & Takeuchi 1995; Nonaka, Toyama & Byosiere 2001; italics added)

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[92] Aula (1999) has, partly on the basis of the theories of Nonaka, coined a double function of communication (dissipative and integrative functions) challenging the traditional unidirectional Shannonian communication model.

[93] Actually it is not chaos in a scientific sense but "creative chaos" and some kind of temporary organizational state of tension.

As mentioned above, one way to explain knowledge is to claim that it is a reality viewed from a certain angle (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004). Hence, in knowledge creation, one tries to see the entire picture of reality by interacting with those who see the reality from other angles (Nonaka & Toyama 2003). One tries to avoid ontological ills and fallacies by getting a relatively correct description of the current reality. Therefore, redundancy means also an awareness of several angles and perspectives shared by the personnel of the organization.

Nonaka emphasizes that with a high level of information fluctuation a firm could produce quite essential new concepts for the use of its production needs. But how then does redundancy affect the formulation of new concepts? How indeed are concepts formulated and how do they emerge? It seems that Nonaka's explanations about these issues are rather ambiguous and need to be developed; just emphasizing redundant information is not enough if we try to understand what an organization could and should do for its enabling conditions of knowledge creation.

In order to deal with challenges posed by the environment, the internal diversity of an organization has to match the variety and complexity of the environment (Nonaka & Takeuchi 1995; Nonaka, Toyama & Byosiere 2001; Ashby 1956); hence the requisite variety. Developing a flat and flexible organizational structure in which the different units are interlinked with an information network is one way to deal with the complexity of the environment. As other means to increase requisite variety Nonaka mentions also frequent organization changes and rotation of personnel (Nonaka & Takeuchi 1995, 83). Requisite variety and redundancy are concepts developed in the field of cybernetics and cross-appropriated to various fields of social sciences. Hence, some basic understanding of cybernetics is needed when evaluating the appropriateness of cybernetic concepts for social sciences.

The term "cybernetics" was coined by Norbert Wiener in the beginning of the 1940s and it was defined as the science of control and communication, in the animal and the machine (Wiener 1948: 1965, 1954; Ashby 1956, 1; Bowker 1993; Bailey 1994; Jackson 2000; Littlejohn 2002; Rav 2002). In cybernetics the reality seems to offer a set of possibilities ("redundancy") and so the "redundancy" is not a state of affairs to be obtained but the way how things are in our reality (Ashby 1956, 40).

According to Ashby (1956) one way of blocking the flow of disturbances is to block them passively. Another way to handle these complex and mobile disturbances is to use defence that is equally

complex and mobile (ibid, 201). In this sense Ashby has coined the law of Requisite Variety as follows: "Only variety can destroy variety" (ibid, 207). As mentioned above, to Nonaka, organizations live in a complex environment needing to have a required variety to be able to "destroy" variety ("redundancy").

Ashby continues to stress that at the same time the quantity of control exerted by this "diversified" organization is still bounded. This boundedness needs to be overcome by the decision about "the list of systems variables" in order to devote its limited powers to control these "key variables". Also Ashby claims that it is not enough to start talking about systems but one needs to conceptualize the system. In the early cybernetics the system meant not a thing, but a list of variables that tries to control its redundant reality.

Redundancy and requisite variety seem to be linked to the autonomy mentioned by Nonaka. If then an organization needs variety to meet the redundancy posed by the complex environment, also autonomy of the individuals is crucial if the required variety is going to be achieved. But to be effectively autonomic in an organization requires redundant information allowing one to act effectively, keeping the organizational whole in the mind. Interestingly, redundancy of information facilitates the interchange between hierarchy and nonhierarchy, allowing an organization to develop itself as an autopoietic organization (Nonaka & Takeuchi 1995; Nonaka, Toyama & Byosiere 2001; cf. Maturana & Varela 1980).

In order for knowledge to be shared and for the knowledge-creation process to occur, there needs to be strong love, caring, and trust among the organizational members. Knowledge-producers should also be positive thinkers and should avoid having or showing negative thoughts and feelings (Nonaka, Toyama & Byosiere 2001). Knowledge seems to be mostly created by communication and shared activities, which should not be taken as given. They do have some obstacles and blocks but for some reason Nonaka does not concentrate on these cultural phenomena.

The paradigms of systemic thought were presented in **figure 4.3.** It is obvious that Nonaka draws rhetorical resources from all of the systemic paradigms as the following analysis shows. Cybernetics, not necessarily the later developed second-order cybernetics, can be classified to the first paradigm (Ståhle 1998). According to Ludvig von Bertalanffy (1981) (the founding father of the second paradigm and the general systems theory), cybernetics and related approaches showed many parallelisms with the general systems theory, but fundamental differences existed: classical cybernetics dealt with closed

systems and the general systems theory with open systems. Von Bertalanffy (1981) claims that the classical cybernetic feedback scheme explains[94] how feedback regulation is a linear and unidirectional (although circular) homeostatic process, but in open systems the feedback is multivariable dynamic interaction. In a way the classical cybernetic feedback scheme is reductionist, simplifying the reality too much.

Von Bertalanffy draws a line between human beings and other features by saying that homeostasis is inappropriate as an explanatory principle for non-utilitarian human activities, not serving the primary needs of self-preservation and survival and their derivates. According to von Bertalanffy (1981) human needs are partly based on symbolic rather than biological values.

In her foreword to Niklas Luhmann's *Social Systems* (1995) Eva Knodt explains how the book accomplishes in the social realm what Maturana and Varela have done for cognitive biology and Prigogine's work on non-equilibrium thermodynamics for physics. As Knodt claims, the adaptation of the concept of autopoiesis to realms other than biology have encountered considerable obstacles; is there any categorical distinction between human and non-human nature and are there some limits to the use of for example physics in social sciences?[95] Maybe there still *should* be.

Focusing on the theories of Nonaka from the chaos-theoretical point of view, some important questions could be put in the form of **Table 4.1:**

[94] Orthodox behaviorism (Watson-Skinner) viewed the animal or human organism as a black box, where only input-output relation mattered. In 1943 cyberneticists (i.e. Rosenblueth-Wiener-Bigelow) but light into the box by introducing purpose and explaining the importance of goals and their teleological guiding aspects and controlling feedback loops. (Bowker 1993; Rav 2002; Littlejohn 2002)

[95] Already in chapter 2 the unawareness of the "category mistake" was shown and analysis on this issue will follow below. Also Maturana and Varela have debated the favouring and denying the applicability of autopoiesis to social systems (1980, 1992); cf. also Mingers (2003); Tuomi (1999, 192–200); Bailey (1994).

Table 4.1 Emerging questions concerning Nonaka's theories

Nonaka's framework	Emerging questions
Vision, knowledge vision	What does a long-term view without "paralysis by analysis" mean for planning procedures? Could we use social science as a tool in the visionary process?
Enabling conditions - fluctuation and creative chaos - redundancy and requisite variety - autonomy - love, care, trust, and commitment	Is there a difference between e.g. human beings and machines? If there is a difference, what does the difference mean for organizational control and communication activities? What are the main obstacles to communication and how could these be avoided?
SECI process	What will be revealed if the black box of the human being is opened? If the tacit knowledge is demystified what will we get instead of it? What is the relation between learning, knowledge and knowing?
Ba	How to reasonably synthesize the concepts of *ba* and communities of practice?
Knowledge assets	What does the synthesis of private and cultural knowledge mean for knowledge creation and management?
Synthesizing capability	What role does contradictions play and how to explain the emergence itself? What is the social system and how to deal with its boundaries?

We will return to these questions and answer them in chapter 8.

4.3.6. Knowledge assets

According to Paavola, Lipponen, and Hakkarainen (2002) there is no explicit room for conceptual artifacts in the theories of Nonaka. But the holistic framework of Nonaka (presented in **figure 4.2)** enables us to see the potential of explicitly including knowledge assets or conceptual artifacts also in the Nonakaian framework[96].

Knowledge assets are categorized as follows:

– Experiential knowledge assets are the shared tacit knowledge that is built through hands-on experiences that are shared between the organizational members.
– Conceptual knowledge assets are articulated explicit knowledge like brand equity, product concepts, and product designs.
– Systemic knowledge assets are systematized and packaged explicit knowledge such as patents, licences, and manuals.

[96] Hakkarainen, Palonen, Paavola and Lehtinen (2004) claim that some of the metaphorical ideas that lie behind Nonaka and Takeuchi's (1995) cases are clear instances of what Bereiter would call "conceptual artifacts". Hence, according to them there is implicit room for conceptual artifacts in the theories of Nonaka.

– Routine knowledge assets are the routinized and embedded tacit knowledge within the actions and practices of an organization. (Nonaka, Toyama & Byosiere 2001, 501–503).

Knowledge assets, which are the inputs and outputs of the knowledge-creation process, form the basis of organizational knowledge creation. Knowledge assets are defined as *firm specific* resources that are indispensable to the creation of the values of the firm (Nonaka, Toyama & Byosiere 2001, 501; Nonaka, Toyama & Konno 2000) divided into classes following the stages of the SECI model.

According to Nonaka an effective system and set of tools with which to evaluate and manage knowledge assets does not exist yet. Because of the tacit nature of knowledge, the current accounting system cannot adequately capture the value of knowledge assets. Another difficulty in measuring knowledge assets is that they are dynamic. Paradoxically there seems to be a need to build a system for evaluating and managing the knowledge assets of a firm more effectively, but on the other hand a taken snapshot of the knowledge assets at one point in time is never enough to evaluate and manage the knowledge assets properly (Nonaka, Toyama & Konno 2000; Nonaka, Toyama & Byosiere 2001). Therefore, a crucial question emerges: how does one measure an unmeasurable entity or to what extent is it a worthless act due to the fundamental unmeasurableness?

Again the main point is not whether we classify knowledge assets into separate categories but how we overcome the unmeasurableness and firm specificness of the knowledge assets. To overcome the firm specificness of the knowledge assets we must be reminded that knowledge can be seen as a reality viewed from a certain angle (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004). In a dialectical spiral, personal and cultural beliefs need to be synthesized to form a proper description of the reality. To do so one cannot neglect either individual or cultural knowledge (Hakkarainen, Palonen, Paavola & Lehtinen 2004), and also for knowledge-creating synthesizing processes both angles are needed. Especially the concepts of conceptual and systemic knowledge assets allow us to see how private and cultural knowledge need to be systematized and combined together[97].

The concept of conceptual artifacts proposed by Carl Bereiter (2002) seems to be an appropriate candidate when deepening our understanding of cultural knowledge. By his concept of conceptual artifacts Bereiter means that these things have an objective, out-in-

[97] As already mentioned in chapter 2, the present tension between science and the immediate experience of individuals needs to be overcome. One way to do so becomes possible in the systematization process.

the-world existence, but they are not physical objects. Conceptual refers to discussible ideas, ranging from theories, designs, and concepts down to plans. Artifact conveys that these are human creations that are created for some particular purpose.

4.4. Principles of the cultural-historical activity theory: critical evaluation

While focusing on the field of educational research and knowledge management, an obvious need to conceptualize a social system has been noticed. An appropriate unit of analysis needs to be chosen and its roots have to be understood. In order to explain man's nature and characterize the uniquely human aspects of behaviour we have to concern the fundamental question of: What is the relation between human beings and their environment, both physical and social? On the other hand we have to answer the question: Could we reduce this analysis to the level of an individual human being or not? If not, on what level should the analysis be done?

One both theoretically ambitious and practically relevant alternative is the cultural-historical activity theory (CHAT)[98]. CHAT was initiated by Lev Vygotsky (1896–1934) in the 1920s and early 1930s (e.g. Vygotsky, 1978, 1986). It was further developed by Vygotsky's colleague and disciple Alexei Leont'ev (1904-1979; 1978, 1981). It can be seen that the activity theory has evolved through five generations[99]. The first generation centered around Lev Vygotsky and the unit of analysis remained individually focused. This was overcome by the second generation, with Leont'ev as the main researcher. Leont'ev analyzed the activity at three levels but he never graphically expanded Vygotsky's original model into a model of a collective activity system.

A modeling especially for practical purposes was done by Yrjö Engeström (1987, 73–82), and it is depicted in **figure 4.4** as a representative of the third generation of CHAT:

[98] A weak link between the theories of Nonaka and Vygotsky should be recognized in Nonaka, Toyama and Konno (2000, 8) and Takeuchi with Nonaka (eds. 2004, 94). Nonaka's theories are also also linked to the cognitive trail of CHAT by the criticism of the interpretations of Lave and Wenger (cf. the confrontation between *ba* and the communities of practice).

[99] Engeström (2001a) explains how the activity theory has evolved through three generations of research. Despite of this the five generation scheme allows us to see how the unit of analysis has expanded and how the theory has got its present shape. In a way the studies of Jean Lave and Etienne Wenger (1991; Wenger 1998) offer an antithesis to the activity theory and by including them to the scheme a fruitful synthesis will emerge.

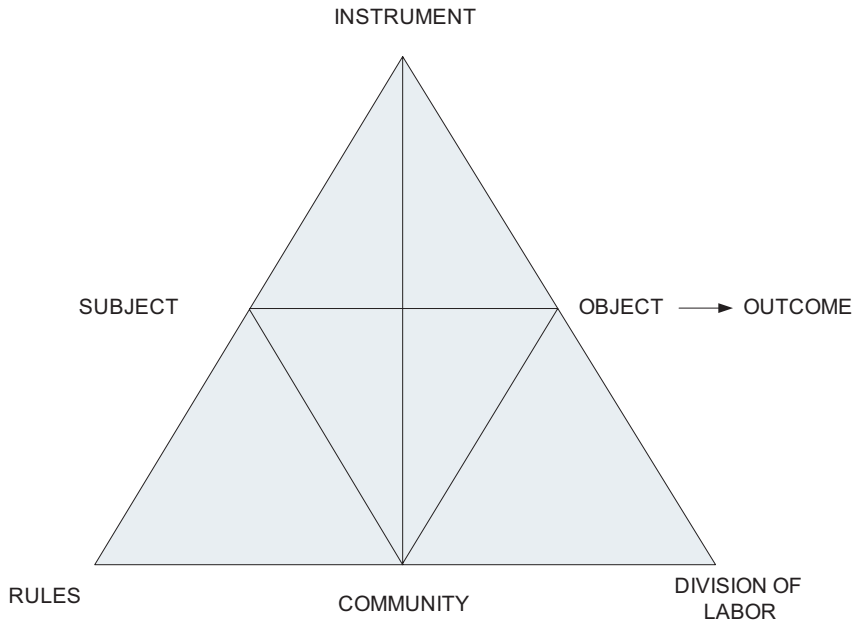

Figure 4.4 Engeström's activity system model
Source: Engeström 1987, 78.

The structure of the activity system developed by Yrjö Engeström is *the social system* of this research. The system allows us to keep the holistic nature of the phenomena in question in our sight while looking into its features. Simultaneously it helps us not to drown into the forthcoming "sea of information" and enables us to make sense of our social reality.

After several case-studies (e.g. Engeström, Engeström & Kärkkäinen 1995; Engeström, Engeström & Vähäaho 1999; Engeström 1999c; Tuomi-Gröhn & Engeström eds. 2003) it came obvious that the proper unit of analysis was not a single activity system but two, or even more, interacting activity systems, and so the fourth generation started to emerge. The fourth generation of CHAT tried to answer the question of how the boundaries between activity systems could be crossed effectively, because acting according to the "transmission metaphor" this object could not be obtained. Also knowledge creation theories seem to be in a need of similar tools and it is obvious that both research programmes share several interests when trying to understand organizational learning and knowledge-creation better (cf. e.g. Paavola, Lipponen & Hakkarainen 2002; Hakkarainen, Palonen, Paavola & Lehtinen 2004).

The research made by Jean Lave and Etienne Wenger (1991; Wenger 1998) is included in the scheme as a representative of the fifth generation of CHAT. As explained, CHAT has evolved by synthesizing the original individualistic tendency of Vygotsky by the social tendency of Leont'ev. In a way the concept of communities of practice developed by Lave and Wenger offers a balancing stick for us wavering between individual and social structures; in other words it guides us how to live in the middle (Wertsch 1998).

In its current shape, the activity theory may be summarized with the help of five principles (Engeström 2001a; for earlier summaries, see Engeström 1993; Engeström, Miettinen & Punamäki eds. 1999) that are useful as a point of departure for this analysis. First, the prime unit of analysis is a collective, artifact-mediated (both material tools and signs (psychological tools)) and object-oriented *activity system* with its network relations to other activity systems. It is assumed that human behaviour is understandable only when interpreted against the background of the entire activity system.

Secondly, an activity system is always a community of multiple points of view, traditions and interests. The multivoicedness is multiplied in networks of interacting activity systems, causing troubles and demanding actions of translations and operations, but on the other hand being a source of innovations.

Thirdly, activity systems take shape and get transformed over lengthy periods of time and their problems and potentials can only be understood against their own local history. Fourthly, contradictions are the central sources of change and development. Contradictions are not the same as problems or conflicts but historically accumulating structural tensions within and between activity systems. Fifthly, in activity systems there are hidden potentials for expansive transformations.

4.4.1. The main principles of Vygotsky

When trying to understand how and why the main principles of CHAT have evolved we have to start our analysis from the research of Lev Vygotsky. Lev Semenovich Vygotsky was known as a "Mozart of psychology" but it is essential to recognize that he was not only a psychologist but more or less a social scientists whose approach had an interdisciplinary flavor. Also it is a necessity to notice that in the former USSR the basic philosophy of Soviet psychology was based on Marxism-Leninism and undoubtedly also Vygotsky was influenced by

these ideas[100]. At the same time he was well aware of Western philosophical traditions and was influenced by these. So in order to critically evaluate the theories of Vygotsky and his followers we have to keep this in mind. As a balancing factor it is useful to remember, however, that Vygotsky's and his followers' research was and is oriented to developing concrete ways for dealing with practical problems (Wertsch 1985, 1991; Cole & Scribner in Vygotsky 1978; Kozulin in Vygotsky 1986) and so these theories are not just abstract theories without any concrete proof.

The three themes that form the core of Vygotsky's theoretical framework are:

- A reliance on genetic, or developmental analysis.
- The claim that higher mental functioning in the individual is derived from social life.
- The claim that human action, on both the social and individual planes, is mediated by tools and signs. (Wertsch 1985, 1991)

Genetic analysis in Vygotsky's approach is motivated by the assumption that it is possible to understand many aspects of mental functioning only if one understands their origins and the transitions they have undergone,

> We need to concentrate not on the *product* of development but on the very *process* by which higher forms are established…it is only in movement that a body shows what it is. (Vygotsky 1978, 64–65)

According to Vygotsky, ontogenesis can be understood only as a part of a larger, integrated picture involving several genetic domains (phylogenesis, sociocultural and ontogenesis, and microgenesis; Wertsch 1985, 54-57) and that the behaviour of acculturated humans is the product *of all three lines*[101] of development (Vygotsky quoted in Wertsch 1985, 27)

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[100] In his foreword to Vygotsky's *Thought and Language* (1986) Alex Kozulin quotes Vygotsky's explanation of the issue: "Immediate application of the theory of dialectical materialism to the problems of science, and particularly to biology and psychology, is impossible, as it is impossible to apply it instantly to history and sociology". Vygotsky also strongly opposed the method of casually picking and choosing quotations from the classics of Marxism. In words of Rene van der Veer and Jaan Valsiner (1994, 3) Vygotsky was both a Marxist (honouring some of Marx's and Engels' productive ideas) and non-Marxist (citing formalist poets and not bothering to take his contemporary Marxists seriously); he was part of the construction of "new society" but at the same time did not embrace the proletarian revolutionary ferment. Cf. also Vygotsky's "The Historical Meaning of the Crisis in Psychology: A Methodological Investigation" in Rieber & Wollock eds. (1997).

[101] Wertsch (1985) explains how occasionally the fourth genetic domain, "microgenesis", played a role in Vygotsky's analysis.

A fundamental feature of Vygotsky's genetic analysis is that he did not assume that one could account for all phases of development by using a single set of explanatory principles. At certain points in the emergence of a psychological process, new forces of development and new explanatory principles enter the picture. (Wertsch 1985, 19-20)

According to Scribner (1985), Vygotsky's work may be read as an attempt to weave three strands of history – general history (phylogenetical level), child history/life history (ontogenetic level), and the history of mental functions (social level) – into one explanatory account of the formation of specifically *human aspects of human nature*. Scribner has proposed an extension to Vygotsky's framework by a "fourth level" of history – the history of individual societies. This extension allows us to anchor our studies *in the present* of the society or activity system in question. It seems that the development and future of man is hidden in his history and this view leaves no room for the influencing actions of individual human beings. Undoubtedly we can wonder to what extent individuals actually make history and by what kinds of means it is done (cf. e.g. Spinosa et al. 1997).

The dominant tendencies in psychology at the times of Vygotsky and still later on were biological reductionism and mechanistic behaviourism. According to Vygotsky, biological principles cannot explain psychological phenomena beyond a certain level (Wertsch 1985, 20, 42).

The second form of reductionism that Vygotsky was striving to avoid might be termed "cultural reductionism", because it rests on the premise that human psychological processes can be explained solely on the basis of the mastery and internalization of symbolic means or sociocultural practices. Such accounts often ignore biological forces and other constraints involved in ontogenesis (Wertsch 1985, 43). On the other hand, psychology has to have a solid biological foundation (Vygotsky 1978, 1986) also in the present and future.

When dealing with the social origins of higher mental processes, Vygotsky was mainly concerned with interpsychological functioning, as reflected in his formulation of the "general genetic law of cultural development",

> Any function in the child's cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition. We may consider this position as a law in the full sense of the word, but it goes without saying that

> *internalization* (italics added) transforms the process itself and changes its structure and functions. Social relations or relations among people genetically underlie all higher functions and their relationships. (Wertsch 1981, 163 quoting Vygotsky; cf. Wertsch 1985, 60–61)

On the basis of Vygotsky's claim about the close relationship between inter- and intrapsychological forms of higher mental functioning, it might be tempting to assume that he was proposing a "transfer model of internalization", whereby the properties of social processes are simply transferred from the external, interpsychological plane to the internal, intrapsychological plane. This kind of conclusion can be avoided when taking a closer look at his statement of how internalization actually transforms the process itself and changes its structure and functions and their relationships. It seems to be reasonable to modify the traditional view about the relationship between individual and societal structures where the mechanism of individual change is rooted in society and culture – it is, but only partly. On the other hand societal change is deeply rooted in the choices of individuals and the key question is how to balance these views together (cf. Wertsch 1998; cf. also Giddens 1984).

But how should internalization be interpreted then? Internalization seems to assume a "sender" unidirectionally sending something to be internalized by the "receiver". The metaphor of internalization seems to be too strong in that it implies something that often does not happen in social reality. Hence, unidirectionality shifts to multidirectionality and to interaction or even to resonation. Instead of internalizing, the metaphor of "appropriation"[102] has been offered by James Wertsch (1998, 53). But how then should the internalization emphasized by Nonaka be appropriated or internalized by us and should the SECI model be actually a SECA model?

The Vygotskyan man seems to be more a master than a marionette[103]. In the middle of collisions between phylogenetic and ontogenetic features he can learn to master his surroundings and also himself. Prior to mastering his own behaviour, the child begins to

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[102] By appropriation Wertsch means "the process of taking something that belongs to others and making it one's own" (Wertsch 1998). Cf. Spinosa et al. 1997, 4 about the cross-appropriation and Giddens' reflexive appropriation (1990b, 304–305). This issue will be discussed in chapter 8 when focusing on the essence of social change from the Giddensian angle.

[103] Criticism against CHAT often states that although it is masterful in the social domain it does not do well at the level of the individual person (i.e. agents) (Minnis & John-Steiner 2001, 309; Davydov in Engeström, Miettinen & Punamäki eds. 1999; Hakkarainen, Palonen, Paavola & Lehtinen 2004, 151–153; but on the other hand cf. Hakkarainen et al., 250; for further information see the comparisons of CHAT and the Latourian actor-network theory (e.g. Miettinen 1999) and the role played by human and nonhuman actors). It is useful to be aware of the criticism when continuing the analysis of the key principles of CHAT.

master his surroundings with the help of tools and speech[104] - by mediational means (Wertsch 1998, 38–42). The function of the tools is to serve as the conductor of human influence on the object of activity; it is *externally* oriented; it must lead to changes in the objects. The sign, on the other hand, is a means of internal activity aimed at mastering oneself; the sign is *internally* oriented (Vygotsky 1978). In this process even children acquire the capacity to be both the subjects and objects of their own behaviour.

According to James Wertsch, most discussions on Vygotskyan mediation view it in terms of how it empowers or enables action. However, such a partial interpretation of our reality overlooks an equally inherent, although countervailing characteristic of mediational means – namely, that they constrain or limit the forms of action we undertake (Wertsch 1998; Gibson 1979). On the other hand, how we observe and see our reality is caused by our chosen terminology (Wertsch 1998, 40 quoting Burke 1966) and affects under what kind of conditions we *believe to be acting*.

But how then do these conceptual systems emerge in the first place? It seems to be reasonable to agree with Wertsch (1991, 47) that a comparison of Chapters 5 and 6 in *Thinking and Speech* (Vygotsky 1986) reveals the shift in Vygotsky's thinking about the emergence of conceptual means. In chapter 5, written in the early 1930s, concept development is treated primarily in terms of individual psychology (conceptual development from "unorganized heaps" to "complexes (including "pseudoconcepts") and to "genuine concepts"). Later in chapter 6, written in 1934, his perspective has shifted to focus on how concepts emerge in institutionally situated activity.

In institutionally situated activity, like schooling, spontaneous and scientific concepts develop at the same time – spontaneous concepts proceed from concrete to the abstract and abstract scientific concepts to the concrete level. In this process scientific concepts grow downward through spontaneous concepts and vice versa in the process of *interacting*[105] conceptual systems. The very notion of a scientific

[104] In other words the elementary functions are totally and directly determined by stimulation from the environment (a formula of orthodox behaviorism (Watson-Skinner) S-> R) but for higher mental functions the stimulations are self-generated. Self-generation means that an individual must be actively engaged in establishing a link between the stimulus and response. The needed intermediate link is a second order stimulus (sign) drawn into the operation as a mediational means. The situation of the individual is "far-from-static" due to the fact that he is simultaneously both directly and indirectly interacting with the reality and while doing so constantly synthesizing these sources. (cf. Cole & Engeström 1993, 6-7)

[105] Vygotsky believed (1986, 157; cf. Engeström 1999a, 398-399; Hakkarainen et al., 269) that the two processes – the development of spontaneous and nonspontaneous (e.g. scientific concepts) concepts – are related and constantly influence each other. Based on this line of thinking Engeström (2000c, 2001a) has constructed a complementary perspective, namely that of horizontal or sideways development of concepts. Cf. Tuomi (1999, 142-148) for additional interpretation of Vygotskyan angle to the development of concepts (i.e. the development of conceptual thinking).

concept implies a certain position in relation to other concepts, i.e., a place within a system of concepts. (Vygotsky 1986, 172, 192–194, 197)

During this developmental process the child (the learner) does not just receive readymade scientific concepts for future purposes, but when the system of scientific concepts is evolving, the way in which reality is generalized and reflected in everyday situations changes at the same time. (Vygotsky 1986, 212–213, 217)

What did Vygotsky mean by this development level? Wertsch (1985) has argued Vygotsky's position so that development cannot be reduced to learning by instruction, although it seems to be most compatible with his comments about the emergence of intrapsychological from interpsychological functioning. In principle he understood that learning and development are interrelated (Vygotsky 1978) and that instruction must be oriented toward the future, not to the past (Vygotsky 1986; Engeström 1987); not toward the actual but toward the potential level of competence[106].

There can be little doubt that, at least in the English-speaking world (and also globally; by the researcher's personal experiences), it is the *zone of proximal development* that has been Vygotsky's most important legacy to education (Bransford, Brown & Cocking eds. 2000, 80; Wells 1999, 313). It has widely inspired educational researchers inside the cultural-historical tradition (e.g. Engeström 1987; Tuomi-Gröhn & Engeström eds. 2003; Wertsch 1985; Lave & Wenger 1991; Wenger 1998) but outside it as well (cf. reciprocal teaching by Palincsar & Brown 1984; Brown & Palincsar 1989; Brown & Campione 1996; progressive problem solving by Bereiter & Scardamalia 1993; Bereiter 2002 and progressive inquiry by Hakkarainen et al. 2004).

Vygotsky's general claim about the social origins of higher mental functioning in the individual surfaces most clearly in connection with the zone of proximal development. Vygotsky defined it as the "distance between the actual developmental level as determined by independent 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, 86).

The main question to be answered, based on Vygotsky's line of thinking, is not "how the child (or an adult) came to be what he is". The main question is "what he not yet is" (Wertsch 1985) and how we could consciously enable this transition from present actual to future

[106] Sutter (2002) makes a distinction between "learning the given new" (orientation to the past) and "learning the societal new" (orientation to the future). Hence, learning as an activity has to been seen as oriented at two directions (cf. also Hakkarainen, Palonen, Paavola & Lehtinen, 2004).

potentials to happen? But even more intriguingly we have to ask: "Who are those "more capable peers" in our global society?[107]

Vygotsky's sentence "it is only in movement that a body shows what it is" (Vygotsky 1978) describes well also the development of his concept of zone of proximal development. Unfortunately Vygotsky did not live long enough to work out what his concept would really mean to educational practice and what his theory really is. His early death may be the cause of his failure to deal with broader sociocultural issues and avoid the dangers of individualistic psychological reductionism so often characterizing contemporary psychology (Wertsch 1985, 1991).

Extending the concept of zone of proximal development has received vastly differing interpretations, varying along the dimension of individual reductionism (e.g. scaffolding, Lave & Wenger 1991; cf. Brown & Palincsar 1989, 411; reciprocal teaching, Palincsar & Brown 1984; progressive problem solving, Bereiter & Scardamalia 1993; Bereiter 2002) and of its socioculturally extended versions[108].

In an individualistic direction the main issue seems to be the reciprocal relationship between a teacher and a student where the student internalizes the aid or scaffolding to be used in later situations (cf. Brown & Palincsar 1989; Lave & Wenger 1991). It is highly questionable what could be actually internalized or whether we have to shift our view about consciousness (distributed or non-distributed?) and its environment (in a "vacuum" or contextually embedded?).

Should we then abandon these "individualistic" examinations? No, because also these theories are under continuous development (movement) and it is useful to scrutinize what they really are. The ongoing activity can be seen either from the perspective of the individual participants acting with mediational means, or from that of the social practices in which they and the mediational means are involded (Wertsch, Rio & Alvarez 1995; Wells 1999). Here again the key seems to be "living in the middle" (Wertsch 1998), and the concept of zone of proximal development enables us to blend these perspectives together. In this blending *all aspects of the learner* have to be kept in mind.

Vygotsky himself referred to these aspects by emphasizing the affective and volitional tendency behind thought. Only by analyzing

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[107] According to Wenger (1998, 162) identity in practice is always an interplay between the local and the global.

[108] Engeström (1987, 174) proposes an extension of the concept of the zone of proximal development as the distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in everyday actions.

these aspects can we find the answer to the final "why" in the analysis of thinking (Vygotsky 1986). Behind every thought there is an affective-volitional tendency, which holds the answer to the last "why" in the analysis of thinking (Vygotsky 1986, 252). Mahn and John-Steiner (2002) remind us of this largely unknown aspect, but nevertheless a central one, of Vygotsky's research. According to them this emotional aspect includes the gift of confidence, the sharing of risks in the presentation of new ideas, constructive criticism and the creation of a safety zone (Mahn & John-Steiner 2002; Wells 1999). When a breach in this complementarity occurs because the cognitive demands are too far beyond the learner's ability, or because negative affective factors such as fear or anxiety are present, the zone in which effective teaching/learning occurs is diminished (Mahn & John-Steiner 2002, 49).

The concept of zone of proximal development applies potentially to all participants, and not simply to the less skilful or knowledgeable (i.e. not only to a child but potentially to a teacher). Because learning is a life-long process for us all, it could be assisted by others, including those who are younger, less mature or novices (Wells 1999; Tuomi-Gröhn & Engeström eds. 2003; Hakkarainen et al. 2004; Lave & Wenger 1991; Wenger 1998).

The zone of proximal development is created in the interaction between participants as they engage in a particular activity together. The interaction is not limited to human participants who are physically present in the situation. The contributions of "absent" participants are recalled from memory or encountered in artefacts functioning as more capable peers in the zone of proximal development. Interestingly, development does not seem to have any predetermined end; although it is characterized by the increasing complexity of organization, this does not, in itself, constitute progress. What is considered to be progress depends on the dominant *values*[109] in particular times (Wells 1999, 333).

The zone in question implies that firstly the level of actual, secondly the level of *potentials,* and thirdly collectively generated solutions to the experienced contradictive situation have to be kept in mind. To organizations this means overcoming three "impossibilities" – uncovering the actual (not just espoused but those in use or authentic ones), widening the scope of possible solutions in an organizational context, handling the organizational constrains as effectively as possible, and probing into the potentials of the future. Interestingly, rather often someone's actual is someone else's potential and the main

[109] We have different kinds of values ranging from espoused values, to authentic values and even to relatively stable "global values" or hypernorms (cf. chapter 2).

question seems to be whether progressive inquiries are allowed and made possible for the organization in question.

4.4.2. Man as a social being: Leont'evian and Engeströmian expansions

Another angle to understanding how man does not act in a vacuum but is social in his origins and fully "embedded" in his environment starts to emerge with the assistance of Alexei Leont'ev. Before entering into his analysis, an example presented by Gregory Bateson, often used on the field of CHAT, needs to be introduced:

> Suppose I am a blind man, and I use a stick. I go tap, tap, tap. Where do I start? Is my mental system bounded at the hand of the stick? Is it bounded by my skin? Does it start halfway up the stick? Does it start at the tip of the stick? (Bateson 1972, 459; cf. Cole & Engeström 1993; Cole 1995; Wertsch 1991; Ingold 2000)[110]

Michael Cole (1995, 110) elaborates Bateson's idea by arguing that one seems to be committed to include in one's analysis not only the man and his stick but also his *purposes* and the *environment* in which he finds himself. When the man sits down to eat his lunch, the stick's relation to the mind has totally changed, and it is forks and knives that become relevant. The relevant order of context for analysis will depend crucially on the tools through which one interacts with the world, and these in turn depend upon one's goals and other *local cultural constraints and enablers* of action.

In his famous example of "primeval collective hunt" Alexei Leont'ev explicated the crucial difference between an individual *action* and a collective *activity* as follows:

> When a member of a group performs his labour activity he also does it to satisfy one of his *needs.* A beater, for example, taking part in a primeval collective hunt, was stimulated by a need for food or, perhaps, a need for clothing, which the skin of the dead animal would meet for him. At what, however, was his activity directly aimed? It may have been directed, for example, at frightening a herd of animals and sending them toward other hunters, hiding in ambush. That, properly speaking, is what should

[110] According to Hubert Dreyfus (1972: 1999) Heidegger, Merleau-Ponty, and Michael Polanyi have each devoted a great deal of thought to this very same question. Dreyfus quotes Polanyi (1958) as follows: "While we rely on a tool or a probe, these are not handled as external objects.. they remain on our side.. forming part of ourselves, the operating persons. We pour ourselves out into them and assimilate them as parts of our existence. We accept them existentially by dwelling in them."

be the result of the activity of this man. And the activity of this individual member of the hunt ends with that. The rest is completed by the other members. What the processes of his activity were directed to (*the object;* added by the researcher) did not, consequently, coincide with what stimulated them, i.e. did not coincide with the *motive* of his activity; the two were divided from one another in this instance. Processes, the object and motive of which do not coincide with one another, we shall call "*actions*". We can say, for example, that the beater's activity is the hunt, and the frightening of game his action." (Leont'ev 1981, 210; cf. Engeström 1987)

The key to understanding activity systems is their object-orientedness as described by Leont'ev,

> The main thing that distinguishes one activity from another is the difference of their objects. It is exactly the object of an activity that gives it a determined direction. According to the terminology I have proposed, the object of an activity is its true motive. It is understood that the motive may be either *material* or *ideal*, either present in perception or existing only in imagination or in thought. (1978, 62; italics added)

So the object is both something given (a thing out there) and something projected or anticipated. This very duality of the meaning of the term indicates that the concept of object carries in it the processual, temporal, and historical nature of all objects. Objects are objects by virtue of being constructed in time by human subjects (Engeström 1990, 107; Miettinen 1998b, 424). Object construction could be seen as a complex and continuous process where initially unreflected, situationally given "raw material" is collectively construed as meaningful and shared by the participants of the activity system (Engeström 2001a, 136). In this sense, the object determines the horizon of possible goals and actions. But it is truly a horizon: as soon as an intermediate goal is reached, the object escapes and must be reconstructed by means of new intermediate goals and actions (Engestöm 1999c, 65).

Because the object directs the activity system, the transformation of the object has fundamental consequences for the whole system. Hence, not always does the object work unconsciously "behind their backs" of for example Leont'ev's ancient hunters (Sutter 2002, 28); on the contrary it is a moving target and also consciously under transformation "in front of our eyes".

Activity is analyzed at three levels because activities are distinguished on the basis of their motives and the object toward which they are oriented; actions, on the basis of their goals; and operations, on the basis of the conditions under which they are carried out (Wertsch 1981, 1985; Leont'ev 1978; Engeström 1987). The object of an activity is its true motive, and under the conditions of division of labour the individual can participate in activities without being fully conscious of their objects and motives. The total activity seems to control the individual, instead of the individual controlling the activity.

The opposite is also possible because actions may develop into an activity:

> These are the ordinary cases when a person undertakes to perform some actions under the influence of a certain motive, and then performs them for their own sake because the motive seems to been displaced to their objective. And that means that the actions are transformed into activity. (Leont'ev 1981, 238)

The transformation does not happen automatically or unconsciously but needs an act of reflecting and a special activity for these purposes – *a learning activity* (Engeström 1987, 68).

According to Leont'ev (1981) it is obvious that the beater's action at a hunt is possible only on condition of his reflecting the link between the expected result of the action performed by him and the end result of the hunt as a whole. Actually the relation that connects the individual's expected results with the outcome of the collective activity needs to be subjectively reflected. If then the object directs the activity system, what kind of role does the transformed outcome play? It could be said that the activity system is partly guided by the outcome; for example if hunting becomes prohibited and deer must be preserved.

If then a demanding object makes the members of the tribe to divide the labor (Engeström 1999d), could it be possible that depending on the intended outcome various kinds of expertise and experts are needed? Depending for example whether one is hunting or preserving the deer? As Berthel Sutter (2002, 258) puts the Leont'evian idea: "There is no activity without an object, and there is no object without activity." But although there could be activities without the outcome being in the minds of individual participants, the outcome could be an intended one eagerly striven for and in a way guiding individual participants. Consequently, the correct formula seems to be: activity/ object-> outcome (cf. Sutter 2002, 248; cf. also Engeström 1996).

At this phase CHAT seems to need a tool or a theoretical framework within which social institutional, interpsychological and

intrapsychological levels of analysis can be linked, but not reduced to one another, so that questions about the relationship between activity settings and the individual can be answered. By this tool the subjects who are participating in the activity system in question could identify the "hidden forces" influencing their performance (cf. Wertsch 1985, 215-216)[111]. To meet these kinds of individual needs exactly, Yrjö Engeström has developed such an activity system (1987), shown in **figure 4.4**.

Among the researchers of CHAT the contradictions are seen to have a central role as a source for learning and development. Yrjö Engeström (1987, 87-89) has conceptualised them as follows. The primary contradiction of activities lives as the inner contradiction between exchange value and use value within each corner of the triangle of activity. The secondary contradictions are those appearing between the corners. The tertiary contradictions come into being between culturally more advanced and less advanced forms. The quaternary contradictions require that we take into consideration the essential neighbor activities and their elements.

Leont'ev has given a clarifying example of this primary contradiction as follows:

> The doctor who buys a practice in some little provincial place may be very seriously trying to reduce his fellow citizens' suffering from illness (use value), and may see his calling in just that. He must, however, want the number of the sick to increase (exchange value), because his life and practical opportunity to follow his calling depend on that. (Leont'ev 1981, 255; cf. Engeström 1987, 85-86; 2000b)

The activity system as a context of actions of individuals does not determine these actions, but much depends on the properties of the agents. In a way the agents can actively participate in the process of making their future (Engeström 1987; Wertsch 1991, 1998) and they should not be overemphasizing the exchange value. People have to decide where they want to go, which way is up; or which way is the ethically sound decision on the societal or even on the global level?

But to what extent can individuals actually initiate and control current local and global changes? To what extent are they controlled by the outer socio-economic structures? It may be true that many of the current changes are manifestations of activities from below and

[111] Interestingly, Wertsch does not personally synthesize the needed unit of analysis, focusing instead on the mediated action in their contexts (Wertsch 1985, 1991, 1998).

not just outcomes of traditional maneuvering among the elite of political decision-makers (Engeström 1999b; cf. e.g. Spinosa et al. 1997; Engeström, 2004a) – but many seem not. On the other hand these changes are often unexpected or at least very sudden and rapidly escalating. Occasionally they seem to be individually and collectively planned and expected at least to some extent, but how about then in the case of the FNDC?

Chapter Five
THE DEVELOPMENT LABORATORY METHOD AT THE FNDC

5.1. The idea of the use of the Change Laboratory method at the FDF

Since 2000 the researcher has served at the FNDC, first as a planning officer[112] in the headquarters and since September 2004 in the Department of Education. The researcher has been involved in two planning processes aiming at developing Finnish officer education (the first one in 2000–2001 and the second one from 2003 onwards) and lately more precisely in the development of on-the-job training (education) of military teachers[113]. During the years the researcher has established wide personal relationships inside the FNDC and FDF. These formal and informal networks have allowed the researcher to gain a relatively deep understanding and personal experience of the case to be studied (i.e. the FNDC). At the same time the researcher has learned to be an "insider" at the FNDC, being in a way *a participatory observer* and later a *developmental-interventionist* (Engeström 2000a, 2000b; Virkkunen 2004; Miettinen 2004).

Already in 2000 the researcher got an idea that the Change Laboratory® method could be applicable also in military organizations. The idea was to apply the method to a chosen brigade and its Management Group. But thinking retrospectively, the idea popped up too early and the researcher needed some time to prepare himself for the demanding use of the method.

In 2001–2002 the researcher participated in a Blended Learning Course arranged at the FNDC, producing a development plan for a new kind of course – a Military Teacher Education Course[114]. The first Military Teacher Education Course was arranged in 2003. At the same

[112] At that time the researcher was also a part-time teacher at the FNDC.
[113] In April 2004 the Administrative Director of the FNDC gave an order (R2061/5.1/D/III/20.4.2004) about planning groups for the Bologna process. Officially the group in question was called "opetuksen laatu" or "the quality of teaching". In the course of time the focus of the group shifted from "quality" to the development of the teachers.
[114] During the process the researcher made also a draft for a Teacher's Self-Evaluation Sheet, which is presented in the analysis of the Development Laboratory meetings (i.e. in chapter 6).

time the researcher participated in a group giving guidelines for "good" teaching at the FNDC, service schools and service branch schools under the supervision of the FNDC. Also some pedagogical seminars for the development of teaching were arranged, but despite of these efforts *it was felt* that something more fundamental and transformational was needed.

5.2. Developing the idea of possible Change Laboratory meetings

In 2002–2003 the researcher studied in Japan at the Japan Advanced Institute of Science and Technology (JAIST). The period gave the researcher excellent possibilities to study the appropriate theories, to get tacit knowledge from all kinds of scientists and social scientists and to get an "outsider" perspective to the FDF and the FNDC. Consequently, the researcher learned how to "switch" between the perspectives of the "insider" and "outsider" at the FDF.

During the summer after returning back to the FNDC the researcher made a memorandum for the Administrative Director of the FNDC about the Bologna-process[115]. The memorandum contained a proposal to arrange ten Change Laboratory meetings, but obviously the timing was not right and it was too early to arrange such meetings. The "window of opportunity" was not open and different kinds of interests remained to be identified and notified.

On the other hand, in 2003–2004 the researcher supervised a research done at the Senior Staff Officer Course. The title of the research was: "The activity system of the military unit and its inner contradictions – basis for further studies"[116]. The supervision process allowed the researcher to deepen his understanding of the theories of the cultural-historical activity theory. In September 2003 the researcher wrote an article to the Defensor patriae (the official journal of the FNDC), explaining in Finnish the basics of the activity system idea. No further inquiries or discussions emerged and the "window" remained closed. Paradoxically, in autumn of 2004 the Change Laboratory education was included in the instruction of Cadet Courses.

During the year 2004 the winds changed and the "window" started to open slowly, partly because of deliberate efforts of the researcher. In January the researcher arranged for the Management Group of

[115] The memorandum was dated 7th July 2003.

[116] During the years another activity theoretical research has been done at the FNDC (by major Mikko Lappalainen (1999; an unpublished Master's Thesis of the General Staff Officers' Course)). See also Fransson (2001); Johnsson (2001), from the Swedish Armed Forces.

the FNDC an opportunity to *anonymously* give feedback with the Response®-system and consequently influence how the research will proceed. Since then the researcher has been aware of wide informal and formal expectations shared by the Management Group of the research-based development of the FNDC.

In 2004 the researcher gave several presentations and made minor interventions[117] about current pedagogical issues in the Bologna planning process of the FNDC. During this period also the planners participating in the Bologna process were invited to discuss and plan in the FDF Training Portal, and therefore an additional source of data seemed to be available[118].

In April 2004 the Administrative Director of the FNDC gave an order[119] about planning groups for the Bologna process. The researcher belonged to the group of teaching development. The group arranged two formal meetings and the researcher was nominated as the formal leader by the official leader of the planning group. In October the group submitted a memorandum, again containing the idea of Change Laboratory meetings. On 2nd November 2004 the Commandant of the FNDC gave the researcher an official permission to arrange about ten Change Laboratory meetings[120] and thematic interviews. The commandant also decided that the researcher is officially the leader of the group of teaching development.

In the period from November 2004 to February 2005 five development meetings were arranged at the FNDC with representatives of the departments of the FNDC. The research data consists of five videotaped two-hour laboratory meetings. All departments were represented only at the first meeting and the participants kept changing. After each meeting the researcher made a memorandum that was sent to all participants, to those invited and to the Administrative Director, to the Chiefs of the Degree Divisions and to the Chiefs of the Departments. All the videotaped data was transcribed from June to July 2005 by a research assistant. The researcher checked the transcription especially in major turning

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[117] The presentations (interventions) in a chronological order are: 24th February "Comparing Science and Normal Work"; 24th May "About the Development of Teaching"; 26th May "The Basics of the Core Curriculum Analysis"; 18th August "The Development of the College as a Research Object". 18th October the researcher invited an officer from the Finnish Air Forces to talk about the experiences gained from "The Military Educational Innovation".

[118] The gained experiences will be reflected on in chapter 7.

[119] Planning groups for the Bologna process.

[120] The idea is to arrange "on the shop floor" a room or space in which there is a rich set of instruments for analyzing disturbances and for constructing new models for the work practice (Engeström, Virkkunen, Helle, Pihlaja & Poikela 1996, 291; cf. Virkkunen, Engeström, Pihlaja & Helle, 2001; cf. in a school context Engeström, Engeström & Suntio 2002). See the following chapter 6 for the idea of "change laboratory meetings" turning to "development laboratory meetings".

points[121] identified already during and right after the meetings. During the transcription process no new turning points were identified. The transcription conventions are listed in **Table 5.1**.

Table 5.1 Transcription conventions

Convention	Meaning
[word]	researcher's comments added
word.. or …word	turn or sentence remains unfinished or turn continues from the same speaker's previous turn (the exact meaning varies case by case)
(//)	whole sentences are cut out
(word) or (-)	unclear word
word	word(s) with special emphasis
##	overlapping speech

After two Development Laboratory meetings, in December 2004, the researcher gave a presentation of these issues at the Joint Services Command and Staff College in the United Kingdom. The title was: "Military Education in the Age of the Bologna Process"[122]. The intent was and is to produce social scientific knowledge to be used while developing European military educational systems.

After five Development Laboratory meetings the researcher decided that also other sources of data were needed. In order to get familiar with the interests and "angles" of the managers of the FNDC the researcher decided to conduct thematic interviews with the senior officers and professors of the FNDC.

Semi-structured thematic interviews were conducted with the chosen senior officers and professors of the FNDC[123]. The thematic interviews, each lasting between one and a half to three hours, were carried out from March through April 2005. The interviews were structured around the questions presented in **appendix 1**. During

[121] A turning point stands for new insights and perspectives appearing in the discussion and, consequently, changing the course of the discussion (Toiviainen 2003, 74; Engeström & Escalante 1996: 2005; Kärkkäinen 1995).

[122] An article based on the presentation has been published in the "Science and Weapon" (2005).

[123] The interviews were conducted with the Commandant, the Administrative Director, the Chiefs of the three Degree Divisions and the six Departments and the Professors (excluding the professor of Military History due to practical difficulties in finding an appropriate time for the interview). Therefore, the perspective of the Department of Military History was expressed solely by the Chief of the Department.

the interviews some new questions and topics emerged to be discussed. Field notes were done during the thematic interviews.

The analysis of the gathered data started during the thematic interviews by writing the emerging concepts down in the margins of the field notes. The constant comparative method of grounded theory was used in comparing the data, especially from the same individuals with themselves at different points in time, comparing different people, (the official view of the FNDC (the Commandant and the Administrative Director and the other views) while looking for similarities and differences, the views of the Degree Divisions and the views of the different Departments; cf. previously mentioned "angles") and comparing an incident in the data to one recalled from experience or from theoretical research already done[124]. (cf. Charmaz 2000, 515-519; Glaser & Strauss 1967; Strauss & Corbin 1998)

While comparing the data the researcher started to code it. In the beginning he perused the entire individual interview while typing a memo of each. Then he focused on each question at a time, writing another memo. Finally before writing a third memo of the thematic interviews he counted *the themes* in the individual answers given to the questions, checking the unbroken chain between the data and the conclusions made of them.

The main purpose of the comparison and coding was to get sensitized to the properties and *dimensions* in the data. For example the question about the meaning of learning was asked: "What is the meaning of "learning"? (*Mitä mielestäsi merkitsee "oppiminen"?*). The answers of the respondents contained different kinds of properties varying dimensionally.

The thematic interviews were a great learning experience also to the researcher[125]. During each interview the researcher made several decisions about the issues to be focused on in order to fill the identified gaps in the data and holes in the used theories. The researcher went back to the archives and studied more, trying to understand the present situation of the FNDC, aiming at helping the college to develop its teaching and to participate in the theoretical debate in the field of organizational learning and knowledge management. In the next chapter the meetings will be analyzed.

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[124] Cf. chapter 4 how spontaneous and scientific concepts can interact with each other, and as in this case, can enable the researcher to adapt to the situation while making sense of the social reality in question.

[125] It is unclear how the interviewees experienced the interviews and what kind of influences were caused by the interviews, but there is no reason to doubt that the interviews had fruitful consequences at the FNDC. Consequently, we could assume that the double hermeneutic process at the FNDC has had some intended and unintended consequences remaining to be identified in the future.

Chapter Six
DEVELOPMENT LABORATORY MEETINGS AT THE FNDC

6.1. Before the first meeting

On the 2nd of November 2004 the researcher got an official permission from the Commandant of the FNDC to arrange not more than ten Change Laboratory meetings and some thematic interviews. The risks of such a project were explicitly discussed with the Commandant and the Administrative Director of the FNDC. The researcher promised to take the full responsibility of the overall success of the meeting process.

A representative from each department of the FNDC had to be invited to the meetings and so the researcher contacted each Chief of Department. On the basis of these contacts the researcher received some illustrative answers from some departments. Excerpts of these are quoted here in order to get a basic picture of the overall situation at that time.

Excerpt 6.1 (5th of November)

The Department of .. has not reserved any annual work unit [or some portion of it] for the research in question and all the teachers have been allotted their duties for the next year in a detailed manner. We do not have any resources to participate in this project... I will personally participate in the first meeting and will decide how our department will proceed in this project in the future.

Excerpt 6.2 (5th of November)

From our Department, X [a named teacher] will participate in the meetings at least for a start. Personally [the head teacher of the department] I do not have time for such meetings because of my teaching duties and the main Bologna process.

The main process of the Bologna educational planning was identified to exclude the present process aiming to develop teaching in the FNDC. Obviously the fact that the Commandant of the FNDC had allowed the project, and by doing this had "ordered" to arrange such meetings with the representatives of each department, seemed to be unclear.

6.2. The first meeting

The first meeting was arranged on the 10th November 2004. Representatives of all departments were present. For a start the researcher gave an explanation of the historical roots of the Change Laboratory meetings. The researcher emphasized that it was an official project accepted by the Commandant and the intent was to go "deeper" than already done (cf. chapter 5 of the main attempts to develop teaching in the FNDC during the present research project).

The researcher told about the meaningful difference between change and development. According to dictionaries (e.g. Longman Dictionary of Contemporary English 2001) "change means to become different" and on the other hand "development is the gradual growth of something, so that it becomes bigger or more *advanced".* Hence, the word development seemed to describe better than the word change the overall intent of the researcher and the meetings were renamed Development Laboratory meetings.

The researcher emphasized, in a slightly simplified manner, that the main aim was to *identify A* (the present state of the teaching practices at the FNDC) *and B* (a visionary end state where we want to *develop* our teaching practices). *Also C* (how to fill the gap between A and B) was a fundamental question to deal with and also to be answered in a practical manner. *No theories were introduced to the participants and the discussion was intended to be as practical as possible.*

After the welcoming words of the researcher participant D expressed his initial point of view by saying:

Excerpt 6.3

When focusing on the essence of teaching we have to ask what it really is. Obviously it is *the transmission* of culture from the older generation to the younger generation. From my point of view the question about what will be transmitted and where it will be transmitted from is the most essential question to answer… Consequently, the question of how the teacher arranges his transmission duties in practice is a completely secondary issue..

From my point of view these kinds of [developmental] activities are *useless*.

Participant B was hesitant to accept the above mentioned and commented,

Excerpt 6.4

So, not actually exactly to your point, although you begun rather provocatively...if you cannot teach at all then it does not matter even a little bit if you personally know how to do it but cannot make the students to learn it..

After two turns teacher F expressed his *wider focus on the object* in the question by saying,

Excerpt 6.5

Now we are talking just about the individual teacher and how he feels about this kind of work and way of working..but we should be talking about..the methods to help an individual teacher towards some new kind of direction and right for a start it becomes obvious that *we do not have any organization whose responsibility* is to bring new [pedagogical] ideas to our college on a daily basis.

Interestingly the object of the discussion shifted from the individual teacher to the FNDC as an organization. Noticeably the Department of the Education at the FNDC was not considered as such a "supporting" organization and *potentially* having expertise on such pedagogical issues. But the object kept expanding even during the very same episode when teacher F continued:

Excerpt 6.5 continues:

Our problem from my point of view is the fact that we keep saying how knowledge could be found from the military units. In practice this saying means that it cannot be found anywhere and we keep going according to our subjective views.

This statement meant that the object shifted to include both the FNDC and its environment [the military units].

Even this was not enough for teacher F and he widened his and our perspective by continuing,

Excerpt 6.5 continues:

> How about then this guidance [of our teaching practices]; if we again start with the fact that the field guides us and the requirements expressed by the field guide us..but is it not our duty to see, not necessarily "beyond" but having a little bit *"wider" point of view* than just the perspective of the military units?

Teacher H took an initiative and started to explain his view to the mentioned wider point of view by recollecting his experiences at the FNDC,

Excerpt 6.6

> After coming back to the FNDC [after serving many years in the military units] and knowing how this organization has changed I have recognized how the research and developmental activities of the FNDC have proceeded..when I personally wonder how it could be possible to develop our teaching practices, the idea about *developing research* to focus on such issues to be concretely applicable in our teaching and to give some justification and backing to our teachers is needed.

When this wider view had been reached, teacher A explained his systematic view by emphasizing that it is not enough to be aware of the box (the FNDC) having its outer relationships (with the environment; with the military units) but we have to look inside the box because,

Excerpt 6.7

> Then another clear feature [the first one emphasized by him was the heterogenic student population] of us are those different kinds of subsystems as student feedback systems, peer evaluation systems, leader evaluation systems and systems like these and the fact that *these good subsystems do not often make a good system as a whole* but serve ourselves in a contradictory manner...

In other words teacher A brought up the issue of *alignment* and in this case especially *misalignment* when he spoke about misaligned subsystems. When the discussion reached the level of subsystems and systems, hesitation appeared on the scene. Teacher B expressed a rather widely shared view as follows:

Excerpt 6.8

> But discussing the change and development of our objectives brings to my mind an idea that there could be such an issue that we cannot guide and affect.

The dimension between possible and impossible emerged during the very first meeting, but why? Could it really be so that the chosen teachers did not have or could not have any influence on the FNDC as a whole? After the meeting the researcher made a memorandum and sent it to the participants and to the Administrative Director, to the Chiefs of Degree Divisions and to the Chiefs of Departments. This routine was repeated after each meeting.

6.3. The second meeting

The second meeting was arranged a week after the first one (on 16th November). At this phase not all departments were represented[126] and there were two new participants. Consequently two new phenomena emerged on the table of the group: haste and the question of priorities.

An example of the haste was already given in excerpt 6.2 when a teacher explained his paradoxical situation by explaining his priorities so that normal teaching is more important than its development. The situation is like in the saying where "the person is so busy that he cannot even say "a cat", (and in this case has enough time to say "a ca"; notice the missing letter "t").

It is interesting to notice how this kind of perspective does not take into consideration the normal routines of making some preparations (i.e. developing) for the next course or teaching session. Teaching seems to be a routine executed in a habitualized manner and it seems to be "teaching without preparations". In the midst of

[126] One representative was making a paper (based on paper made by the Centre for Educational Assessment; see chapter 7) for the Chief of Personnel of the FDF to be presented on the 19th November.

the busy situation the individual teacher may not be fully aware of the main point: the main thing should be how well the students are learning, not how much the teachers are teaching.

For a start the researcher emphasized that the aim is to develop our teaching practices by identifying some effective methods for societal guidance. During the first meeting this kind of question emerged and the participants were hesitant with it: is it possible and especially is it possible for us at the FNDC? Teacher E explained this difficulty as,

Excerpt 6.9

> Especially in our project, but also in all kinds of activities aiming at developing learning, the basic problem and challenge is the question about the levels. Personally I could identify three possible levels: on the first level there are individual teachers, on the second level there is the system [the FNDC] and on the third level there is an outer level (the FDF or the outer area of operations). The main problem is to choose the proper level, and complete unification of the three levels is not a easy task... Personally I prefer choosing one of these three levels to focus on.

In his comment the researcher explained his point of view by saying that the main question is not necessarily which one of the levels to choose but to identify those intertwined levels and act actively on several levels. The researcher introduced the key principles of the cultural-historical activity theory (see 4.4) to the participants when the shared attention of the group had shifted towards the question about the levels. The researcher gave each participant a copy of the draft analysis of the FNDC made by him (**figure 6.1):**

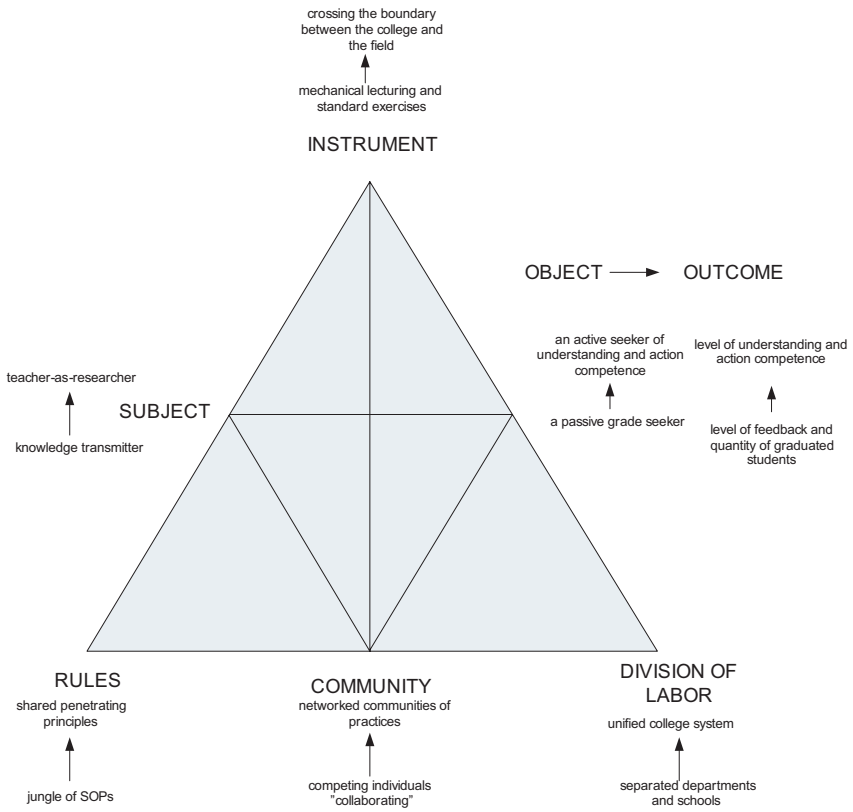

Figure 6.1 A draft analysis of the FNDC.

The analysis shows how each corner of the activity system of the FNDC seems to need developmental actions *potentially* "lifted" to the qualitatively higher levels. But how well aligned with the basic assumptions and beliefs of the participating teachers will the analysis be?

The introduction of the CHAT theories caused teacher F to give a comment,

Excerpt 6.10

Here we have a problem when we start to discuss about time because this model [the activity system model based theories of CHAT] does not really see the present time as such as we should understand it by making our present activities dependent of the past..because the past times are such an essential part of ourselves and we cannot take distance out of being able to understand what is our present state… the one problem with this kind of way of looking at things [represented by CHAT] has been the fact that it in

a way pushes the understanding from the past but in what phase we are going to draw a line between the past and the present? If we cannot draw such a line we cannot understand our present state and consequently not our future.

When looking with the perspective of CHAT, history could help us uncover the contradictions and potentials of an activity system, but it does not tell us how those contradictions are to be resolved (Engeström 2004c, 156).

Teacher F tried to look "behind" ourselves and inside our culture ("where we stand") by explaining the key feature of the current teaching practices at the FNDC,

Excerpt 6.11

In our institution some kind of repetition has been canonized and due to this fact it will be difficult to achieve renewal [in the FNDC].

Teacher B wanted to emphasize the main point of our current teaching practices,

Excerpt 6.12

Critical evaluation of your own teaching is a nasty business to do…do [our teaching practices] they really represent teaching or indoctrination?[127]

Teacher I seemed to agree strongly with teacher B by saying,

Excerpt 6.13

..the guidance for the teaching is arranged in a very scattered manner, or more precisely put, it is practically non-existent, or if there is such guidance it happens within teacher groups.

At this phase a very intriguing question emerged: If the current state of the teaching practices needs to be scrutinized at the FNDC, how willing are we to do it? With the words of teacher F [cf. excerpt 6.10] are we ready to "draw a line" between the past and the present for the sake of the future? Are we ready to overcome the cultural barriers currently identifiable at the FNDC?

[127] He expressed his view based on Tapio Puolimatka's views (see Puolimatka (1997) Teaching or Indoctrination: Power and Manipulation in Teaching, Helsinki: Kirjayhtymä), which is not included in the references due to the fact that the researcher has not read the book, although he knows that teacher B has.

An episode picked up from the first and second meetings seems to be clarifying at this phase. A younger teacher J, having kept his opinions about potential problems by himself during the first meeting[128] took an initiative in the second meeting by saying,

Excerpt 6.14

..personally I have a such a feeling that we are teaching ..[in our discipline]..at least on the first degree level [in the cadet courses] examples and models or lists and then if we take something out of the totality, one example or a model, and put him [the individual learner] to a little bit different [situation] where one has to put it in practice and think then we will go to the *grey area..*

Obviously teacher J feels that the stated issue shows a potential problem area for the department and maybe even for other departments, but being curious about the further actions concerning the potential problem the researcher asked: "Have you discussed the observation with someone?"

Teacher J responded,

Excerpt 6.15

As a matter of fact we have discussed the observations after I recognized that it was connected to my personal objectives [as a student in a pedagogical master's program] to develop our practices and so within our teaching group actually we discussed these observations and immediately the question concerning our tests arose: "What kind of know-how are our tests actually assessing; some kind of [disciplinary] know-how or something else?"

The researcher asked about discussions within the whole department and the teacher answered,

Excerpt 6.15 Continues

Not yet, but I do not know whether someone else has discussed it; but I think that he [the Chief of Department] will ask about what kinds of thoughts have emerged here because he [the Chief of Department] gave me this task [ordered me to participate in the group].

[128] The reasons for "not-voicing" potential problems may have been caused by the presence of the older colleague of the same department and due to the "face saving" needs of the younger officer.

The excerpts interestingly show some cultural barriers influencing the way the department is moving along the dimension of organizational silence and open communication. The phenomenon came up also during later meetings, as will be seen when diving deeper into the present culture at the FNDC.

6.4. The third meeting

The third meeting was arranged on the 12th of January 2005, and also one of the Chiefs of the Departments was present. The principles of CHAT were explained to the participants during the second meeting. Consequently in this phase it seemed to be appropriate to use the activity system model as the "glasses" to separate fundamental questions from secondary ones.

During the second meeting the issue of levels was already discussed in the group. Is the main duty of the group to choose the appropriate level for further discussions and developmental activities or is it even better not to stick to a single level but act on multiple levels at the same time instead? In the second meeting the researcher explained how he feels that instead of reducing the analysis on a single level (i.e. to the level of an individual teacher), there is a strong need to conduct the research simultaneously on multiple levels.

In the third meeting this view was challenged by teacher F when he said,

Excerpt 6.16

> ..do I need to focus on something [i.e. on rules, teachers, tools, object] and emphasize something instead of thinking that everything is going to be developed and consequently nothing will be developed at all?

This expression did not take into consideration the fact that since the introduction of the principles of CHAT the researcher has been stressing especially the fundamental systemic questions instead of secondary ones. In practical words this means focusing for example on "the outcome" and "the object" of the FNDC. But someway these "systemic cornerstones" were not enough for the group, and teacher B put the idea in the form of the question,

Excerpt 6.17

How do you see those values as guiding our activities? Where do you put these values on the activity system model?

The researcher explained that values could be seen as akin to rules. The centrality and the essentiality of the values were explained by the teacher I as follows:

Excerpt 6.18

..without values, enduring values, in a way without such energizing values this organization will not even sustain its vitality.

Paradoxically when the importance and the significance of the values was recognized it was also felt that it was not the duty of our group to focus on values and their meaningfulness – the parallel process to make a new strategy for the FNDC, led by the Commandant of the FNDC himself, seemed to be the most appropriate forum for such discussions. A more simplified version of the CHAT model was introduced by teacher K to be later explicitly elaborated by teacher I,

Excerpt 6.19

..I put it into a simplified form and emphasized three areas [issues]: teacher, student and outcome..it would be more motivating to work with such a simplified model than with the whole [the activity system] model *which cannot be influenced by our group*.

Later teacher I elaborated the idea into the form of a figure as presented below in **figure 6.2**:

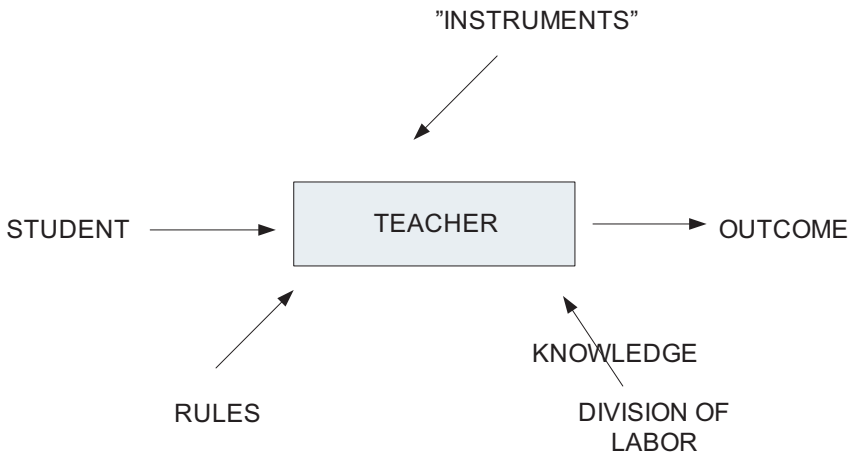

Figure 6.2 Model proposed by a teacher

To highlight an essential point in the figure, teacher I continued by saying,

Excerpt 6.19 continues:

..then this that [teacher D] spoke about, this production of knowledge..someone has to produce [also pedagogical] knowledge in this organization or it has to be got otherwise..

But what is the pedagogical expert organization in the FNDC capable to produce pedagogical knowledge or has the FNDC only one reasonable alternative for the need – to get pedagogical knowledge from outside of the FNDC? Interestingly the above mentioned knowledge production seems to be "hitting" on the cultural "walls" and barriers present at the FNDC, as already explained after the introduction of the principles of CHAT to the group during the second meeting,

Excerpt 6.20 (teacher E)

Here we have, as in Auschwitz, this cultural historical context. This [CHAT] was born in the Soviet Union where it was seen that the community has the power; [on the contrary] the American heroic legend tells the same story of a sheriff who shoots the deer [cf. the Leont'evian example of the ancient hunt told also to the group] and the community, especially the women, are just clapping their hands there.

Curiously, teacher E does not locate the Finnish military culture on the dimension between the Soviet [or the culture represented by CHAT] and the American individualistic culture. As previously studied at the FDF (Halonen, forthcoming), during the past decades the Finnish military culture has seemed to be shifting between individualistic and communal edges. Having different levels, the culture could be seen partly "hidden" in the individuals in their unconsciousness. Consequently, there is no reason to be surprised if the FNDC has been for some years expressing how it does value, for example, feelings of togetherness. But this comment leaves open the question about *the authentic culture of the FNDC*.

As has already been mentioned, also teacher E advised us to focus on culture (at the FNDC, the FDF and in Finland). In a way the dimension between an individual and the community comes to the fore. The group seemed to feel the centrality and essentiality of the shared enduring values. Despite of this the task (the value process or how to get people committed to the values) seemed to be more appropriate for the group making the new strategy for the FNDC led by the Commandant of the FNDC.

Teacher D explained how close our "windows of opportunity" seem to be, by emphasizing "evolutionary change" in the words below ,

Excerpt 6.21

> ..it does not matter what the outcome of our group turns out to be, recommendations to be used at the FNDC or not, the fact is that the world goes on in every case.

Curiously the teacher imagined ourselves as "the frogs in the Sengean boiler" being steadily boiled and unaware of the situation, just "drifting" and being satisfied by the current situation, at least publicly. This kind of view excluded the active role of the teachers but interestingly it was expressed by the very same teacher who sees teaching as a transmission kind of process done by "knowledgeable" teachers (cf. excerpt 6.3). The passive role of the teacher was not a shared point of view at the group according to several proposals (see e.g. **figure 6.2** by teacher I).

As presented in excerpt 6.13, the pedagogical guidance or support at the FNDC has been arranged, to put it positively, in a very scattered manner. Hence there are no formal methods at the FNDC for the teachers to develop their pedagogical competencies and capabilities. Due to the fact that the researcher serves in the pedagogical "expert"

organization of the FNDC[129], he felt a need to take the initiative and act in a morally responsible manner as a representative of the pedagogic expert organization.

Since 2001 the researcher has been developing an evaluation tool for the teachers (cf. chapter 5) and the teacher community at the FNDC. Also the development of the tool met quite severe resistance because the individuality of the teachers seemed to be threatened. But despite of this claimed "threat" there seemed to be relatively shared needs to give some pedagogical support and guidance for the teachers, as already shown during the first meetings.

In his explanations the researcher connected the ideas of shared enduring values, the espoused values of the FNDC (especially the expertise), "goodness" or "badness" of the teaching to the idea of an evaluation sheet for the teacher community. With the evaluation tool the current practices of the teachers was thought to be taken to the fore and to be developed by the resonation (societal progressive inquiries) with the social scientific theories combined by the pedagogical expert organization of the FNDC (the Department of Education).

The idea of simplifying the activity system model was introduced and elaborated by the teachers of the group (cf. excerpt 6.19 and **figure 6.2**). Despite of the claimed need to simplify and the need to focus on something "controllable", the idea of the evaluation sheet and the method were valued as interesting ones:

Excerpt 6.22 (teacher K)

This [project] is already in a good shape, as we already have some tools to develop these issues.

The teacher's evaluation sheet idea is discussed in the analysis of the fifth meeting as well as the other initiatives of the teachers at the FNDC. During the second half of the third meeting the discussion turned to the relationships between soldiers ("amateurs in pedagogy") and civilians ("experts in pedagogy) and between military pedagogy and university pedagogy as explained by the words of teacher F,

[129] Actually this could be only hypothesized when remembering the discussions in the other meetings.

Excerpt 6.23

..here we are in this meeting, and personally at least I am completely an amateur in these pedagogical issues, and it is a frightening thing as such to be debating on the basis of our personal intuitions..

But if then teacher F, and maybe some of the other teachers as well, feel themselves more or less as amateur pedagogs, is this feeling expected and acceptable from the angle of soldiership? In a hierarchic military organization the official expectations and the exact acceptability is shown by the current leaders of the organization and ultimately by the commander [or in this case by the Commandant] in question. Some shared expectations of the managers were in the thematic interviews (see the next chapter).

In the analysis of the fifth meeting there are some examples of how to overcome the contradiction between civilian pedagogical and military pedagogical practice successfully. As shown in **figures 6.1 and 6.2**, there seems to be some need for pedagogical knowledge production at the FNDC.

6.5. The fourth meeting – an emerging crisis

The group was routinely invited for the fourth meeting to be arranged on the 18th of January 2005. Originally the meeting was thought to be arranged in December but due to problems in finding a suitable time for it, the meeting was rescheduled for January.

Surprisingly only a few of the participants came to the meeting and the researcher felt put down. But the challenging situation turned out to be an effective brainstorming with a few participants. *To the researcher the episode was a strong signal of the need to change his plans and act differently.*

The researcher thought that maybe some past discussions were felt to be too theoretical and unpractical, although in the first meeting no theories were introduced. The researcher got an idea: maybe we have to take a close look at the current pedagogical practices, introducing the already done departmental pedagogical innovations to each other. Maybe the departments are not so familiar with the kinds of innovations made in the other departments? Maybe it could be more useful instead of weaknesses and problems to focus on strengths and possibilities?

The researcher had a brainstorming session with the colleagues at the scene and identified some interesting pedagogical topics to discuss. Each department got an opportunity to introduce its "pedagogical innovations" to the representatives of the other departments as follows:

- The Department of Technology: Science and its main characteristics (the idea came up due to a recently published publication of the department (cf. chapter 2 about the counterargument).
- The Department of War History: The learning log as a tool.
- The Department of Tactics and Operations Art: Teacher assessment as a balancing act for students' feedback.
- The Department of Strategic and Defence Studies: The process to identify the main pedagogical principles at the Swedish National Defence College.
- Department of Education: The Teacher's Self-Evaluation Sheet[130] (see **appendix 2**).

Also representatives of the Department of Management and Leadership were invited to introduce some of their present "pedagogical innovations" to the participants.

6.6. The fifth meeting

The fifth meeting was arranged on the 3rd of February 2005. All departments were not represented and there was one new participant. In the beginning of the meeting the researcher repeated in a little bit modified form his idea of the development on different intertwined levels. On the most simplifying level the development could be described as a movement from A (the current state) to B (the visionary endstate) by Cs (by e.g strategy). Naturally the effective use of even this formula demands that A is appropriately located "on the map". A SWOT-analysis (i.e. Strengths, Weaknesses, Opportunities, and Threats) is an appropriate candidate to be utilized in *open and constructively critical discussions.* "Below" this level we have made an analysis on the level of interconnected (**cf. figure 6.1**) activity systems. "Below" it the researcher identified some key educational dimensions for the teachers to be balanced on a daily basis[131]. Someway we discuss the very same issue on each particular level but when we go to the deeper

[130] The sheet has been synthetized from the research of Yrjönsuuri & Yrjönsuuri (1995); Mäkinen (1998); Helakorpi (1999, 2001). *It is essential to recognize that the Teacher's Self-Evaluation Sheet is not a quantitative but a qualitative evaluation tool.*

[131] The dimensions were: practice versus theory; old ("the given") versus new ("the produced and created"); individual versus community; local versus global; school versus work.

and deeper levels the complexity of the analysis grows, caused by the fact that more units and dimensions will be taken under consideration. Consequently the bounded capacity of the acting individual will be overloaded and he has to overcome his limitations by different kinds of methods, as by writing (including all kinds of drawings) and especially by collaborating with his peers on a communal dimension. When we see our situation like this, we can avoid the real possibility to be flooded by too many details and information, keeping the most fundamental questions in mind.

During the meetings the researcher emphasized how meaningful a role the choices of the individual teachers actually play for the social structures of the FNDC. Sometimes, as well as during the present process, it is argued that it is "impossible" for an individual human being to affect social structures. In order to enable the participants to see this "impossibility" to be at least occasionally a real possibility, the researcher told the participants a story of a learning log experiment initiated by an individual teacher from one department,

Excerpt 6.24

..one example of a department where an individual teacher has thought these things by himself and discussed his ideas with his colleagues, with his superiors and has then just started to use it in his own teaching, in cadet courses, in senior staff courses and in general staff officer courses and so on.

At first sight, the total activity seems to control the individual, instead of the individual controlling the activity (Engeström 1987, 66). However, the opposite is also possible because the actions of individuals may develop into an activity,

These are the ordinary cases when a person undertakes to perform some actions under the influence of a certain motive, and then performs them for their own sake because the motive seems to be displaced to their objective. And that means that the actions are transformed into activity. The transformation does not happen automatically or unconsciously but needs an act of reflecting and a special activity for these purposes – a learning activity. (Leont'ev 1981, 238; cf. Engeström 1987, 68)

This case shows how the actions of an individual teacher serving at the FNDC can also have some essential influence on the activities of the FNDC. In other words this means that by a relatively "simple" act of learning an individual teacher can turn the "impossibility" into a real opportunity.

Presently some individual teachers seem to be making pedagogical innovations for their own purposes but how about the communal aspect of the FNDC? Currently the communal aspect of the of the FNDC seems to be underdeveloped, as shown by the example quoted below,

Excerpt 6.25 (teacher L)

It has to be said and which I see as a major weakness here is *the lack of ordinary research groups [at the FNDC]*..

Currently some sort of cultural barriers limit the expansion of the communal dimension, as shown by the experiences during the Development Laboratory meetings (cf. e.g. the participants kept changing) and by the low intensity of the use of the Training Portal during the Bologna process (cf. the next chapter).

Now it is the right time to elaborate the draft analysis of the FNDC (**figure 6.1**). It seems that currently at the FNDC there exist several latent primary contradictions and a latent secondary contradiction, as can be seen in **figure 6.3**.

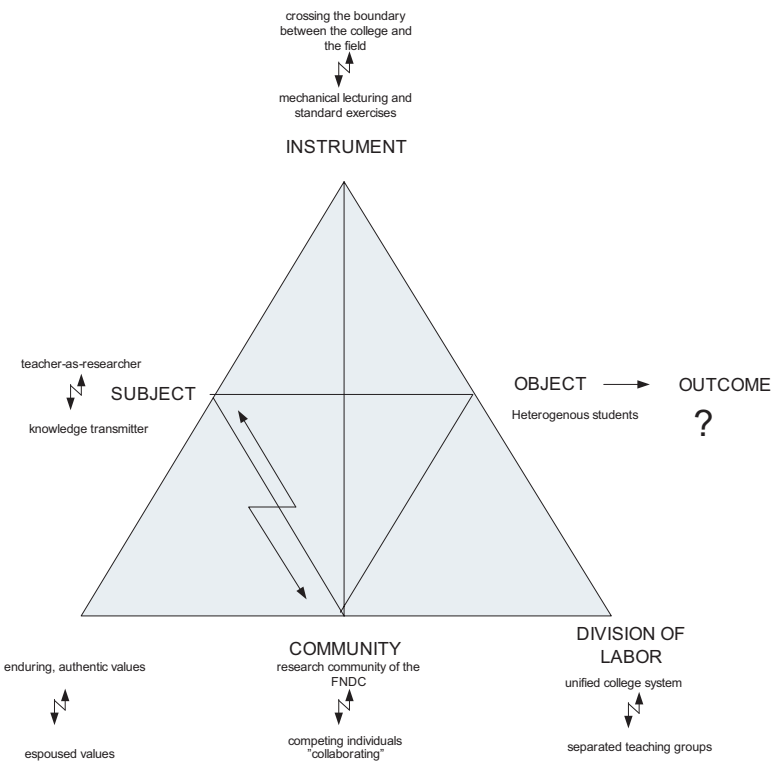

Figure 6.3 An elaborated analysis of the FNDC

Figure 6.3 explicitly shows how well aligned with the interpretations of the participated teachers the draft analysis actually was (cf. **figure 6.1**). There seemed to be some sort of agreement on the need states of the different aspects of the activity system of the FNDC, but despite of this, due to the latent secondary contradiction, the developmental mission was generally felt as impossible; at least for the teachers, but what about the managers of the FNDC? The answer to this question will be given in the following chapter.

Chapter Seven
THEMATIC INTERVIEWS AT THE FNDC

7.1. More fundamental questions than secondary ones

In the previous chapter the teachers of the FNDC participating in the Development Laboratory meetings shifted along the dimension between possible and impossible already in the very first meeting. It was explained that these kinds of actions are understandable due to the secondary contradiction between the subject and the community (cf. **figure 6.3**). Now the focus will be on the official representatives of the community in question – the managers of the FNDC, in order to see the social reality from their angle.

The rather widely shared view seemed to be that the teachers cannot contribute to the FNDC as a whole but have to take a more limited perspective (student, teacher and outcome; **figure 6.2**). If then the participating teachers cannot influence the FNDC as a whole, maybe the Management Group of the FNDC can? As experts of the disciplines, also the professors needed to be included among those to be interviewed.

The questions used in the thematic interviews are presented in **appendix 1**[132]. The intent of the researcher was to identify fundamental questions instead of secondary ones. The researcher assumes that the right answer to a secondary question is also secondary, but the fundamental question, even when insoluble in its exact form, can be a guide to a major discovery and to deep transformations.

It can be said that the "truth", or in this case the fundamentality of the questions, lies in the eye of the beholder. This time the "eyes" or "glasses" were made while researching for the theoretical part of the present study. Especially the theories of the cultural-historical activity theory, but not solely these, justify the fundamentality of the posed questions (see **appendix 1** for the links between the analyzed theories and the posed questions).

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[132] Chapter 5 contains some additional background information about the thematic interviews, including a description of how the analysis of the interviewed data was done.

In the beginning of each interview the researcher told the interviewees that he was ready to answer the questions concerning the research in progress and emphasized the main aim of the research: to develop the teaching practices at the FNDC. The researcher also suggested that the respondents could take in the first place a perspective not restricted to the departmental or even to the divisional level. Each person was asked to focus on the FNDC as a whole, the college having connections to the Defence Staff and to Ministries (especially the Ministry of Defence and Ministry of Education). Later some of the questions allowed those serving on a departmental level to restrict the scope into the department where the respondent worked.

As a background it is useful to know that at national Finnish level, all universities are steered by the Ministry of Education. On the other hand, the FNDC is a profit centre of the Defence Staff supervised by the Chief of the Defence Staff with the assistance of the Chief of Personnel. Since 1993 the FNDC has had a university status, and consequently a dichotomous and paradoxical situation has emerged, taking shape as a university-scientific versus a military organization paradox[133] (i.e. the USMO paradox) having different kinds of manifestations at the FNDC and elsewhere[134], as will be shown in the analysis.

7.2. Seeking guiding ideas and key pedagogical principles

The USMO paradox could be seen for example in the answers given by the respondents when asked to express the leading idea of the FNDC. On the other hand the FNDC was seen to be producing officers (professional soldiers) for the needs of the defence of Finland, but on the other hand the university status of the college was emphasized (an innovative research centre; university level research community etc.). Interestingly some respondents *synthesized* (they did not just choose one or the other aspect as a "right answer") these different aspects together to the idea of training and educating soldiers based on researched knowledge[135].

[133] Paradoxos in Greek combines two roots: *para*, which can mean variously beside, by, with, beyond, past, against, or contrary to; and *doxos*, which means "that which is generally thought or believed, "the common opinion". Interestingly a paradox is an argument in which you take sides – both sides. (Wilder & Collins 1994, 84-86) Often the paradox is interpreted as a dilemma (cf. chapter 3) but the main unifying idea is the *dimension between two essential poles of interest.*

[134] Since the autumn of 2001 the training and education of Finnish officers has been conducted at the FNDC and also in the schools of the services and branches, supervised by the FNDC.

[135] In the draft of the FNDC's strategy (6th September 2005) this point was mentioned in the form "the teaching is arranged based on research and practices in the field".

The role of the Ministry of Education in Finnish higher education seemed to be a professed fact by the respondents. The Ministry of Education has a seemingly clear role in controlling the educational activities of the FNDC. On the other hand the evaluation of the FNDC made by the Finnish Higher Education Evaluation Council (FINHEEC) in 2001 was familiar only to some of the respondents. Further on it seemed to be the case that more the strengths than the weaknesses mentioned in the evaluation report were analyzed at the FNDC. Only in one department a development plan based on FINHEEC's evaluation was made.

When focusing on the relations between the FNDC and the Defence Staff and the mentioned ministries, one point from the newly formed competence development strategy made by the Division for Personnel of the Defence Staff is especially interesting: the development of the training and education system forms the basis for the competence development of the FNDC[136]. The question asked by the FINHEEC in its evaluation report of the FNDC (2001, 10): according to what kinds of guiding principles the FDF is going to develop its training and education system, still needs an answer. Rather often also in the FDF the difficulty seems to be the general tendency to see the trees instead of the forest; details are discussed instead of the question of how to guide the systems. Hopefully this tendency will be overcome when the FNDC gets prepared for the next evaluation of the FINHEEC.

Another conceptual structure emphasized in the competence development strategy is the learning organization (cf. chapter 4). When asked about the meaningfulness of the idea of the learning organization, the respondents could be grouped to those considering that there have been learning organizations in the FDF for a long time already (e.g. the military units), and those who saw that the importance of the idea was relatively small or "numerically zero". Interestingly those serving on the departmental level were more sceptical than the others of the idea of the learning organization.

If the idea of the learning organization divided the opinions of the respondents, how did they understand learning itself? The respondents understood the concept of learning very differently. Some of them emphasized that the students need some background knowledge and understanding to be able to solve practical problems. It could be said that generally speaking learning was identified to be a unification of learning "old things" and creating something new. Learning was not limited to "internalization" or to "appropriation" of the given information but it was also seen to have a functional and practical

[136] Competence development strategy (2004, 5).

aspect (i.e. identifiable e.g. in the capability to solve practical problems).

When asked about the pedagogical principles, two main idealistic themes emerged over others: focusing on wholes, and individual responsibility to solve problems when learning. Although the individual responsibility of the students was emphasized, the overindividualistic competition was identified to be balanced by an emphasis on social cooperation, which is already the general strength of the students.

Learning seemed to mean the ability to show on a practical level how the learner has learned. Hence the question of assessment methods was a fundamental question. In their answers the respondents stressed quickness, easiness and the feedback system (feedback received from the students, ex-students and their superiors). The responsibility of the assessment practices seemed to be shared more or less by the students, ex-students and their superiors. In one department a teacher has developed a new kind of tool for evaluation, a learning log, but the log method was not used by the other departments[137].

The question about the need to look at the assessment methods at the FNDC emerged already during the Development Laboratory meetings[138]. There the question was put into the form: "What kind of know-how are our tests actually assessing; some kind of [disciplinary] know-that or something else?" When the researcher asked about the discussions concerning "the problem" the lack of open discussions came up as a response.

Starting to learn seems to need some willingness to confess that some problems do exist[139]. The same demand applies also on the level of organizations. The learning organizations have to be able to identify some "potential problems" and societally make them authentic and shared problems to be solved. One more example of the cultural barriers hampering this development was also explicitly identified at least by some of the respondents. The intent was to use the Training Portal as a planning tool enabling open and fruithful discussions, but contrary to expectations "people used the technology badly" (i.e. the Portal) and the intensity of the discussions remained on a low level. It could be said that the organizational silence restricts potential problems from becoming authentic and shared problems waiting to be solved in the process of learning.

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[137] The Continuing Education and Development Centre offers an exception in this case, having put the same idea into practice during the past years.
[138] Cf. Chapter 6 and excerpt 6.15.
[139] Cf. the following chapter about the analysis of the learning concept from a social scientific perspective.

One main principle often emphasized by the respondents was the comparability of the degrees (civilian versus military ones). The principle has been highly valued at the FNDC, aiming to get and sustain its university status. The importance of the comparability principle has been increased also through the Bologna process[140]. Despite of this, the degrees of the FNDC have also lately kept shifting between comparable and incomparable (Viitasalo 2005).

Another main principle, answered in the form of the leading idea of the FNDC by the respondents, was the training and educating of soldiers based on researched knowledge. The respondents saw that so far the biggest reform of the Bologna process has been the emphasis on scientificness. But what is the essence of being scientific? Based on what kinds of shared principles and ethos the boundary between "civilian science", military science and the ordinary activities of the professional officers will be negotiated and renegotiated by each individual researcher on a continuous basis? When the military researchers give reasons for e.g. the choices of books (cf. choices of theories; various kinds of choices needed to be done during the research process), what kinds of reasons do they give, if any?

The researcher asked about the principles behind the choices of the books and the respondents expressed views like "the classics must be read", "centrality", "stimulating", "offering problems". Curiously explanations related to scientificness or some sort of scientific ethos were missing. Obviously at the FNDC much work needs to be done also on the metatheoretical or philosophical level when the basic assumptions of social scientific research are scrutinized[141].

In the renewal processes of the FDF's officer education system the guiding object of the developmental activities seem to be a written curriculum. The researcher asked about the idea of the curriculum having three layers[142]. Some respondents were not familiar with the layered curriculum idea but those who were could be divided into two groups: those who saw the layeredness as a process (first the written, then the taught and finally the learned) and to those emphasizing the levelness of the curriculum (we have to act simultaneously on all of these different layers and especially focus on

[140] Cf. e.g. Bologna Process; http://europa.eu.int/comm/education/policies/educ/bologna/bologna_en.html. The European higher education will be developed based on a set of specified objectives, such as the adoption of a common framework of readable and *comparable* degrees, two levels of degrees, the ECTS-compatible credit system, a European dimension in quality assurance and the elimination of remaining obstacles to the free mobility of students. On the other hand for example the fundamental principles of *autonomy* and *diversity* are respected.
[141] Chapter 2 shows the position of the researcher in these kinds of questions.
[142] Cf. Karjalainen's (ed. 2003) and Tyack and Cuban's (1995) argument explained in chapter 3. According to them the educational reform could be divided into three stages: reform talks, adoption of reform (=at least producing a written curriculum) and the actual implementation (=on the layers of taught and learned curriculum).

what will be learned in practice). It seems that the respondents shared a view that the concept of learning is a key issue and in the future we need to focus more on how we conceptualize the learning. Consequently, the deep transformational educational planning cannot be replaced solely by focusing on the production of a written curriculum or by the use of planning tools (i.e. the Internet-based Core Edit (a Finnish tool of the ECTS system, cf. the main Bologna principles).

Let us return briefly to the issue of organizational silence. Some of the respondents said that maybe there have been too many and too long discussions during the Bologna process, slowing down the otherwise rapid planning process. The silencing of organizational discussions could be the most effective way to act if the process is reduced only to the level of the written curriculum. When remembering the other layers of the curriculum, we do not have the alternative of avoiding discussions, at least if the goal is effective educational development or even educational transformation. If the discussions need a more focused structure and alignment, this could be achieved by the identification of the fundamental questions and starting the planning process from these kinds of questions instead of decentralizing the issues to be dealt with in the six autonomous disciplines, and controlled by unidentified principles.

The dangers of imitation and blurred identity were noticed by the participants of the Development Laboratory meetings, but how about the respondents of the thematic interviews? In general the FNDC follows the actions of the European universities by participating actively in the Bologna process. Interestingly, not so many other European military educational institutions have joined the Bologna planning process as actively. We cannot overrule the possibility that the active role taken by the FDF in the Bologna process could have a meaningful influence on other nations dealing with same kind of challenges and problems but presently the paradox is clear: the Europeans are integrating their higher educational systems, but military educational systems are in the periphery or sometimes not even on the map of the process[143].

[143] Despite of these kinds of national differences, the USMO paradox is a universal one due to the fact that the spheres of science and "lay military work" still coexist, having various kinds of relations causing e.g. quaternary contradictions to emerge. One of the key issues is whether the USMO paradox is tried to be solved inside the military educational system or out of it in the military units.

7.3. Solving the key paradoxes; USMO and Soldier's Basic Paradox

When the spheres of interests of the military educators and those who are in charge of the development of the military educational systems as a whole keep widening, it is interesting to recognize how differently the different nations have solved the paradoxical situation between soldiership and scientificness.

Although the respondents explained that the FNDC has to adapt to the general principles shared by the Finnish and European universities, some core features of soldiership need to be remembered in the "adaptation process" guided by the dominant principle – comparability.

In the midst of the turbulent, even chaotic, globalizing environment, the huge information overflow and increasing complexity of social systems seem to have obvious consequences on individuals. Nowadays it seems to be almost impossible to identify what is going on and make sense of it and at the same time not lose touch with the most important issues – what is the *purpose* of this all? What are we *aiming at?* What is and should be the main *outcome* of our military educational system? To avoid these dangers we have to focus on the forests rather than the trees – on the fundamentals of the specific social system in question.

When asked, the respondents named some core features of soldiership as worth nurturing. An officer's basic virtues, such as capability to lead, manage and execute plans, positive discipline and order, shared communal values and morally ethical aspects were emphasized by the respondents. But how systematically do we nurture these kinds of virtues in the decentralized military educational system of the FDF?

Traditionally, a good officer has been understood as an individual actor on the battlefield; especially capable to lead, train and educate his personnel and troops. Obeying orders, just doing and thinking less, has been the main idea behind the educational arrangements. But interestingly, a good officer and a good soldier has always been aware

of the fundamental paradox: the Soldier's Basic Paradox[144]. According to the paradox, *obeying orders is not enough* but the individual officer needs to use all his resources as effectively as possible to achieve effectiveness and gain good results. He has always had to act "beyond" the ordered.

In other words the secondary contradiction between the subject (i.e. the individual teacher) and the community could take the form of the Soldier's Basic Paradox. Obviously the relationship between the deep-seated paradox and the identified secondary contradiction needs to be understood (cf. chapter 8).

Presently the paradoxes and the identified secondary contradiction seem to be made into a solvable form along the *key educational dimensions* as follows (cf. chapter 9 for a practical example),

- Practice (knowing how) versus theory (knowing that).
- Old (internalizing the given) versus new (combinatorial innovations; knowledge creation and production by progressively inquiring).
- Individual versus community.
- Local versus global.
- School versus work.

In the past just *knowing how* to win and survive on the battlefield has been the only relevant goal. Hence, the need for theories (*know-that*) has always been rather difficult to explain and to understand[145], but essentially needed to be understood also by the officers. Also many of the respondents stressed that the officer of our age needs to learn to research and to integrate the researching to his normal way of working (e.g. as a teacher).

Previous generations have not solved our problems and we cannot solve our students' problems on their behalf, was a shared opinion of the respondents. On the other hand, also in the FDF we are used to developing "solutions" on a continuous basis, but the reasons behind

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[144] The Soldier's Basic Paradox is a metatheoretical (cf. Toiskallio 2002, 86) paradox that needs to be solved. On the theoretical level this metatheoretical problem is akin to the Leader-Follower Paradox (or the Burns Paradox; Burns 2003, 171) emerged in the field of transformational leadership (Burns 1978, 2003; Bass 1998). By the words of the Deep Leadership Model (a transformational leadership model developed at the FNDC, Nissinen 2001) the paradoxical question is mainly about which one of these two leadership dimensions (i.e. transactional and transformational) is more dominant in the behaviour of a military leader. Cf. also Macgregor (2003, 208); Brownlee & Schoomaker (2004); Dixon (1976, 194). Hawkins (2001) name unity, endurance, obedience, hierarchy, and readiness for violence as the main American warrior premises. The fact seems to be that these kinds of premises are universal by nature and the main question deals with the dynamic nature of the premises. The case of obedience clarifies the point. Of course also in the future soldiers and officers are expected to obey orders but this does not tell the "whole truth" of the case.

[145] Cf. the translation mistake in the case of military pedagogy presented in chapter 4.

these solutions need to be made more transparent and justifiable. The reason for acting in a traditional way cannot be justified by the saying "because we are used to doing so". Therefore, understanding the understanding (also emphasized by some of the respondents) comes to the fore (cf. the following chapter).

When asked about the role of the individual teachers in the Bologna process, and in the educational development in general, the centrality of the teachers in the process was a shared opinion of the respondents. This answer is paradoxical when comparing to the interpretations of the participating teachers during the Development Laboratory meetings when they were wondering about the possibility or maybe the impossibility of themselves to influence on the FNDC as a whole and as a system. Maybe the teachers are not aware of the expectations of the managers of the FNDC?

In the FDF and also in the FNDC there is a tendency to emphasize the centrality of the cultural aspects and consequently its relative stability. Interestingly, the respondents emphasized that (the culture of) the FNDC will certainly be carried by the tide of Finnish culture, overruling the need for teachers' activeness and innovativeness. Paradoxically the respondents stressed that the teachers will play an active role in the development but on the other hand this activeness is expected to be useless because of the "evolutionary change process". Consequently, an appropriate role for the officers is expected by the respondents to be passively adapting to the changing situation. As a counterbalanced act the activeness of the individual agents (i.e. the teachers) needs to be reconsidered and the possibility to develop societal structures (i.e. culture) needs to be understood (cf. chapters 8 and 9).

When struggling with such difficult paradoxes as the Soldier's Basic Paradox, imitation guided by the comparability principle is not all that is needed. Solving the paradox effectively needs more than just imitating best practices, especially when in the field of schooling there is lack of such systemic and well aligned best practices. The roots of the paradoxes and problems have to be faced and it is impossible to do this without focusing on how to enable teachers to develop themselves and their peers and become more like what they keep teaching to their students (i.e. to make justifiable judgements based on research and give reasons for their own actions). Hence, on the 28th of July 2005 the researcher sent a Teacher's Self-Evaluation Sheet with the needed instructions to the teachers of the Department of Education in order to focus on teaching practices[146].

[146] The idea of the sheet was elaborated during the Change Laboratory meetings. Cf. chapter 6.

During the interviews the respondents told researcher about many pedagogical innovations, such as emphasizing key principles instead of details, web-based blended education, learning in small groups, use of assistants[147], staff excursions and inquiring stance on working. The innovativeness of the departments varied a lot, small departments being the most innovative. Paradoxically no traces of research-based pedagogical development were noticed. Some of the respondents told the researcher that the Department of Education was expected to be a producer of "practical pedagogical knowledge". So far the Department of Education has not met with these expectations (cf. also chapter 6).

When we begin to discuss the expertise in the case of the FNDC, we simultaneously have to focus on the espoused values of the FNDC[148]. Also in the Development Laboratory meetings the essentiality of the shared values was notified, and a similar conclusion was made by the interviewees. It was stated that values guide our actions and activities but how about then in the case of expertise?

The relationship between officers and civilian university graduates (i.e. "pedagogical experts") recruited from the civilian markets deserves to be reconsidered. Paradoxically these "pedagogical experts" enter the core area of soldiership as mentioned above, having a lot of useful experience and theories from universities but lacking experiences gained from the field (i.e. the military units). The proposal of the researcher is that instead of looking out, and expecting that more civilian "pedagogical experts" will solve our pedagogical problems, the FNDC needs to concentrate on the development of the pedagogical expertise of their own teachers[149].

If the FNDC really values expertise, and especially pedagogical and managerial-leadership expertise, the college has to identify what it means by the expertise or pedagogical expertise. A close look at the present state of the educational practices have to be taken and individual knowledge of how to train and educate needs to be "externalized" to be socially scrutinized. Hence, the Teacher's Self-Evaluation Sheet as mentioned above.

When speaking about the values, the respondents mentioned that the issue is wider than the espoused values of the FNDC. The value discussions at the FNDC have to take also academic or scientific values (i.e. the ethos of science) and basic values of soldiership under

[147] Students who were more knowledgeable or competent in the issue to be learned.
[148] The espoused values of the FNDC are patriotism, expertise, trustworthiness, feeling of togetherness and development.
[149] We can hypothesize in a parallel manner in the case of leadership and management. Will the FNDC try to recruit civilian "outsiders" to be experts on leadership and management in the FDF or develop themselves as experts of leadership and management?

consideration. It is not only discussions that are needed, but the made conclusions have to be identifiable in practical educational activities as well. Some of the respondents wondered how the espoused values of the FNDC could be turned into authentic ones. If the FNDC values expertise, how is this seen in, for example, the strategy planning process of the FNDC? Or in the Bologna process?

Along the dimension of local and global the respondents saw that in the future the continuing internalization will be a fact. Presently the international cooperation is at the FNDC arranged unsystematically and lacks strategic guidance. The respondents said that the arrangements have to be systematized and activated on all disciplines and in all levels of the military educational system. Maybe this tendency could be seen in the newly made strategy of the FNDC or in the strategies made by the departments?

Presently the community aspect has been gaining some ground among the Armed Forces because of the increasing interest in communities of practice[150] (i.e. communities of experts). It needs to be emphasized that also these constellations could be partly consciously extended and enabled. Through communities an educational institution could extend its networks to be effectively used in educational practices. More interestingly, they should be globally expanded among the military educational institutions.

The relationship between school (the FNDC; as B) and work (the military units; as A) seem to be in need of reconsideration. According to the responses, the present situation can be put into the form of the formula: A -> B. In this formula B (the FNDC) expects to get feedback to be able to measure how successfully it has taught its students. Actually this kind of formula does not recognize that in reality the FNDC is powerfully influencing, through the graduating officers and publications, the resources of the profit centres of the FDF and FBG. This means that the formula has to be corrected into the form: A <-> B.

Someway the respondents have identified the correct formula when they emphasized for example the need of the student to learn to solve problems. Due to the fact that mainly the problems of the FDF can be identified *on the field,* the dimension between the FNDC and the other profit centres needs to be reevaluated. In practice this could mean that instead of dealing with well-defined problems made by the teachers, the students have to face the ill-defined problems of the

[150] Lave & Wenger (1991); Wenger (1998); Wenger, McDermott & Snyder (2002); Kilner (2002); Brown (2003). See the analysis in chapter 8. For current examples see e.g. companycommand.com and squad-leader.com.

field units and organizations. This means that also the FNDC has ill-defined problems to be used in its teaching.

7.4. Who are and should be the objects (active versus passive students) of our schooling?

When focusing on the problem of how to effectively produce a new written curriculum within the given time limits, the layredness of the curriculum, and consequently the main issue (the learning of students), is left almost untouched.

The respondents said that the activeness and the responsibility of the students is highly valued. Lately the PISA (The Programme for International Student Assessment) reports have given some of the respondents high expectations on the student population of the FNDC. Contrary to these kinds of expectations, heterogeneity of the students was identified in a study made with the assistance of the Centre for Educational Assessment[151].

The question about the increasing responsibility of the heterogeneous students is not an easy question at all, but despite its difficulty it needs to be faced on an ongoing basis by the teachers, departments, divisions and the schools of the services and branches. The main idea[152] of the need of a close look was put into an explicit form by colonel Douglas Macgregor when he analyzed the transformation of the Armed Forces of the United States of America: "It is unrealistic to expect that military leaders will demonstrate the requisite physical energy, mental agility, and moral courage in war to inspire subordinates to exercise initiative, to innovate, and to take risks if they have been discouraged from doing so throughout their military careers" (Macgregor 2003, 208). The question seems to be highly relevant also in the case of FDF and the FNDC.

Presently the educational arrangements restrict the flourishing of the principles of activeness and individual responsibility. Putting the problems into the form of a question, we have to ask whether we will change our key principle or our educational practices in this case?

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[151] The Centre for Educational Assessment is a research centre of the Faculty of Behavioural Sciences at the University of Helsinki in Finland.

[152] The very same idea comes to the fore when solving the Soldier's Basic Paradox.

7.5. What is and should be the intended outcome of our military education?

Using the methods of MBO (Management by Objectives), the final outcome of the FNDC seems to be "the number of graduated students". Another key objective seems to be the "level of feedback". But is this really the final outcome of schooling in the FDF?[153]

The reasonability of the level of student feedback as a result objective was severely challenged by the respondents. They saw that the quantitative result objectives were not so essential as *qualitative ones*. Although we cannot to a full extent measure qualitative features, the "unmeasurableness" needs to be faced instead of neglecting the importance of the qualitative aspects.

In the beginning in the 1920s European military pedagogists made collaboratively a combinatorial innovation for developmental purposes: the concept of action competence (Toiskallio 1996, ed. 2000, ed. 2003a; Florian ed. 2002). The concept of action competence has four intertwined dimensions: psychic, physical, social and ethical (Toiskallio 1998ab, ed. 2004, 109), giving some guidance for further inquiries to understand the secrets of human actions and activities (cf. Toiskallio 1998b, 161). Presently in the FDF the action competence concept has been melted to the emphasis on competencies[154], causing metaphorically speaking an overemphasis on the tree (codifying the competence requirements in the form of competence maps) and almost neglecting the soil (action competence; authentic competencies).

For the FNDC this means that for a start, as a result of the college's educational activities, the graduating officers should be as action competent as possible. Naturally this does not exclude the need to get more specific competencies during the studies. The general tendency at the FNDC is to imitate and adapt concepts from the civilian world without hesitation (e.g. the concept of competencies) and to neglect combinatorial innovations made in the FDF. This attitude will be challenged in chapters 8 and 9.

As mentioned above, despite the almost systemic neglect of the action competence concept, the respondents emphasized the ethical dimension a lot. When connected to the emphasis on the written curriculum it is interesting to recognize the neglect of the ethical dimension in officer education, especially on the senior staff and general staff levels.

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[153] In the Annual Order of the FNDC for 2005 the expected outcome (the level of student feedback) is balanced by the feedback of the superiors of the ex-students.
[154] Cf. Competence development strategy (2004).

7.6. Decentralization as an overriding norm and misalignment as a fact

Because decentralization seems to be the overriding norm[155] of the Finnish officer education, open and fruitful discussions between the departments (which are in charge of the guidance of the service and branch schools in a particular discipline) and the service and branch schools are in a need of expansion. Not only the coverage and the intensity of the discussions are what matters, but the FNDC needs to clarify its shared pedagogical and other kinds of guiding principles to be able to explain its expectations in an aligned manner to the service and branch schools. And because these schools receive guidance from various sources, alignment and consistency[156] need to be achieved in the intertwined learning organizations of the FDF.

When taking a holistic view "above" the military educational "transformation" happening at the FNDC, guided partly by the Chief of the First Degree Division and partly by the Chief of the Postgraduate Degree Division, *misalignment* was identified by the respondents. Some respondents thought that the new vice commandant, concentrating for example on the development of teaching, is the answer to the present misalignment. It will be interesting to see what kind of guiding principles will be used by the vice commandant and how effectively the developmental influence can be extended over the vast network of the Finnish Officer Education system, especially if done under the circumstances of organizational silence.

During the thematic interviews the researcher tried to identify exactly and truthfully the present situation at the FNDC seen from the managerial perspective. Each of the respondents got a suggestion to describe somehow *on paper* how he personally saw the present state at the FNDC (position A) and the desired future state (position B)? As mentioned above, the focus was already in the beginning said to be on the educational practices of the whole FNDC.

The analyzed drawings showed misalignment of the analyses of the present as well as of the future state of the FNDC. This point can partly be explained by the fact that the planning process for a new strategy was going on at the FNDC at the same time. On the other hand, the fact can be explained by the different kind of perspectives of the respondents. This distortion was tried to be avoided by asking the interviewees to focus on the FNDC as a whole organization. In the

[155] The studies are arranged in the First Degree Division and under its supervision in the service and branch schools all over Finland.
[156] Cf. The Annual Order of the FNDC for 2005 where consistency and development are emphasized for the whole military educational system.

future, when the strategy is completed, it will be interesting to focus on the kind of means by which the identified misalignment will be met.

7.7. Towards aligned practice of schooling at the FNDC

The position taken in this study (cf. chapter 2) is that social scientific research is and should to be a *double hermeneutic process (*Giddens 1984, 1990a, 2001; cf. also Habermas 1984); an interaction between the meaningful social life of the practitioners and the social scientific worldview. In the process the need for change is balanced by understanding why and how the development can be achieved.

Operating at the intersection of two frames of meaning, the lay worldview and the social scientific worldview expressed by the chosen research programmes, the researcher has taken in chapters 6 and 7 a close look at the current pedagogical beliefs at the FNDC needing to be reflected both on individual and collective levels. In the following, the focus will again be on social scientific theories, trying to bring new theories into the military scientific knowledge base, offering some proposals and suggestions as guiding principles for the teachers of the FNDC and the service and branch schools. Consequently, further learning processes emerging in the Finnish military educational system (FMES) will be enabled by the researched social scientific knowledge. Ultimately, as a result of the learning processes in the Finnish military educational system, the state of pedagogical alignment will be the desired end state to be aimed at, although never to be fully gained. Why not? The researcher assumes that the right answer to a secondary question is also secondary, but the fundamental question, *even when insoluble in its exact form*, can be a guide to a major discovery and deep transformations.

Chapter Eight
THE ESSENCE OF LEARNING AND WHAT WILL BE LEARNED

8.1. A brief introduction to learning and constructivism

As noted in chapter 4, the FDF aims to operate according to the principles of the learning organization, and the official conception of learning of the FDF was explained in chapter 4 as well. In chapters 6 and 7 it was identified how teachers and managers of the FNDC interpret the meaning of learning. Here the intent is to shift the perspective to a social scientific one and inquire to the depths of the concepts of learning, knowledge and knowing.

According to Peter Jarvis (1999, 104) learning can be understood as

- A more or less permanent change in behaviour as a result of experience.
- The acquisition of knowledge, skills and attitudes as a result of experience.
- The transformation of experience into knowledge, skills, attitudes, values, beliefs, senses.
- The construction and transformation of experience into knowledge, skills, attitudes, beliefs, values, emotions, senses, etc.

In chapter 4 it was explained how the official conception of learning in the FDF has been influenced by experiential learning and especially by constructivism. Also here the intent is to open the black box called constructivism and to identify what kinds of tools (i.e. theories) have been labelled as "constructivistic" ones.

Constructivism seems to be a loose collection of theories ranging from the philosophies of Kant, Piaget, Kuhn and Dewey to the social scientific theories of Vygotsky (sociocultural theory; cultural-historical activity theory), Blumer and Mead (symbolic interactionism; see e.g. Charon 2004), Gergen (social psychological constructionism) and von Glasersfeld (radical constructivism) (Prawat 1996; Phillips 1995; Miettinen 2000b; Bransford, Brown & Cocking eds. 2000, 10–11).

Psychology, and constructivism, owes a great deal to the work of Jean Piaget (1896–1980; cf. Vygotsky 1986, 12; Wells 2001, 176). Although Piaget revolutionized the study of the child's speech and thought, his work bears the stigmata of crisis characteristic of all modern psychology. The historical development of psychology has led to a situation in which, to borrow the words of Franz Brentano[157], there are many psychologies, but there is no one, unified psychology (Vygotsky 1986, 13).

Piaget proposed an account of intellectual development that emphasized the learner's active, exploratory transactions with the environment. Prior knowledge arises out of reciprocal processes that Piaget called assimilation and accommodation. If the new information appears to be compatible with what is known, it will be easily assimilated, although it may be reformulated to some degree in the process. If, on the other hand, it is in conflict with what is known, either the new will be *rejected* or the existing knowledge will have to be transformed in order to accommodate the new. In either case, however, what is known by any individual is the outcome of a continuing constructive process that depends on opportunities to encounter and make sense of challenging new experiences. (cf. Bereiter 2002, 228–229; Hakkarainen et al. 2004, 20; Wertsch 1991, 19)

According to Vygotsky, one main flaw in Piaget's research was his universalistic presupposition that learners, in all essentials, are the same at all times and places, believing that a child's thinking goes through certain phases and stages *regardless of any instruction given* (Vygotsky 1986, 176). Consequently, Piaget paid less attention to the cultural context within which development occurs (Wells 2001, 177; Wertsch 1991: 1993, 19).

Of course, at least to some extent, Piaget also recognized the importance of the child's intellectual development of knowledge obtained through social interaction with others, although he did not consider it adequately in his theories of cognitive development (Wells 2001, 177; cf. Olson 2003, 136). According to von Glasersfeld this criticism is unjustified because if one reads Piaget's original works with the necessary attention, one finds that somewhere in almost every book he reiterates that the most important occasions for accommodation arise in social interaction (von Glaserfeld 1995, 11). But how then can a teacher arrange a proper context for effective learning or is it even needed from the Piagetian perspective? Further on, we should ask what the role of a Piagetian teacher actually is.

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[157] Franz Brentano (1838–1917), German philosopher and psychologist. He is famous for having introduced the notion of *intentionality* to contemporary philosophy. See e.g. Varela, Thompson & Rosch (1991, 15–16).

According to von Glasersfeld, learning requires self-regulation and the building of conceptual structures through reflection and abstraction. The effective motivation to continue learning can be fostered only by leading the students to experience the pleasure that is inherent in solving a problem seen and chosen as one's own. Whereas the trainer focuses on the trainee's performance (the behavioristic stance), the teacher must be concerned with *what goes on in the student's head* (i.e. the constructivistic stance). (von Glasersfeld 1989, 163, 1995, 14) It seems obvious that at least radical constructivists do not solve the perennial problem of the Cartesian split (cf. Bereiter 2002) at least if we remember that we are teaching whole human beings instead of "heads" or "minds".

During the development of constructivism the movement has shifted from individual-oriented radical constructivism[158] towards social constructivism or social constructionism. In a sense social constructivism seems to be an extension of radical constructivism, including some appropriate and inappropriate (cf. the good and bad features by Phillips, 1995) features. It seems to be appropriate to focus on the individual learner (quite often an active one) both influencing and being influenced by the social context.

Identification of the historical roots of constructivism is a necessity in order to explain the present position of constructivism. Carl Bereiter (2002, 293; cf. e.g. Miettinen 2000b) has argued that there seems to be a line of pedagogical cultural evolution where constructivism (or more precisely radical constructivism) *had* its proper role. Due to the fact that this cultural evolution is proceeding we have to open the black box named "constructivism" and focus on the different kinds of pedagogical theories inside it (e.g. the cultural-historical activity theory).

When analyzing radical constructivism critically, the following key questions can be posed:

– How do we account for the fact that learners are able to build for themselves concepts that seem fully congruent with those of others?
– Is it useful and justified to draw people apart rather than bring them together in a learning situation?
– If the purpose is to understand a phenomenon as learning why there seems to be no need to go beyond the individual learner?
– How do people bridge individual and public possessions? (cf. e.g. Sfard 1998, 7-8; Cobb 1994, 19; Miettinen 2000b)

[158] Cf. Nissinen (2001) as a counterexample of this.

Because man is fundamentally a social being, we have to make the dialectical interdependence of social and individual processes more explicit. Instead of focusing on the individual mind in a vacuum we have to see him in the middle of social interactions where the very existence of the whole (the whole person in context; cf. e.g. Toiskallio eds. 2004, 126) is fully dependent on the parts.

Also more general questions about learning should be asked, especially before starting the following analysis. Learning seems to be a process where *experience* is transformed into *knowledge* and into other individual features (skills, attitudes, values, beliefs, senses, emotions). But what does it mean to have an experience and what do we mean by knowledge, and what does the talk emphasizing the difference between knowledge and knowing mean (for a start cf. chapter 4)? How can learning be integrated into the scheme?

8.2. "Having an experience" by Kolb

Experiential learning is an important approach within the theoretical tradition of education in almost all continents (see e.g. von Krogh, Ichijo & Nonaka 2000 for knowledge creation; Boud & Feletti 1997 for problem based learning). David Kolb's book *Experiential Learning* (1984) is the best known presentation of the approach (cf. Jarvis 1987, 1992; Dixon 1994; Dierkes, Antal, Child & Nonaka eds. 2001). As shown in chapter 4, there is a tendency in the FDF to refer to the theories of Kolb when trying to figure out the basics of the concept of learning. Hence, a critical analysis of Kolb's theory of experiential learning is in place.

In his book *Experiential Learning* Kolb states that the intellectual origins of the book are in the work of John Dewey (1859–1952), Kurt Lewin (1890-1947) and Jean Piaget (1896–1980). In the book Kolb names his model as *The Lewinian Experiential Learning Model* but the model is generally known as Kolb's model. He emphasizes two aspects of his learning model that are particularly noteworthy. The first is its emphasis on *here-and-now concrete experience* to validate and test abstract concepts. Kolb's intent is to differentiate the experiential learning theory from rationalist and other cognitive theories of learning but also from behavioural learning theories that deny any role for consciousness and subjective experience in the learning process. Second, he emphasizes *feedback* processes familiar from the Lewinian tradition. (Kolb 1984) Kolb's learning model is shown in **figure 8.1.**

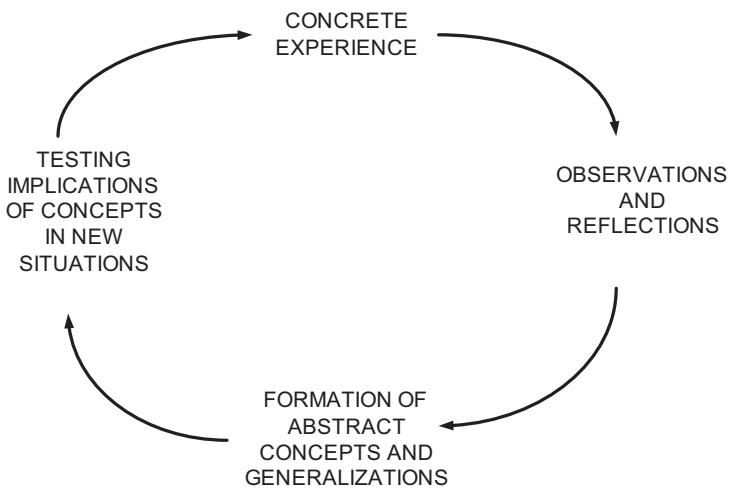

Figure 8.1 Kolb's learning model
Source: Kolb 1984, 21.

Although widely referred to, Kolb's model has been criticized for being too simplistic (Jarvis 1987, 1992) and a collection of theoretically unrelated concepts (Miettinen 2000a; Tuomi 1999). Especially Kolb's conception of experience has been interpreted to be a problematic one (Miettinen 1998a; 2000a), as it assumes that experience is more or less a mental phenomenon (Tuomi 1999) and gives an inadequate interpretation of Dewey's ideas. The case seems to be that Kolb both gives a unilateral and erroneous picture of Dewey's theory of experience and reflective thought and action (cf. Miettinen 2000a). Consequently, Deweyan philosophies deserve more careful analysis than that done by David Kolb.

8.3. Experience and inquiry by Dewey

For John Dewey (1859–1952) the job of the (American) intellectual was to attempt to address numberless social problems. For him, addressing these ills also meant the application of philosophical wisdom to the intelligent conduct of the affairs of social life. Dewey's social philosophy (cf. Pragmatism; Instrumentalism; Experimentalism) is a combination of the inquiring and critical spirit of Charles Sanders Pierce (1839–1914), with a focus on the issues of general and direct human concern that interested William James (1842–1910)[159].

[159] Cf. Dewey (1925) The Development of American Pragmatism in Hickman, Alexander (1998).

John Dewey is the founder of the Chicago School of Pragmatism with for example James H. Tufts (1862–1942) and George Herbert Mead (1863–1931). This developing philosophical view includes

- A metaphysics that emphasizes processes and relations.
- A naturalistic and evolutionary understanding of human existence.
- An analysis of intellectual activity as problem-oriented and as benefiting from historically developed methods.
- An emphasis upon the democratic reconstruction of society through educational and other institutions. (Campbell 1995, 14)

There are two basic assumptions underlying this perspective (Campbell 1995, 13): firstly, a melioristic belief that although there cannot be guarantees that our efforts will make our situation better, the improvement of our situation is a real possibility. Secondly, we can learn from our mistaken efforts. The melioristic perspective[160] offered by Dewey seems to be even more promising in our "postmodern situation" when we are almost loosing our faith in the control of social forces and the contribution of individuals. It is worth making a difference between optimism and meliorism. According to Dewey meliorism is the belief that the specific conditions which exist at one moment, be they comparatively bad or comparatively good, in any event *may be bettered* (Dewey 1920, cited in Campbell 1995, 261). Meliorism thus encourages intelligent action and human effort, which pessimism cannot, and arouses confidence and hopefulness without relaxing us into optimistic passivity.

Not just a short-term view but first of all a long-term focus is needed (Dewey 1930 cited in Campbell 1995, 192). According to Dewey there is but one sure road of access to truth – the road of patient, cooperative inquiry operating by means of observation, experiment, record and controlled reflection (Dewey 1934 cited in Campbell 1995, 104).

Dewey advocates the importance of focusing upon the relationship between ends and means. According to him the distinction between the instrumental and the final adopted in philosophic tradition as a solving word presents in truth a problem, a problem so deep-seated and far-reaching that it may be said to be *the* problem of experience (Dewey 1925: 1929 cited in Campbell 1995, 122). For Dewey, then, it is not that the means justify the ends, but that *the means (i.e. reflective and progressive inquiry) are the ends*[161] (Dewey 1916: 1997; Glassman 2001; Campbell 1995).

[160] Dewey's use of the term "melioristic" is derived from James's use of it to emphasize the possibilities and the need for our efforts to attain them (Campbell 1995, 261; cf. James 1890: 1950, vol 1 and 2.)

[161] Cf. George Herbert Mead, cited in Campbell (1995, 62: "the human social animal has acquired a mind, and can bring to bear upon the problem his own past experiences and that of others, and can test the solution that arises in his conduct. He does not know what the solution will be, but he does know the method of the solution").

How then does the reflective inquiry proceed according to Dewey? Before entering in the Deweyan process of inquiry, his conception of experience needs to be analyzed. Dewey makes a distinction between primary and secondary experience (Dewey 1925: 1929; Dewey 1934: 1980; cf. Campbell 1995; Miettinen 2000a). Primary experiences are the gross, everyday activities in life that have consequences. Primary experience occurs continuously, because the interaction of a live creature and the environing conditions are involved in the very process of living (Dewey 1934: 1980, 35). More fundamentally, primary experience is an unanalyzed totality (Dewey, 1925: 1929, 10-11) and a living reality of experience prior to the separation of the subject and the object.

A secondary experience is a reflective experience that makes the environment and its things objects of reflection and knowledge. As examples of secondary experience Dewey offers the objects of both science and philosophy, objects like theories, equations and intellectual conventions (Campbell 1995, 72). According to Dewey there needs to be a relationship between primary and secondary experience – it has a dual nature (Dewey 1925: 1929, 7; cf. Engeström 1987, 223; Miettinen 2000a, 68). The ordinary role of secondary experience is to *explain* the meaning of primary experience – it enables us to grasp the primary objects with *understanding*, instead of just having sense-contact with them (Dewey 1925: 1929, 7; Campbell 1995, 73). It seems to be obvious that the Deweyan scheme comes close to the double hermeneutic stance of Giddens and Habermas (cf. chapter 2).

Dewey tries to modify the ancient scheme of experience holding individuals tightly within a given order subordinate to its structure and patterns by emphasizing our inner experiences and individual capabilities to make a contribution – to modify *structures* and *culture*. (Dewey 1925: 1929, 143; Miettinen 2000a, 70; Campbell 1995, 68; cf. also Kolb 1984, 1)

If then experience has a dual nature as proposed by Dewey, it is unjustified to reduce it to just individual and psychological phenomena (Miettinen 2000a, 70-71; cf. Olson 2003, 126) leading us finally towards the "hands-on" fallacy (Bereiter, 2002[162]). However, the interaction between our daily primary experiences and "records" of previous cultural accomplishments needs to be understood.

[162] For an alternative point of view about this issue cf. e.g. Bransford, Brown & Cocking eds. (2000, 132/133). According to them two notions of knowledge were identified by Dewey: first, "records" of previous cultural accomplishments and engagement in active processes as represented by the phrase "to do". Consequently, to emphasize "to do" is not equivalent to "hands-on".

Dewey described our social situation as follows:

> ..experience is already overlaid and saturated with the products of the reflection of past generations and by gone ages. It is filled with interpretations, classifications, due to sophisticated thought, which have become incorporated into what seems to be fresh, naïve empirical material[163] (Dewey 1925: 1929, 34; cf. Miettinen 2000a, 63).

As Dewey added,

> It would take more wisdom than is possessed by the wisest historic scholar to track all of these absorbed borrowings (prejudices) to their original sources.. but intelligent furthering of culture demands that we take some of them off, that we *inspect them critically* to see what they are made of and what wearing them *does to us*. (Dewey 1925: 1929, 34–35)

Having analyzed the Deweyan conception of experience it comes possible to enter his interpretation of the process of inquiry. Dewey has presented his conceptions of reflective thinking and learning (reflective and progressive inquiry) most clearly in his works on thought and logic: *How we think* (1910: 1933; especially pages 102-118) and *Logic: The Theory of Inquiry* (1938: 1991; especially pages 105-122)[164]

For a start let us imagine that we are drifting (wondering, day dreaming or even consciously aiming to do something). In a way we are continuously experiencing until we meet a perplexing situation:

> When a situation arises containing a difficulty or perplexity (the situation is the indeterminate situation), the person who finds himself in it may take one of a number of courses. (Dewey 1910: 1933, 102; Dewey 1938: 1991, 111[165]).

When choosing to face the situation he begins to reflect. But when choosing not to face the situation he refuses to reflect. So the

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[163] Cf. chapter 2 and the Cussinsian cognitive trails, being stabilized but sometimes in a need for destabilizing acts.

[164] Miettinen (2000a) adds also Dewey's *Essays in Experimental Logic* (1916) which is not analyzed here. Cf. also Campbell (1995, 47) for additional reading about the Deweyan process of inquiry.

[165] Jarvis (1992, 70-85) gives (cf. Jarvis 1987) a more elaborated analysis of the nine possible types of responses to an experience grouping them into three overarching categories: nonlearning (presumption, nonconsideration, rejection), nonreflective learning (preconscious learning, skills learning, memorization) and reflective learning (contemplation, reflective skills learning and experimental learning). Cf. also Schein (1993).

reflection is not an automatic consequence of a perplex situation but an example of human intentionality. To see that a situation requires inquiry is the initial step in inquiry (Dewey 1938: 1991, 111), but on the other hand an individual can easily follow his habituated ways of doing things even in a perplex situation.

The real opposition is not between reason and habit but between routine, unintelligent habit, and intelligent habit or art (Dewey 1922 cited in Campbell 1995, 125). The main difference between unintelligent and intelligent habit lies between *incoherent* or *coherent consequences of habits* (or misaligned or aligned consequences of habits)[166]. In general intelligent habits tend to have coherent consequences, and therefore we tend to sustain them even when not aware of them. Intelligent habits are useful to us because they free the mind for a higher order of thinking. (Dewey 1938: 1991, 20; Dewey 1916: 1997 cited in Campbell 1995, 46)

On the other hand, habits can be unintelligent and have control over us (Dewey 1922, cited in Campbell 1995, 124). Custom is for social life what habit is for individual life and we can be seen as prisoners of our customs and habits (Dewey 1910: 1933 cited in Campbell 1995, 124; Dewey 1916: 1997 cited in Campbell 1995, 44). The shift Dewey has in mind is a shift from unintelligent habits and customs to intelligent habits and customs achieved by reflective inquiry. Dewey has defined inquiry as follows,

> Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole. (Dewey 1938: 1991, 108)

When describing his logic of reflective thinking Dewey tries to avoid the three main mistakes most characteristic of the history of logic. One of these is highly relevant in this phase because logical theory is quite often liberated from the unobservable, transcendental and "intuitional" (Dewey 1938: 1991, 107). When contemplating the analyses of Dewey's reflective thinking made by James Campbell (1995, 47–51) and Reijo Miettinen (Miettinen 2000a, 65–67; cf. Tuomi 1999, 309) a question asked by Dewey comes to the fore: "Is the doubt put

[166] In this study the concept of coherence is replaced by the concept of alignment, although metaphorically speaking the phenomenon is the very same. It is argued that one key characteristic of human thought is the human beings' tendency to search for explanatory coherence and unification (cf. e.g. Hakkarainen, Palonen, Paavola & Lehtinen 2004, 156; Thagard 1992). Hence, coherence is suitable for psychological analysis and alignment refers more or less to societal and organizational features.

to "productive use"" (Dewey 1929 cited in Campbell 1995, 101, 148) and is it justifiable to forget "intuitional" aspects of human beings?

Dewey has mentioned that the sequences of reflective thinking (five phases; Dewey 1910: 1933, 1938: 1991[167]) are not fixed and in some (or all?) situations a look into the future, a forecast, an anticipation, or a prediction, should be included as a first phase of an inquiry process (Dewey 1910: 1933, 115-117). Hence, the Deweyan model has five phases driven by a social human being acting in a future-oriented manner.

The moment a person begins to reflect, he necessarily begins, alone or with someone, to observe in order to form "the facts of the case" as Dewey explains our actions in the middle of the indeterminate situation (Dewey 1910: 1933, 103; Dewey 1938: 1991, 113). But how and from what kind of perspective are we looking at our indeterminate situation and could we be aware of our perspective? Dewey refers to this fundamental issue in the following manner:

> When we look back at earlier periods, it is evident that certain problems could not have arisen in the context of institutions, customs, occupations and interests that then existed, and that even if, *per impossible,* they had been capable of detection and formulation, there were no means for solving them. If we do not see that this conditioning, both negative and positive, exists at present, the failure to see it is due to an illusion of perspective. (Dewey 1938: 1991, 481–482; quoted in Wertsch 1998, 40–41)

A further point that emerges is that the constraints imposed by cultural tools are typically recognized only through a process of comparison from the perspective of the present. Consequently, it is usually only with the appearance of new, further empowering and constraining forms of mediation that we recognize the limitations of earlier ones. (cf. Wertsch 1998, 40) By conscious efforts we can partly develop the way we see situations and influence what will be *possible* to see and inquire. In an indeterminate situation, a person making a reflective inquiry about starting needs to be aware how he is influenced by social structures. At the same time he has a possibility to act as a

[167] In How we think (1910: 1933) these five phases are 1) suggestions, 2) intellectualization of the difficulty into a problem, 3) collection of factual material guided by a leading idea or hypothesis, 4) the mental elaboration of the idea and 5) testing the hypothesis by overt or imaginative action. In Logic: The Theory of Inquiry (1938: 1991) Dewey focuses more on the uncertain, unsettled, disturbed and indeterminate situation. Miettinen (2000a; cf. also Tuomi 1999) defines these five phases as 1) disturbance and uncertainty: habit does not work, 2) intellectualization and definition of the problem, 3) studying the conditions of the situation and formation of a working hypothesis, 4) reasoning and 5) testing the hypothesis in action.

knowledgeable agent with all human capabilities (e.g. anticipating, using his intuitive capabilities and making suggestions (Dewey 1910: 1933, 103–108)) in the comparative learning process.

Imagine that you are acting in an indeterminate situation where some perplexities have just emerged. You have decided to reflect on the situation at hand, anticipating some courses of action. Undoubtedly, the situation rather often demands progressive inquiry with the help of experts, some methods and techniques (cf. Dewey 1938: 1991, 108).

It is a familiar, and according to Dewey, also a significant saying that *a problem well put is half-solved* (Dewey 1938: 1991, 112). To find out *what* the problem and problems are which an indeterminate situation presents to be inquired into, is to be well along in the inquiry. To make a mistake about the problem involved is to make the subsequent inquiry irrelevant or to go astray (Dewey 1938: 1991; quoted in Campbell 1995). Hence, the importance of well-put problems can not be overemphasized while the inquirer continues his inquiry process.

Observation of facts and suggested meanings or ideas arise and develop in correspondence with others:

> Some observed facts point to an idea that stands for a possible solution. This idea evokes more observations. Some of the newly observed facts link up with those previously observed and are such as to rule out other observed things with respect to their evidential function. The new order of facts suggests a modified idea (or hypothesis) which occasions new observations whose result again determines a new order of facts, and so on until the existing order is both unified and complete. In the course of this serial process, the ideas that represent possible solutions are tested or "proved" (Dewey 1938: 1991, 117).

In the end of the analysis of the Deweyan way of thinking it seems to be useful to link these ideas to the present situation at the FNDC. For the teachers at the FNDC, struggling along the dimension between the possibility and the impossibility of the influential developmental efforts or for the managers struggling with the case of controllability and uncontrollability of the educational transformation, the melioristic faith exemplified by Dewey seems to offer one of the needed props: "Specific conditions which exist at one moment, be they comparatively bad or comparatively good, in any event *may be bettered*". Secondly "a problem well put is half-solved". For a potential learning organization, as the FNDC, the fixing of the unbroken is obviously a

needless activity. For a start the personnel of the FNDC have to have courage and an organizational climate allowing authentic problems to be put on the table in an open discussion. When this becomes possible, fundamental questions (i.e. well put problems) rather than secondary ones can to be discussed.

The third Deweyan prop is the idea of the means and ends. Using Meadian words to explain the Deweyan idea this prop could be formed as follows: "We do not know what the solution will be, but we do know the method of the solution". The needed method is the progressive inquiry scrutinized also by Dewey. When seeking solutions to our current research problems we cannot stop here, but have to continue our path of inquiry by the following cognitive trails.

8.4. Levels and loops of learning based on Bateson

Along the journey to find the most fruitful learning theories it is time to introduce the learning theories of Gregory Bateson (1904-1980). It is essential to know more about his theories before entering the analysis of the learning theories of Chris Argyris, Donald Schön and Yrjö Engeström. The intent is to introduce the basic ideas and concepts of Bateson's learning theories and how the above mentioned scholars have used them in their own research.

In chapter 4, when analyzing the theories of Nonaka, cybernetics was discussed. Now these theories come again to the fore, as the roots of Bateson's learning theories lie partly in cybernetic theories. According to Bateson, all biological and evolving systems are homeostatic, i.e., the effects of changes of input[168] will be negated and the steady state maintained by *reversible* and *hierarchic* adjustments. All evolving systems need *adaptation* and *flexibility* in order to live and exist (Bateson 1972, 273–274).

Gregory Bateson (1972, 293) divides learning (adaptation) into five hierarchical levels. Zero learning is a label for non-corrective behaviour. Learning I is a label for the revision of choice (response) within an unchanged set of alternatives. It is equivalent to the formation of unconscious operations in the course of simple adaptation to existing external conditions (cf. Leont'ev 1981, 237; Engeström 1987, 145). In Learning II the set of alternatives is unconsciously revised. In other words the system learns to learn (deutero-learning). Learning III means change in the process of *revising the set of alternatives* in Learning II.

[168] According to Ashby (1956), disturbances.

Learning III is motivated by the resolution of the *contradictions* or *double binds* of Learning II. On level III the individual learns to change consciously the habits acquired by Learning II. According to Bateson Learning IV is a "theoretical label" because probably it does not occur in any adult living organism on this earth.

Chris Argyris and Donald Schön (1974, 1978) distinguish two levels of behavioural learning: single-loop and double-loop learning (Argyris & Schön 1974, 18; cf. Ashby 1956). In single-loop learning we act according to a set of alternatives, but in double-loop learning we can learn to change our *governing variables*. There is no need to reduce Bateson's learning levels to the loops proposed by Argyris and Schön, but despite of that it seems interesting to compare these views and try to understand the transition from single-loop (cf. Learning II unconsciously) to double-loop (cf. Learning III consciously) learning.

What are then the necessary ingredients for a double bind situation maybe making the transition from single-loop (cf. Learning II) to double-loop learning (cf. Learning III) to happen? According to Bateson (1972, 206-207) a double bind needs two or more persons, repeated experience, some contradictive injunctions (primary, secondary and tertiary) [169] until the set of these ingredients can be learned by the individual in question. Bateson offers a useful example to clarify the double bind situation with a story of a Zen master and his pupil,

> The Zen master attempts to bring about enlightenment in his pupils in various ways. One of the things he does is to hold a stick over the pupil's head and say fiercely, "If you say this stick is real, I will strike you with it. If you say this stick is not real, I will strike you with it. [Then what may the student do in this "what do you do if you "cannot" do anything situation?] The Zen pupil might reach up and take the stick away from the master. (ibid, 208)

In this example the Zen master offers some hints about the proper set of alternatives but the pupil does not act according to ready-made alternatives; he solves the double bind by revising the available set of alternatives, as the purpose of the Zen master was. The very nature of the pupil's actual and indeterminate situation seems to evoke inquiry for the potentials of the situation (cf. Dewey 1938: 1991, 109) accelerated by the intentionality of the pupil.

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[169] Also Argyris and Schön have for a long time proposed that in all kinds of organizations people are familiar with double bind and contradictive situations. They describe these as a no-win game where the rules (governing variables) of the game are *undiscussable* (Argyris & Schön 1978, 118, 121–123).

Yrjö Engeström has developed the double bind concept further and defines it as follows:

> A double bind is a social, societally essential dilemma which cannot be resolved through separate individual actions alone – but in which *joint co-operative actions* can push a historically new form of activity into emergence (Engeström 1987, 165; italics added).

What kind of relation may there exist between double binds and contradictions and do the human needs and intentionality play some role in this game? Engeström explains that to him the double bind is the psychological and experienced counterpart of the secondary contradiction of the activity (Engeström 1987, 188–189, 322).

Being already familiar with Engeström's view on contradictions (cf. chapter 4), it needs to be reminded that the theoretical analysis of contradictions is also a wider sociological phenomenon. According to Giddens the concept of contradiction is an indispensable one in social theory, and his proposal is to use it in two senses (Giddens 1984, 193, 197, 373): that of "existential contradiction" and that of "structural contradiction". By existential contradiction he refers to an elemental aspect of human existence in relation to nature or the material world (cf. the famous Cartesian split). Structural contradiction refers to the constitutive features of human societies where structural principles operate in terms of each other, but yet also contravene each other (e.g. the necessity to cooperate while competing). But in all kinds of societies the suppression of existential questions and problems cannot be wholly complete. Indeed, they are fundamental to the structural contradictions of capitalism.

Giddens argues that the primary contradiction of the capitalist (nation-)state is to be found in the mode in which a "private" (an individual) sphere of "civil society" is created, but is separate from and in tension with the "public" (a social) sphere of the state (Giddens 1984, 197). Contradictions tend to emerge because of divisions of interests between different groupings or categories of people, but there exists something more fundamental. For example the sociologists Raymond Boudon (1982) and Jon Elster (as well as Giddens) associate contradiction with the unintended consequences of action[170]. Contadictory consequences ensue when every individual in an aggregate of individuals acts in a way which, while producing the intended effect if done in isolation, creates a perverse effect if done by everyone[171] (Giddens 1984, 311).

[170] The unintended refers to the phenomenon that is partly but not fully anticipated in advance.
[171] As a clarifying example can be seen the officers of the FNDC acting according to the "static warrior premises", the societal consequences being unintended and perverse ones – unadaptability to the local and global culturally evolving conditions.

Here it is argued that the key to understanding the roots of "existential contradiction" lies in the conceptualization and understanding of the human being. Does he have a relatively free will and intentionality and to what extent are his actions determined by social structures? Further on it seems to be essential whether his *sphere of interest* is a narrow individualistic not considering the effects of his actions on others or not (cf. Boudon 1982, 153–205).

It seems to be intrinsic to us as humans to be curious in order to live. Because we are fundamentally social beings, the admission of this prerequisite seems to be more appropriate than ever. Traditionally we tend to see the extension of human conscious control over nature, but it is a logical impossibility e.g. when remembering our unknown unconsciousness and its coefficient consequences. A fundamental shift of view seems to be needed and the main question is not what needs to be changed in the public sphere but ultimately how to improve our private sphere (ourselves) in order to act more responsibly in the public sphere. If this curiosity emerges in the public sphere it is a proof of human intentionality and need to act according to some *collective purpose*. But even then the collective can not control the whole system without most of us controlling ourselves. How do we personally activate and solve our double binds while facing societal contradictions? In this process the individual has a relationship with the world and both actively generate each other (Engeström 1987, 163) while solving their existential contradiction.

It needs to be added that the individual double binds need to be taken into account, but this has to be done in concert with organizational contradictions. In a sense there is an intrinsic tension between individual double binds and social contradictions. The capability to solve one's own double binds in the public sphere implies an individual source of energy for the movement (i.e. development) of the activity system. On the other hand contradictions cause[172] some social self-movement of the activity system. In other words, these consequences emerge partly because of human intentionality but partly because of "unintended" consequences in the public sphere.

Chris Argyris and Donald Schön give us an illuminating example about the inner contradictions of a bureaucratic organization (Argyris & Schön 1978, 120–123; in Engeström's terms secondary contradictions).

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[172] In chapter 3 this argument was set against the question posed by Larry Cuban (1999): "How to explain the identified stability in the midst of several contradictions?" Here it seems to be useful to be reminded of the set of alternatives possible for the individual human being in question: nonlearning (presumption, nonconsideration, rejection), nonreflective learning (preconscious learning, skills learning, memorization) and reflective learning (contemplation, reflective skills learning and experimental learning) (Jarvis, 1987, 1992). But on a societal level the causes of contradictions are fundamentally a matter of time and how we understand the root causes of the societal change.

According to them designers of organizations tend to think hierarchically about the organizations, just as they think hierarchically about complex problems in general. In order to minimize the organization's loss and maximize its gains, complex tasks (the mini-max strategy) have to be broken down into relatively simple ones and grouped for ease of recognition and control. The resulting specialization of work, with its associated pyramid, appears to the designers to make it easier to find people, educate them to the requirements of the organization, and manage them.

The inner contradictions arise from the fact that the mini-max strategy is used on individuals, forgetting their individual potentials. The forgetting is even more lethal when understanding that both the external environment and the internal environment of the organization demand continual reflection and monitoring to meet the various challenges (e.g. "chaos"; complexity; requisite variety; information overflow)

As mentioned above, in order to have double-loop learning we should make our undiscussable governing variables (beliefs, values; root causes; principles and even basic premises) into discussable ones and change them consciously (a shift from Model I theories-in-use to Model II theories-in-use). Based on several decades of field studies Chris Argyris and Donald Schön argue that all people tend to use the same theory-in-use (actual rules in use) especially when facing embarrassment or threat. On the other hand people have a wide scale of espoused theories of action, but they are not necessarily governed by them (cf. e.g. Griseri 1998).

The shared governing values (variables) of Model I theories-in-use are: define goals and try to achieve them (define goal and purpose alone; be a strong leader), maximize winning and minimize losing (changing them would be a sign of weakness), minimize generating or expressing negative feelings (permitting others to express their feelings tends to be seen as a poor strategy) and be rational (the counterpart to minimize feelings value) (Argyris & Schön 1974, 66-67, 1978, 61). These shared values will be challenged during this analysis in the reverse order (cf. chapter 8): could it be possible that instead of rational decision makers we are more or less arational or occasionally even irrational actors? Is it possible that feelings play some role in our decision making system? Is it possible that instead of "win-lose" games we could have "win-win" games, finally understanding how dependent our success is of the vitality of the whole network? How well defined and shared goals do we as "rational" decision makers have?

Governed by the above mentioned values people tend to adopt some general action strategies: design and manage the environment

unilaterally, own and control the task, unilaterally protect yourself and unilaterally protect others from being hurt (Argyris & Schön 1974, 1978). Carrying out these action strategies effectively leads to a paradox. The paradox is that implementing these strategies requires *other people* to act ineffectively by the very terms of Model I. But as mentioned, by challenging the governing values and variables of the dominant Model I theories-in-use we could cause some changes in our habituated ways to act.

In the process of organizational learning the individuals should be guided by the governing values of Model II theory-in-use: valid information, informed choice, and responsibility to monitor how well the choice is implemented (Argyris 1990, 104). In organizations, conditions for error tend to exist but by corrective responses, guided by Model II values, the solution of the paradoxical situation can be found (cf. e.g. Argyris & Schön 1978, 59). Consequently, organizational theories of action could be restructured.

In chapters 6 and 7 the intent was to take the governing variables under discussion while tacit features were converted into an explicit form with the aim of revising the current habituated sets of alternatives at the FNDC. The revision can be done by other alternatives progressively sought by social scientific research.

Interestingly, the question of contradictions allows us to see the looming question of an appropriate sphere of interest. If contradictions can be seen to play an essential role in our learning processes, could the sphere of interest (or field of vision) restrict or enable us to feel the double binds and contradictions? In a way the widened sphere of interest increases the amount of potential contradictions and double binds, consequently potentially accelerating the research process and learning[173]. Hence, the crucial question seems to be whether we continue to focus on trees instead of forests. This question is especially important to the agents dealing with human security issues. What kind of a role contradictions play and how we otherwise conceptualize our perspective on the societal change, will be clarified later.

The analysis suggests that the resolution of individual double binds and social contradictions enables the transition towards qualitatively higher levels of learning to happen. This *potential* transition is a concrete phenomenon involving continuous movement from operations to actions to activity – or vice versa (cf. Engeström 1987,

[173] According to the Peter Senge, Otto Scharmer, Joseph Jaworski & Betty Sue Flowers (2005) two types of learning can be identified. Both types of learning seem to be a real possibility and the main difference between these types of learning is the *depth of awareness* and *the consequent source of action.*

154, 163; Leont'ev 1981) during learning activities (cf. chapter 4). At this phase the Leont'evian three-level scheme can be linked to the chosen learning theories and to the human dimension as presented in **figure 8.2**.

Human Dimension	Leont'ev (1978)	Bateson (1972)	Argyris, Schön (1974; 1978)
DISTRIBUTED MIND AND INTELLIGENCE	ACTIVITY/ MOTIVE	LEARNING III	DOUBLE-LOOP LEARNING
CONSCIOUS AWARENESS	ACTION/GOAL	LEARNING II	SINGLE-LOOP LEARNING
BEHAVIOURAL HABITS	OPERATION/ CONDITIONS	LEARNING I	SINGLE-LOOP LEARNING

Figure 8.2 Leont'evian three-level scheme linked to the chosen learning theories
Source: Cf. Engeström 1987, 154.

In the Age of Innovations it is crucial to understand how these innovations are made on all the Leont'evian levels. It is even more interesting to recognize that above the Leont'evian levels there is a "fourth level" playing an ever-increasing role also in innovations (cf. Tuomi 2004; Hamel 1996[174], 2000[175]).

The "fourth level" is justifiable when remembering that all activity systems are mediated by both material and psychological tools (i.e. concepts). Some special activities, for example the social scientific

[174] Hamel (1996) emphasizes radical innovations instead of incremental innovations, insisting that in any industry there are the rule makers who occasionally rewrite the rules of the game to others to follow. Hamel gives some principles of the industrial revolution and one of these is the needed new perspective to look at the industry's conventions and the revolutionary *ideas.* Undoubtedly the meaningfulness of ideas has run through the social scientific thinking since Plato with his realm of pure ideas separate from human knowledge (cf. e.g. Bereiter, 2002, appendix for a short introduction into the issue; for further readings see Russell, 1946; James, 1890: 1950, vol 1 and 2).

[175] For a figurative example see Tuomi (2002); von Hippel & von Krogh (2003); von Hippel (2005) about the idea of open source software programming presenting a novel, successful and transformative alternative to conventional innovation models. Cf. also Wood & Hamel (2002); Rigby & Zook (2002) about the centrality of *ideas* in our current Age of Innovations.

research, produce concepts (e.g. the Nonakaian knowledge assets or Bereiterian conceptual artifacts) to be used in other activities as mediators. This means that to some extent these activities (both the initiator and end-user activities) are *guided* by these concepts, and consequently we can say that the meaningful "fourth level" emerges above the Leont'evian three level scheme.[176] Consequently, continuous movement between the four levels is a necessary but not sufficient condition for transformational learning.

8.5. Expansive learning

According to Yrjö Engeström, the expansive learning cycle begins with individual subjects questioning the accepted practice, and it gradually expands into a collective movement or institution (Engeström 1999a). The expansive cycle or spiral is achieved through specific epistemic or learning actions as follows:

- The first action is that of questioning, criticizing, or rejecting some aspects of the accepted practice and existing wisdom.
- The second action is that of analyzing the situation. One type of analysis is historical-genetic, seeking to explain the situation by tracing its origination and evolution. Another type of analysis is actual-empirical, seeking to explain the situation by constructing a picture of its inner systemic relations.
- The third action is that of modelling the newly found explanatory relationship in some publicly observable and transmittable medium. This means constructing an explicit, simplified model of the new idea that explains and offers a solution to the problematic situation.
- The fourth action is that of examining the model, running, operating, and experimenting on it in order to fully grasp its dynamics, potentials, and limitations.
- The fifth action is that of implementing the model, concretizing it by means of practical applications, enrichments, and conceptual extensions.
- The sixth and seventh actions are those of reflecting on and evaluating the process and consolidating its outcomes into a new, stable form of practice. (Engeström 1999a[177]; Tuomi 1999).

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[176] It needs to be recognized that also the other levels of the Leont'evian scheme are influenced by the conceptual production on a third level. For example new kind of concepts may cause some consequences on the level of actions (i.e. influencing individual human beings; giving new kind of "mindsets", "angles" and ways to see thinks).

[177] In Engeström (1987) the expansive cycle is explained to have five epistemic actions: questioning, analyzing, modeling, applying and consolidating-reflecting; cf. Toiviainen (2003).

Now it is possible to put some flesh on the Engeströmian bones when being reminded of the experiences gained through the Development Laboratory meetings (cf. chapter 6). From the very first meeting the intent of the researcher was to focus on the accepted educational practices at the FNDC. The aim was to criticize the current educational practices and enable the participants to do so, but not to fix the unbroken. As presented, to some extent the societal questioning and criticizing began in the meetings[178] despite of the overall tendency to throw the hands up and feel the overwhelming impossibility to have some developmental influence on the FNDC as a whole.

When analyzing the situation of the FNDC, the researcher traced the origins and evolution of the military educational system and identified two key paradoxes – the university-scientific versus military organization paradox or the USMO paradox, and the Soldier's Basic Paradox. It was argued that these paradoxes and the latent secondary contradiction[179] could cause different kinds of manifestations to emerge in the FNDC, as was shown in chapter 7.

Thirdly a new kind of model of *military innovativeness* was shown to the participants of the Development Laboratory meetings and also to the interviewed managers of the FNDC. The example of an individual teacher producing an educational innovation, the learning log, to the FNDC was an exemplary one. The example was actually only one in a long string of educational innovations already made in the departments of the FNDC waiting to be distributed into the whole FMES.

One way out of the problematic situation was shown to be the emphasis on shared authentic values. The espoused value of expertise played and still plays a pivotal role in this process. If then the FNDC is espousing how highly it values expertise, it has to develop some methods to identify what will be labelled as "good" or "bad" expertise and how it will be possible to help the expertise of the teachers and researchers of the FNDC to flourish. The idea of valuing teachers' expertise was concretized in the form of the Teacher's Self-Evaluation Sheet. In other words the sheet allows the teachers to explicitly grasp their personal ideas about the good expertise of military training and education.

It seems to be possible that at some phase in the future this kind of *potentially expansive* process will turn into an authentically expansive learning process[180]. While the history of the FNDC helps to uncover the contradictions and potentials of the activity system of the FNDC,

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[178] Cf. The excerpts of chapter 6.
[179] Between the subject (the individual teacher) and the community.
[180] During the research process for example the Change Laboratory Method was included in the written curriculum of the Cadet Courses.

it does not tell us how these contradictions are to be resolved (cf. Engeström 2004c, 156) – this duty has been left to the personnel of the FNDC. In chapter 7 it was argued that these paradoxes and the identified secondary contradiction seem to be made into a solvable form along the identified key educational dimensions. But before that we have to put our doubt on the productive use: Is the development of our teachers' "core competencies" (i.e. action competence) necessary and if it is, how can it be done without individually and socially reflecting on the current practices at the FNDC?

Back to the theoretical debate. Engeström's expansive learning cycle seems to be related to Dewey's sequences of reflective thinking. Both Dewey and Engeström see that in the beginning the learner starts to question the habituated ways of doing things. This point implicitly gives another relevant alternative for us: to not learn and stick stubbornly to our habituated ways of acting despite of some changes in the environment (i.e. the area of operations). From some justifiable angle the normal course of actions can be potentially disturbed, needing to be fixed. It is questionable to what extent a problem emerges without any human awareness of the problem. As emphasized above, a problem well put is half-solved and a problem needs to be mentally elaborated and societally justified in order to get a status – *the authentic societal problem or the fundamental problem.*

As the empirical research shows, social emergence is not any automatic and self-evident happening. As Peter Jarvis (1987, 28–36, 1992, 70–78; cf. e.g. Schein 1993) has explained, types of responses to an experience include also nonlearning (presumption, nonconsideration, rejection) and nonreflective learning (e.g. preconscious learning and memorization). Referring to Bateson, the shift from unconscious Learning II to conscious Learning III is a crucial one and the transition needs a human "touch" or otherwise it does not happen. Referring to the studies made by Argyris and Schön, the transition from single-loop learning to double-loop learning can be done socially, making the governing variables *discussable* and taking them under close scientific scrutiny. On the other hand, referring to the studies made by Engeström, the dominant role of the quaternary contradictions of our global knowledge society can be emphasized emerging from the various kinds of consequences of our actions and activities.

8.6. The social theory of learning

The research made by Jean Lave and Etienne Wenger (1991; Wenger 1998) is included in the present scheme (cf. chapter 4) as a representative of the fifth generation of CHAT. As explained above, CHAT has been evolved by synthesizing the original individualistic tendency of Vygotsky to the social tendency of Leont'ev. In his foreword to *Situated Learning* (1991) by Jean Lave and Etienne Wenger, William F. Hanks argues that Lave and Wenger have "located learning squarely in the processes of coparticipation, not in the heads of individuals" (Lave & Wenger 1991, 13). But actually Lave and Wenger do not mean that when focusing on learning we should forget heads if analysing how *whole persons* learn *while participating* in the activities of social communities. Lave and Wenger actually emphasize that it is significant to shift the analytical focus from the individual as a learner to learning as participation in the social world – but without loosing sight of the head, or more hopefully of the whole participating person in the world.

Lave and Wenger have developed the concept *legitimate peripheral participation* (LPP) to serve as a conceptual bridge between processes changing persons and changing communities of practice. By this they mean to draw attention to the point that learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community. Later when extending the analysis, Etienne Wenger (1998, 12) gave the spotlight, instead of LPP, to the identity and community of practice in his social theory of learning. In a way the concept of communities of practice developed by Lave and Wenger offers a balancing stick for us wavering between individual and social structures; in other words it guides us how to live in the middle (Wertsch 1998).

According to Wenger we do not have one but two dimensions to waver between. In his analysis Wenger develops a social theory of learning to be located *at the intersection* of intellectual traditions along two main axes, as illustrated in **figure 8.3** (Wenger 1998). Wenger introduces several dualities as opposed of dichotomies because both these aspects are always present to some degree (Wenger 1998, 66; cf. Giddens 1984, 30).

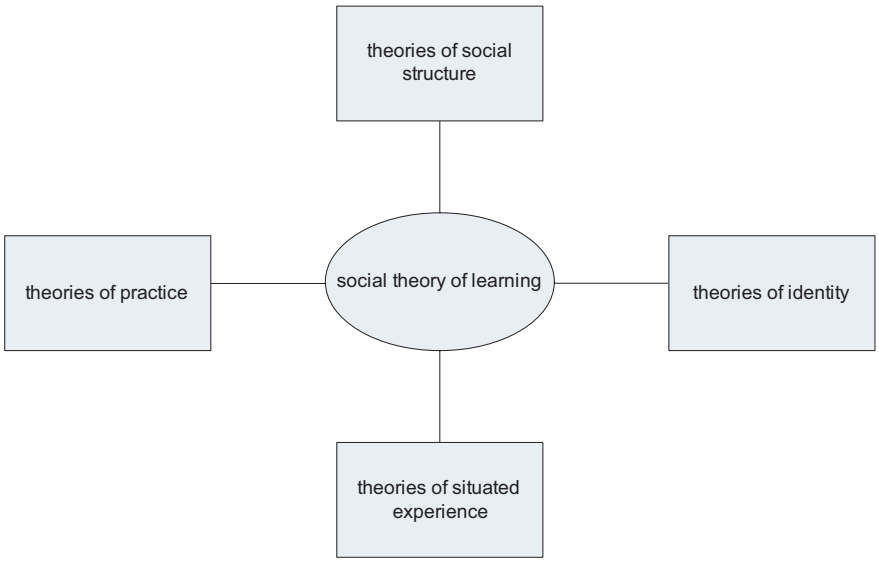

Figure 8.3 The position of the social theory of learning in the field of social sciences
Source: Wenger 1998, 12.

In the tradition of social theory, the vertical axis is a central one. It reflects a tension between theories that give primacy to social structure (social determinisms) and those giving primacy to action (interactionist paradigm) (Wenger 1998; cf. Giddens 1979, 1984; Boudon 1982).

Obviously Wenger avoids "the normal lack of grounding in genuine social theory" (Berends, Boersma & Weggeman 2003, 1038) but mere sociological grounding is not an appropriate solution[181] if the answer is the mechanistic determinism of institutions over individuals and our current situation in the world over ourselves as being socially autopoietic (Luhmann 1995). In his theory of social learning Etienne Wenger rejects the radical pessimism of some forms of postmodernism (Wenger 1998, 297) by releasing an individual human being from "the slavery"[182] of existing structures, although giving to him a shared responsibility of this all.

Giddens identifies four different mechanisms of social change (Giddens 1990b, 304–305[183]; Mingers 2003): *system reproduction* – the

[181] In the field of pedagogically oriented research David Olson (2003) gives such an example in his analysis of educational reform by locating his analysis strongly in the Durkheimian tradition.
[182] In this context "the slavery" is rather strongly used as a metaconcept instead of non-meaningfulness, misalignment et cetera.
[183] Cf. Giddens (2001, 42-46) where he argues that we can identify three main factors that have consistently influenced social change: the physical environment, the political organization and cultural factors (i.e. effects of religion, communication systems, leadership and *ideas/ideals*, and science (i.e. the emergence of "rational" or critical modes of thought). According to Sennett (1998, 30) "change" tends to mean just "drifting" without any long term planning in our contemporary societies where "corrosion of character" often seems to be the fact.

incremental and unintended drift of social practices; *system contradiction* – conflicts of interests within and between social systems; *reflexive appropriation* – conscious shaping of social systems by often radical interventions; and *resource access* – changes generated by changing availabilities of resources. Individual actors play a dominant role in these changes even to the extent that without human agency human societies or social systems would plainly not exist. But actors do not create social systems: instead they reproduce or transform them, remaking what is already made in the continuity of praxis (Giddens 1984, 171).

Naturally the FNDC can be seen to be under continuous system reproduction by the unintended cultural drift of social practices[184]. At the same time the FNDC is in the midst of conflicting interests between military organizations and scientific universities. Hence the emergence of the USMO paradox, as explained in chapter 7. The reflexive appropriation is a real potentiality for the FNDC but when following the Giddensian line of sociological thinking, as Wenger has done, human active contribution to the improvement of social structures cannot be taken for granted. According to Giddens (1984, 9), agency refers not to the intentions people have in doing things but to their capability of doing those things in the first place. Hence, an agent could openly interact or lack interaction, being in every case the perpetrator of the intended and unintended consequences of action. But curiously the current state of organizational silence at the FNDC can be caused by the otherwise knowledgeable teachers being unaware of the unintended consequences of the lack of interaction on the widening spheres between departments, between divisions of the FNDC and between the national and international military educational institutions.

Also the fourth Giddensian mechanism for social change needs to be highlighted – changes generated by changing availabilities of resources. In our age the expansion of available key resources seems to be a fact, at least when considering the mere availability of the raw substance for *the* resource of our age (i.e. knowledge), which consequently accelerates the pace of the global change processes.

In the midst of the information overflow and turbulences of our social landscape it needs to be recognized that according to Wenger (1998), education, in its deepest sense and at whatever age it takes place, concerns the opening of identities – exploring new ways of being that lie beyond our current state. Issues of education should be

[184] According to Senge (1990, 22) the greatest danger of all for us is the drifting caused by gradual change, ourselves being unaware of it. To avoid these kinds of dangers the sphere of interests, the question of time frames, possibilities for societal reflections and for example of the overall purpose comes to the fore.

addressed first and foremost in terms of *identities* and *modes of belonging* and only secondarily in terms of skills and information. Consequently, according to Wenger, learning is not a pure skill and an information accumulation process but a continuous process of becoming or "not becoming" and missing the "right" position on the social landscape. For the personnel of the FNDC these ideas hopefully mean for example continuous negotiations about identities[185], showing the formative or even transformative potential of the education for those organizations seeking to sustain their vitality also in the future.

The main principles of the social perspective of learning may be summarized by the following list (emerging questions have been added),

- Learning is inherent in human nature: it is an ongoing and integral part of our lives – how about social learning or organizational learning?
- Learning is first and foremost the ability to negotiate new meanings and it involves our whole person.
- Learning creates emergent structures (cf. communities of practice) – does the lack of these emergent structures mean that the potentialities have not turned into actualities, needing active agents to set the system into motion?
- Learning is fundamentally experiential and fundamentally social; learning can be defined as a realignment of experience and competence, whichever pulls the other – learning could potentially offer means to cure the misalignment currently identified at the FNDC.
- Learning transforms our identities.
- Learning constitutes trajectories of participation in a process of individual and collective becoming – but interestingly also non-participation is needed.
- Learning means dealing with boundaries (between activity systems and communities) – between the schooling and the workplace; between the military and civilian spheres of interests; between the military science and the social science; between the national and international military educational institutions.
- Learning is a matter of social energy and power.
- Learning is a matter of engagement and imagination (a reflective practice).
- Learning is a matter of imagination.

[185] Some tentative topics to be discussed can be offered: "What does it mean to be a "good teacher"?" "The national officer as an international collaborator in the human security activities – maybe having Euro-Military Identity?" (cf. e.g. Royl 2002; 2004); "The officer as a teacher-as-researcher at the FNDC?" (cf. e.g. Toiskallio ed. 2004, 112); "Is our ultimate aim to win the next battle or war or instead of facing new kinds of security threats by configured means?" (cf. e.g. Toiskallio 2002, 8)

– Learning is a matter of alignment.
– Learning involves an interplay between the local and the global (cf. Wenger 1998, 226–228).

For the personnel of the FNDC the notion of identity[186] seems to emphasize the needed multimembership and consequently brokering across boundaries between practices. Interestingly Wenger sees the multimembership as a critical source of learning. By these multimemberships the personnel of the FNDC could potentially use the world as a resource as well as to be a resource for others especially in the same field of human security activities.

When focusing on the crucial boundaries of practices, the brokers[187], boundary encounters and boundary practices have to be taken to the fore (Wenger 1998, 108-121; cf. Burt 1992). Human agency seems to be needed for effective brokering and fruitful boundary encounters, enabling ongoing mutual engagements to happen, and finally the emergence of boundary practice. Consequently the essentiality of the brokering done by individual actors is balanced by the collective brokering practices (cf. Sverrison 2001[188]).

For the FNDC this means that it has to be aware of the current individual brokers (or alternatively of *bridge builders)* in action, but on the other hand it has to enable new kinds of boundary practices to emerge. The FNDC needs to focus on the solving of the Soldier's Basic Paradox as well as the USMO paradox because the individually made solutions to these paradoxes play an essential role in the processes of constituting and sustaining the identities of the officers of the future. On the other hand the continuous modifications of identities happening between the civilian and the military security institutions seem to be a potential source of learning for the FNDC.

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[186] Later when analyzing the progressive-inquiry learning model proposed by Hakkarainen, Lonka, and Lipponen (2004) the notion of identity has been brought to the fore mainly referring to the analysis made by Holland, Lachicotte, Skinner, and Cain (1998) (cf. Hakkarainen et al. 2004, 218). Holland with his disciples identify two approaches on identity: A culturalist and an opposing constructivist interpretation. Their perspective puts these interpretations together in a dialogic frame (Holland, Lachicotte, Skinner & Cain 1998, 9–15). Referring to Wenger (1998, 151) Toiskallio (2002, 113) explains how identity is a way of being in the world and who we are lies in the way we live from day to day, not just in what we think or say about ourselves.

[187] According to Peter Monge and Noshir Contractor (2003, 143) the social role of brokers was first introduced into sociology by Georg Simmel (1955) with the concept of the *tertius gaudens*, which translates literally as "the third who benefits".

[188] Sverrison distinguished three approaches to knowledge brokering: networking brokerage (bridging otherwise separated people; cf. chapter 6), knowledge-oriented brokerage (bridging and translating theoretical conceptions and approaches; cf. the present study) and brokerage of organizational or technological novelties (cf. chapter 6). Cf. also Hakkarainen, Palonen, Paavola & Lehtinen (2004, 77); Tuomi-Gröhn & Engeström eds. (2003); Engeström, Engeström & Kärkkäinen (1995).

It needs to be recognized that boundary crossing is a difficult and tension-laden action and activity (Wenger 1998). An example of the military scientific researcher offers a useful clarification to the point. Communities define themselves by contrast to others – military officers versus civilians, practitioners versus researchers. To the military scientific researcher this could mean being marginalized as an officer and as a teacher while the big picture of the social landscape is neglected due to lack of researchers and interests to do so. At the moment the FNDC is modifying this kind of big picture and locating itself in the social landscape of the globalizing world while answering the crucial questions as follows: what do we attempt to know and understand and what do we choose to ignore? With whom do we seek connections when trying to understand these issues?

After the social landscape is simplified to an understandable form to be collectively scanned, the personnel have to face the complexity of the brokering and bridge building activities. This involves processes of translation, coordination, and alignment between perspectives. The bridge builders play a pivotal role in the process, being not just intruders of the outer practices (cf. Wenger 1998) but accelerators of the organizational learning processes.

The process of alignment bridges time and space to form broader enterprises so that the participants become connected through the coordination of their energies, actions, and practices. Through alignment, we become part of something big because we do what it takes to play our part in the identified social landscape (Wenger 1998, 179). By turning misalignment into alignment we can amplify our power and our sense of the possibilities – in a way turning the impossible towards possible.

In the field of educational studies John Biggs (2003) has famously elaborated the meaning of alignment. According to him alignment, or constructive alignment, means that the critical components to be aligned and balanced are the curriculum, the teaching methods, the assessment procedures, the climate with the students and the institutional climate (the rules and procedures we have to follow) (Biggs 2003, 26; cf. Hakkarainen et al. 2004, 312; Lindblom-Ylänne & Nevgi eds. 2003, 253–254).

8.6.1. Communities of practice as emergent social properties for learning and alignment

The concept of communities of practice can be seen as a balancing stick for us wavering between for example our individuality and social structures, and in boundary areas between different kinds of activity

systems. In the case of communities of practice it needs to be recognized that although the concept has been developed among the researchers of the cultural-historical activity theory, it has been cross-appropriated[189] (cf. Spinosa et al. 1997) to the field of knowledge management. Hence, when focusing on the concept we could recognize how the relationship with learning and knowledge creation takes shape.

If and when we share the intent to understand both theoretical and practical aspects of the communities of practice-concept we have to be aware of its historical roots, because only this way the concept can be understood (Engeström 2001a; Vygotsky 1978). This point reminds us about the Vygotskyan core principles, namely, the example of reliance on genetic, or developmental, analysis. Genetic-developmental analysis in Vygotsky's approach is motivated by the assumption that it is possible to understand many aspects of mental functioning only if one understands their origin and the transitions they have undergone (Wertsch 1991, 19; Wertsch 1985, 14–15).

According to Wenger, McDermott, and Snyder (2002, x) the field of knowledge management has gone through three waves[190]. The first wave emphasized technology and codification strategy[191]. The second wave focused on behaviour, culture, and tacit knowledge[192]. Now the third wave has turned its attention to communities of practice[193] providing a concrete organizational infrastructure for realizing the dream of a learning organization. It can be asked whether it could be realizing also the dream of a knowledge creating organization, and what the relationship between communities of practice and *Ba* is (cf. chapter 4).

Communities of practice are not a universal silver bullet to ever lasting success, although in the field of knowledge management theories and practices they are often understood as such. They are not meant to replace teams or other organizational constellations as structures for production and services. More than silver bullets they could be seen as tools to bring the principles of organizational learning into the social reality (Wenger 1998, 85; Wenger, McDermott & Snyder 2002, x, 14; Allee 2003, 123–124).

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[189] By cross-appropriation they mean bringing practices into contexts that could not generate them, but in which they are useful; cf. also Engeström, Engeström & Kerosuo (2003); Engeström (2004b). Cf. reflexive appropriation as a mechanism for social change (Giddens 1990b).
[190] cf. Ahonen, Engeström & Virkkunen (2000); Tuomi (2002).
[191] Hansen, Nohria & Tierney (1999); Edvinsson & Malone (1997); Stewart (1997); Sveiby (1997).
[192] cf. Nonaka & Takeuchi (1995); Polanyi (1966) about tacit knowledge.
[193] Lave & Wenger (1991); Wenger (1998); Allee (1997, 218–219); Allee (2003); Davenport & Prusak (1998, 38–39). The concept of communities of practice has already been cross-appropriated to the Armed Forces. Kilner (2002); Brown (2003). For more information, see companycommand.com and squad-leader.com.

Although communities of practice do not offer a straight road towards everlasting success, they have been seen to offer *potentially* some key benefits:

- Help people to do their jobs.
- Help people to better understand what others are doing in the organization.
- Be an effective filtering mechanism to deal with "information overflow" and need for continuous problem solving.
- Foster a learning-focused sense of identity.
- Speed response to the claims and feedback of customers.
- In the midst of continuous change offer an effective tool for organizational adaptation, learning and innovations.
- Help people to build a common language, narratives, and models.
- Provide means to share power and influence with the formal parts of the organization.
- Be representatives of communal memory and a "living knowledge base" (i.e. embed expertise) allowing knowledge to "stick" in the organization.
- Offer a required variety for the organization operating "in the midst of a wide variety" (i.e. complexity, "chaos").
- Be tools for recruiting.
- Be tools for boundary management and boundary crossing between separately situated units.
- Improve business outcomes. (Wenger, McDermott & Snyder 2002; Saint-Onge & Wallace 2003, 49–50; Allee 2003, 122; Brown & Duguid 2001; Millen, Fontaine & Muller 2002)

The concept of communities of practice challenges us to self-reflect on the questions below and "climb" up to the metatheoretical and philosophical level:

- Nature of change: temporal or a continuous process?
- Mechanistic (e.g. a hierarchy) versus organistic (e.g. a human network) perspective?
- Centralized (hierarchic) versus decentralized structures?
- Top-down versus bottom-up approaches to organizational issues?
- Control versus social autopoiesis[194]?
- Conception of a human being: passive versus active, or "a master" or "a marionette"?[195]
- Conception of knowledge: product versus process?
- Formal versus informal structures?

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[194] Maturana & Varela (1980).
[195] Allee (2003, 41–43); Wenger, McDermott & Snyder (2002); Saint-Onge & Wallace (2003).

The analysis made by Lave and Wenger (1991) is an example of the current need to shift our thinking from "either-or" type to "both-and" type of dialectical thinking[196] because thinking in terms of complex dualities rather than mere dichotomies is needed when focusing on their theories and our practices.

The concept of community of practice was originally used to characterize socialization practices in certain relatively stable cultures (Ahonen, Engeström & Engeström 2000; Hakkarainen, Palonen, Paavola & Lehtinen 2004) as among Yacatec Mayan midwives in Mexico, among Vai and Gola tailors in Liberia, in the work-learning settings of U.S. navy quartermasters, among butchers in U.S. supermarkets and among "nondrinking alcoholics" in Alcoholics Anonymous (Lave & Wenger 1991). To what extent these cultures are as stable as argued is discussable, but nevertheless the concept has been seen as relevant to the modern "dynamic" world (cf. e.g. Bereiter 2002; Brown & Duguid 1991, 2001; Dierkes, Berthoin Antal, Child & Nonaka 2001; Tuomi 1999, 2002; Hakkarainen, Palonen, Paavola & Lehtinen 2004).

The idea of communities of practice challenges the traditional view to see social practice as fundamentally stable, stressing that change is a fundamental property of our social reality[197]. Because of this fact the main point is not how to initiate change processes but how to support these processes, and metaphorically speaking, how to use human energies intentionally in order to achieve something socially valued.

The main mechanism of change for the communities of practice emerges when newcomers aiming to master significant knowledge and skills are trying to move toward full participation in the sociocultural practices of a community. Metaphorically speaking and simplifying a little bit, novices could be seen as "moving" toward full participation and the status of a master (an expert) while both they and the practices involved change (Lave & Wenger 1991). The novices are for the communities of practices a vital source of new knowledge and experiences, facilitating the development of the community (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 78). The novices are also sources for challenging questions, offering often fresh angles to the old routines.

The duality of stability and change is applicable also to the trajectory of learning in a community of practice. Both the masters and the newcomers are passengers in a drifting boat, namely practice. To some extent they are rowing and deciding where they are heading to but

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[196] Lave & Wenger (1991, 38, 102, 123); Wenger (1998, 66). Some cognitive trails to dialectical thinking were shown in chapter 4.

[197] Cf. an interesting analysis made by Tsoukas and Chia (2002).

to some extent they are just carried by the stream. Consequently, a real master or a real expert cannot rest on his laurels but has to keep going and learning. And when a community always has several kinds of tasks at hand and jobs to do, everyone can to some degree be considered a newcomer to the future of a changing community (Lave & Wenger 1991, 117[198]).

Communities of practice are more organic entities than "simple mechanic" ones, resembling the difference between living and non-living entities (Wenger, McDermott & Snyder 2002, 12–13). The use of organic metaphors is justifiable because they seem to make more sense when focusing on human issues. This fact does not mean that communities of practice exist without any mechanical features (e.g. habituated routines).

Practitioners have dual roles as both community practitioners (informal) and operational team members (formal). This role duality means a "double-knit" structure or even a "triple-knit structure" (a hypertext organization) where the knowledge-base layer completes the triple structure[199]. To the practitioner this variety of roles causes a need for shifting dynamically between these contexts, and the ultimate purpose is to reap benefits from all of these layers.

The most successful communities of practice thrive where the goals and needs of the organization *intersect* with the passions and aspirations of the participants (Wenger, McDermott & Snyder 2002, 32). Such a community of practice and its members stand at the intersection of two dominant strands of social relations. One strand is inside the organization (the value chain) but the other extends beyond the organization along the network of practice (Brown & Duguid 2001, 206).

If then the communities of practice could be even consciously cultivated, how to effectively help them flourish? The first skill of community development seems to be a capability to "see" them (Wenger, McDermott & Snyder 2002, 24) and so we have to define what we are actually looking for. As a starting point it is useful to define communities of practice:

> Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their *knowledge* and *expertise* in this area by interacting on an ongoing basis. (Wenger,

[198] According to Hakkarainen, Palonen, Paavola and Lehtinen (2004, 60) the border between a student (a novice) and a full member (a master) of an expert community in peripheral participation is not so well defined as it has been in traditional professional and academic communities.

[199] Wenger, McDermott & Snyder (2002, 32), a "double-knit" organization; Nonaka & Takeuchi (1995, 160–196), a hypertext organization.

McDermott & Snyder 2002, 4; cf. Saint-Onge & Wallace 2003, 33; Allee 2003, 116)

Quite often communities of practice emerge in a bottom-up manner when a group of experts have started to meet informally to explore their common passion. Communities of practice can also be deliberately created in a top-down manner but then there is a great danger of a possibility to kill them by overemphasizing the control. (Wenger, McDermott & Snyder 2002; Saint-Onge & Wallace 2003)

As noted above, communities of practice have quite often just autopoietically emerged without any purposeful social control or management activities. The concept of *autopoiesis* refers to the research of two Chilean biologits (Humberto Maturana and Fransisco Varela) who tried to understand how a living system comes into being. Under some proper natural conditions biological (or even social[200]) systems are generated *spontaneously*, making themselves by themselves through interaction with their environment (Maturana & Varela 1980, 95). But can social systems be autopoietic (cf. Mingers 2003; Bailey 1994, 309-322[201], 1997) and what is the nature of social change?

The system typology developed by John Mingers (1997) is a useful tool for finding the way out of the ambiguous and continuous debate over the issue. In his nine-level typology Mingers gives the levels one to three to non-living systems and four to nine for living or transcending systems (the God)[202]. For the purposes of this study the *nature of interaction* between level 7 (observing systems, human beings) and level 8 (social systems) is crucial to understand.

Social systems (level 8) are according to Mingers characterized by relations of structural coupling between organisms of level 7 (e.g. human beings). By structural coupling Maturana and Varela (Maturana & Varela 1992, 75) mean the history of recurrent interactions leading to structural congruence between two (or more) systems. The crucial point is the question about the nature of the interactions - recurrent or non-recurrent?[203]

[200] cf. Luhmann (1995).

[201] Cf. the questionable uncontrollability belief of the third paradigm of the systemic thought; see **figure 4.3**.

[202] Mingers (1997, 303–313). The crucial point is the fact that although these levels are *interconnected* they are at the same time *separate,* seemingly resisting reductionist explanations. Gilbert Ryle (1949, 16–17) spoke about the nowadays widely spread *category mistake* meaning that "applying concepts to logical types to which they do not belong should be abandoned". A weaker version of this statement states that we should at least be aware of this cultural tendency when making our judgements (cf. also Maturana & Varela 1980, 1992; cf. Tuomi 1999, 192-200; Polanyi 1966, 35-36, 85; Argyris & Schön 1996, 193).

[203] According to Kenneth Bailey (1994, 113) social system analysis focuses on *relationships between units of analysis rather than on "separate" units* (cf. e.g. individual human beings and communities).

As often mentioned, the first skill of community development is to be able to "see" them, but they could be also enabled by following some key principles such as the ones below:

- Invite different levels of participation (who is real expert/master and who is not yet; different roles of the participants) to the shared domain.
- Design for evolution: "design a little, implement a lot".
- Open a dialogue between inside and outside perspectives.
- Develop both public and private community spaces.
- Focus on value.
- Combine familiarity and excitement (stability vs. excitement).
- Create a rhythm for the community. (Wenger, McDermott & Snyder 2002)

Developing domain, community, and practice together is a balancing act; each element requires a distinct kind of developmental attention and work. At the same time, the three elements interact, and it is their interplay that makes a healthy community (Wenger, McDermott & Snyder 2002, 46). If the domain of a community fails to inspire its members, the community will flounder; or it does not even emerge in the first place. Moreover, if the topic lacks strategic relevance to the organization, the community will be marginalized and have limited influence (Wenger, McDermott & Snyder 2002). The crucial question for all kinds of communities of practice is how valued its expertise is for the larger community and what the community can do in order to get others to value its expertise.

If the community in question seems to be in need of cultivation, defined roles seem to play a pivotal part in the process. The roles of the communities of practice can be loosely grouped by three key elements needing to be balanced: domain (area of expertise; what do they know?), community (who are they? I.e. leader and sponsor roles) and practice (what do they do? Knowledge intermediary and supporting roles). (Wenger, McDermott & Snyder 2002; Allee 2003; Fontaine 2001; cf. Saint-Onge & Wallace 2003)

The above analysis was made mainly from the perspective of a local community of practice and when thinking dialectically, as Lave and Wenger have done, we have to shift our view to the global perspective. In this phase the analysis made by Engeström (2004b) is a relevant one. According to him processes of learning may be differentiated along two key dimensions, one representing the given versus newly emerging nature of the object and activity to be mastered, the other one representing the distinction between exploitation of existing knowledge versus exploration for new knowledge (cf. March 1991:

1996; Crossan, Lane & White 1999; Sutter 2002; Engeström 2004b; Hakkarainen, Palonen, Paavola & Lehtinen 2004, 120)

If the concept of communities of practice enables us to understand how the newcomers tend to be socialized and taught to embody the given, it does not fully explain how novel ideas are developed cross-appropriating[204] them globally (Spinosa et al. 1997) - how else than just dealing with practically and researching scientifically (i.e. inquiring progressively) the current ill-defined problems of our natural and social reality?

8.7. Progressive inquiry learning

Kai Hakkarainen and his colleagues have developed a pedagogical model of progressive-inquiry learning. The model relies on cognitive research on educational practices and is closely associated with the knowledge building approach of Marlene Scardamalia and Carl Bereiter (1993; Bereiter 2002) and Jaakko Hintikka's interrogative model of inquiry (Hintikka 1999).

The model is well aligned with Dewey's social pragmatism, with cultural-historical activity theories (e.g. Engeström, Wertsch, Lave, Wenger) and with the other prominent thinkers of the Knowledge Age (e.g. Nonaka) claiming that a new paradigm for investigating human intelligent activity is emerging (Hakkarainen, Palonen, Paavola & Lehtinen 2004). In a way the progressive-inquiry model tries to be a metatheoretical synthesizer of the current social scientific research in the field of organizational learning and knowledge creation. The explicit purpose is to outline an approach that makes it possible to develop the modern educational system in a way that will help students to develop skills and competencies that allow productive and meaningful participation in the emerging knowledge society (Hakkarainen, Palonen, Paavola & Lehtinen 2004, x).

In order to answer to the challenges of the knowledge society, there must be fundamental change in the whole pedagogical *philosophy* of the educational system (Hakkarainen, Palonen, Paavola, Lehtinen, 2004, 4; cf. e.g. the analysis of the Deweyan philosophies and also other analyses made on the metatheoretical and philosophical level in this study) towards constructive alignment, understanding, and a new kind of activity – the knowledge creating activity.

The main strategy for creating the synthesis, used by Kai Hakkarainen and his colleagues, is to re-interpret and combine social

[204] Or reflexively appropriating (Giddens 1990b, 304).

scientific research from three *combinatorial perspectives* (metaphors of learning): the knowledge-acquisition, the participation and the knowledge-creation perspectives (Hakkarainen, Palonen, Paavola & Lehtinen 2004; Hakkarainen et al. 2004). It appears to be advisable to examine these perspectives simultaneously at several "ontological" levels: individual (i.e. the acquisition metaphor), community (i.e. the participation metaphor), and organization (i.e. the knowledge-creation metaphor) (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 14)[205].

The present study favours, instead of using multiple metaphors, paying attention to the systemness of our reality. The identified perspectives, or metaphors, are actually combinatorial, being interconnected but at the same time resisting reductionist explanations[206]. The main point is not to choose the "right" one but have them all while making interpretations of complex social systems.

Although the progressive-inquiry model sheds light into the essence of human nature, here the knowledge-acquisition perspective is generally passed[207], starting with the participation perspective and firstly focusing on the concept of innovative knowledge communities (IKCs). In the previous subchapter some criticism made by the researchers of progressive-inquiry learning against the concept of communities of practices was already shown in the analysis, and its justifiableness needs to be tested once more.

Metatheoretically speaking, the dialectical thinking done by Lave and Wenger needs to be remembered as disturbing the insisted stability of the communities by the continuous change processes within them. Hakkarainen, Palonen, Paavola and Lehtinen (2004, 139–147) explain how IKCs emerge in our current knowledge societies. In a way they are deliberately modifying the zone of proximal development for the traditional communities of practice by explaining how the most capable peers confront present problems[208]. When doing so the main focus is

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[205] Cf. also parallel arguments favoring multilevel analysis of organizational learning; Rauste-von Wright, von Wright & Soini (2003, 34-38, 106); Kim (1993); Schein (1993); Crossan, Lane, White & Djurfeldt (1995); Crossan, Lane & White (1999); Toiviainen (2003); Knight (2002); Bereiter (2002). Cf. the idea about the epistemological infrastructure of the knowledge intensive organization, Hakkarainen, Palonen, Paavola & Lehtinen (2004, 209).

[206] According to Sfard (1998) too great devotion to one particular metaphor (or an approach or a perspective) can lend to theoretical distortions and to undesirable practices (cf. also Cobb 1994; Cobb & Yackel 1996). Even from the knowledge-acquisition perspective instead of metaphors we should focus on the systemness of our human processes (Neisser 1994; Sternberg 1990; Damasio 1994). The ancient idea that cognitive processes can be partitioned into two main families – traditionally called *intuition (i.e. System 1)* and *reason (System 2)* – is now widely embraced under the general label of *dual-process theories* (Kahneman & Frederick 2002; Sloman 2002; Stanovich & West 2002).

[207] Despite of this, some additional explanations especially from the knowledge-acquisition perspective will be shown in the notes. See claimed dangers of neglecting the knowledge-acquisition perspective, Sfard (1998); Anderson, Reder & Simon (1996, 1997); Gorodetsky & Keiny (2002); Bereiter (1997, 2002).

[208] Not well-defined routinized problems but ill-defined problems in our current reality.

not on the actual but on the potential means to enable the needed transformation. When comparing traditional communities of practice (COPs) and innovative knowledge communities, some justified differences will be sought.

When examining the relations between traditional COPs and IKCs along the dimension "exploitation of old - exploration of new", it can be argued that the traditional COPs often do not tolerate very much exploration of new ideas, tending to disapprove of participants who cross the boundaries of their practices. Sometimes, apprentices are prevented or even prohibited from developing novel ideas. In many cases, new practices do not emerge until the old masters have passed away, and the rate of change is never very high (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 141). But the duality of stability and change is applicable also to the practices of traditional COPs. Consequently both the masters and the newcomers are passengers in a drifting boat, namely in practice. Therefore, both COPs and IKCs can have a collective responsibility for the cognitive growth (cf. Hakkarainen, Palonen, Paavola & Lehtinen 2004, 146) of the participants while exploring new fields of the societal landscape.

By emphasizing exemplary IKCs it is possible to show, also to the traditional COPs, that the mere exploitation of traditional knowledge is not enough (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 142) if aiming to manage in the midst of increasing complexity, information overflow and deepening global interconnectedness. Thus, more exploration is needed even if one aims to "stand still" or sustain stability in the social reality.

The nature of the networks in the traditional COPs can be quite different from what it should be in the IKCs. Traditionally, also in the case of the FNDC, the importance of strong ties between participants of the community has been recognized, causing an effect of general neglectance of systematic external connections (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 146). Strong ties, but also weak ties are crucial success factors in the present global environment (Granovetter 1973; cf. Hansen 1999; Monge & Contractor 2003, 147–149). To the organizations aiming to be learning organizations the connections, and expecially the nonredundant[209] connections (Lin 2002, 68–69; Monge & Contractor 2003, 148), need to be systematized and deliberately extended.

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[209] Nonaka emphasises the centrality of redundant information but this could be understandable when focusing on the issue from the angle of the individual worker: redundancy of information helps organizational members understand their position by letting them see themselves from the outside (cf. chapter 4). On the other hand nonredundancy is essential when looking at the environment from the organization. Hence "the inside redundancy" is comparable to "the outer nonredundancy".

Resource heterogeneity is, however, only one criterion of better information. According to *the prestige principle*[210] (Laumann 1966 in Lin 2002, 69), individuals prefer to associate with others of a somewhat higher social status. In our knowledge intensive society this means that experts are often selected following the prestige principle. In the case of science the aim could be to get more explanatory power (cf. chapter 2).

By IKCs Hakkarainen, Palonen, Paavola and Lehtinen (2004, 145) highlight that in the present knowledge society there is an increasing amount of such a communities whose main motive of collective activity is knowledge creation. IKCs are deliberately advancing and developing mediating conceptual artifacts and ultimately aiming at conceptual changes and understanding of individuals, but also at social advancement by locally accelerated cultural learning[211] (Hakkarainen, Palonen, Paavola & Lehtinen, 2004, 145; Hakkarainen et al. 2004, 20, 252, 339).

IKCs, but also traditional COPs (Wenger, McDermott & Snyder 2002; Saint-Onge & Wallace 2003), are often deliberately designed to capitalize on cognitive diversity; new members are, in many cases, intentionally picked to complement existing knowledge and expertise (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 144). By cognitive diversity Hakkarainen et al. refer to a rather similar issue as the requisite variety emphasized by Nonaka (cf. chapter 4), but interestingly with concepts of psychology and social psychology[212] instead of ones cross-appropriated from the field of cybernetics or from natural sciences in general.

Since the emergence of the Deweyan social pragmatism and Meadian symbolic interactionism, the proper solutions to our current problems have not been identified, but at least there has been a shared

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[210] For instance the Google search engine prioritizes the results of a search on the basis of the network *prestige score* associated with each Web site. In order to identify other key principles for emergence see Giddens (1984, 207-226); Monge & Contractor (2001, 2003); Sawyer (2001). Monge and Contractor (2001, 487) claim that the time may come to explore a more eclectic, multitheoretical approach to predict communication network behaviour and outcomes. While seeking this, *mutual self-interests* or even *mutual interests,* of *the knowledgeable actors* come to the fore while we are balancing our activities along the dimension between the exploitation of the old and the exploration of the new.

[211] Accelerated cultural learning refers to the metaphor of the ratchet coined by Tomasello (1999, 39). The metaphor of the ratchet in this context is meant to capture the fact that imitative learning (with or without active instruction) enables the kind of faithful transmission that is necessary to hold the novel variant in place in the group so as to provide a platform for further innovations. Cf. chapter 6 of the ratchet effect at the FNDC partly caused by the learning log and other military pedagogical innovations put into practice.

[212] Cf. chapter 4 where the importance of the link between knowledge management and organizational sensemaking studies was stressed. Especially the cognitive trails made by Karl Weick were shown (Weick 1995, 2001; Weick & Sutcliffe 2001) to be valuable ones.

awareness of the *method of the solution.* Ever since inquiry has been emphasized as the "right" method for solving problems.

Recently this idea has been modified in the form of progressive-inquiry learning (**figure 8.4**) (Hakkarainen, Palonen, Paavola & Lehtinen 2004; Hakkarainen et al. 2004; Hakkarainen, Bollström-Huttunen, Pyysalo & Lonka 2005).

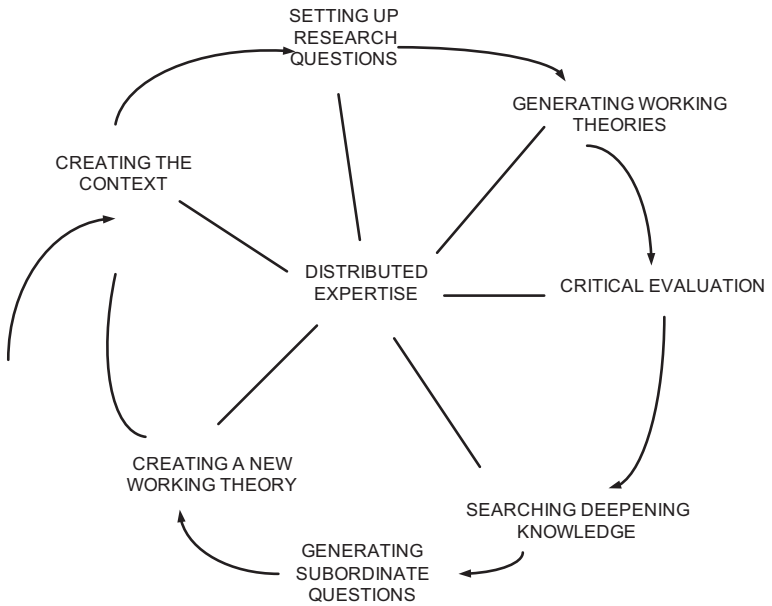

Figure 8.4 The progressive-inquiry learning model
Source: Hakkarainen, Palonen, Paavola & Lehtinen 2004, 197.

According to Bereiter (2002), students learn from practical activities only those things they practice[213]. The idea has been named *Bereiter's Razor*[214] by Hakkarainen and his colleagues (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 181). For the progressive inquirers this point gives different kinds of meanings, depending on the focal point of analysis[215]. The individual learner need not just learn but learn to learn.

[213] It is sometimes argued that the progressive-inquirers neglect the importance of learning "know-how" or skills so essential for the successfulness of the Armed Forces. But as a counterargument the various cognitive trails of the learning of skills in the research of progressive-inquirers need to be recognized (see Hakkarainen, Palonen, Paavola & Lehtinen 2004). For further progressive inquiries see e.g. Sun, Merrill & Peterson (2001); Dienes & Perner (1999); Anderson (1995). It could be reasonably hypothesized that the identifiable cognitive trails play a significant role also in this phenomenon.

[214] Cf. the famous Occam's Razor meaning that "entities are not to be multiplied without necessity". According to Bertrand Russell William of Occam did not say this but something which has much the same effect, namely that "it is vain to do with more what can be done with fewer" (Russell 1946, 435).

[215] Cf. the knowledge-acquisition, the participation, and knowledge-creation perspectives, respectively.

Often these kinds of skills are called metaskills or metacognitive skills, for example the skills of critical self-reflection or epistemological skills.[216]

Bereiter's Razor means also to the individual student that if all his resources are needed in the future in all kinds of workplaces at the FDF and at the FBG he needs to learn to *use them while learning.*

The starting point for the process of inquiry is the joint creation of a context for the project in question. Through creating a context, the issues being investigated are connected with deep principles of the knowledge domain in question, and anchored in authentic and complex problems of the external world, or issues that the participants genuinely wonder and care about. (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 197)

For the disciplines of the FNDC this means reevaluation of the relationship and dimension between the disciplines and the organizations of the FDF and the FBG, because complex and authentic problems are situated in the field, influenced by complex local features (Brown, Collins & Duguid 1989; Hakkarainen, Palonen, Paavola & Lehtinen 2004, 199; Hakkarainen, Bollsröm-Huttunen, Pyysalo & Lonka 2005, 90) potentially already known by the students coming from the field units.

An essential aspect of progressive inquiry is generating the participants' own sense of problems and questions to guide the inquiry (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 197). As already recognized when analyzing the learning theories from Dewey to Engeström and finally to this model, all the models emphasize the centrality of problems in the learning process. In a way without problems no deep learning but just superficial learning exists[217].

Paradoxically those practices for which people should be educated today *do not exist yet* (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 203). For the FNDC this means that it cannot solely focus on the present problems in the field but has to pay attention also to problems of the future. The FNDC is practically shaping the future of the FDF and the

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[216] According to Olson (2003) pedagogy is largely responsible for children's epistemological development and consequently their learning the normative practices of the disciplines. In part this development consists learning to make systematic linguistic distinctions such as that between theory and *evidence* and between causes and *reasons* (Olson 2003, 81) but also rhetorical skills to persuade one's community (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 208–212; cf. Ceccarelli (2001) on how science can be seen partly shaped by rhetoric. Cf. also Toulmin (1990, 187) about the rise of rhetorics in contemporary societies.)

[217] For quantitative meta-analysis of the effects of problem-based learning see Dochy, Segers, Bossche & Gijbels (2003). It can be hypothesized that potentially the effects of progressive-inquiry learning will exceed the effects of the problem based learning (PBL) due to the elaborated theory and metatheory (philosophical and logical reconsiderations on a practical level; cf. Hintikka (1999).

FBG, and the visionary future state of the FNDC has to guide its educational activities[218]. The FNDC does not or at least should not just receive the visionary end state from the Defence Staff but should actively participate in the process of making a vision and a knowledge vision.

When creating a context for the disciplinary progressive inquirers, the FNDC has to systematize and extend its connections to national and international expert cultures because the dynamic development of expertise is fundamentally dependent on participation in an expert culture[219]. Only through these kinds of connections can the FNDC get an appropriately deep understanding of the deep principles of the knowledge domain and spheres of life in question[220]. In our age of deepening global interconnectedness, separateness of the "civilian" and "military" worlds cannot be justified and the emerging contradictions need to be faced rather than hidden under the carpet.

As explained in chapter 2, the relationships between scientific researchers and teachers (or lay actors in general) need to be carefully evaluated. The social scientist, double hermeneutically operating at the intersection of two frames of meaning[221] needs to balance the participation in the social scientific and lay expert cultures during the inquiry process. Similarly an individual teacher needs to balance his participation in the sphere of research and the sphere of work (i.e. teaching) and life.

The progressive inquiry process is driven by questions (especially by fundamental questions) and also aimed at conceptual change, and especially increased understanding of the participants. The question about conceptual change brings to the fore the issue of different kinds of perspectives and units of analysis. To what extent is it possible and how justifiable is it to re-interpret the research findings of the knowledge acquisition perspective from situational or sociocultural perspectives? The question is much more crucial than merely academic because its answer strongly influences the availability of the researched facts in the social sciences[222].

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[218] In a parallel manner also the visionary end state of the FBG has to guide the educational activities of the FNDC.

[219] This does not mean solely military experts but also civilian experts as well.

[220] Cf. chapter 2 about the deep principles of the scientific sphere of life, chapter 4 about the deep principles of the chosen research programmes, and chapter 7 about the Soldier's Basic Paradox explaining some deep principles of the military sphere. Cf. also the issue of identity in this chapter.

[221] The social scientific worldview (i.e. research programmes and theories) and the lay actors' worldview.

[222] Cf. Lave (1988, 170-190); Hutchins (1995, 370–372); as a case example cf. Vosniadou (1991, 1994, 2002); Schoutltz, Säljö & Wyndhamm (2001); Ivarsson, Schoultz & Säljö (2002); Hakkarainen et al. 2004, 97–98; Neisser 1994, 227.

The analysis presented here favours the *balancing* emphasis of changing mental models in the head (i.e. "mind"; how he perceives things) of the individual on the deepening understanding of understanding (Bereiter 2002), aiming to create a new form of practical activity (Ahonen, Engeström & Virkkunen 2000, 291). At the FNDC this kind of new kind of activity could be labeled as knowledge creating activity (see chapter 9).

As mentioned in chapter 4, in institutionally situated activity, like schooling, spontaneous and scientific concepts develop at the same time – spontaneous concepts proceed from concrete to abstract and abstract scientific concepts to the concrete level (cf. Vygotsky 1978). In this process scientific concepts grow downward through spontaneous concepts and vice versa in the process of interacting conceptual systems[223]. Hence the system of scientific concepts is needed to enable the gradual change of spontaneous concepts. For the schooling activities this means for example mind-mapping activities (cf. Hakkarainen et al. 2004, 165–168; Hakkarainen, Bollström-Huttunen, Pyysalo & Lonka 2005, 138–154).

By posing questions the inquirer can convert his tacit knowledge into an explicit form (e.g. working theories), allowing the student to become aware of the possible dilemmas and incoherencies between his interpretations and cultural knowledge. In this "phase" collaborative discussions have a crucial role due to the fact that in the explicit form the individual interpretations could be societally elaborated, enabling sustainable conceptual changes to happen. (Hakkarainen et al. 2004, 282; Hakkarainen, Palonen, Paavola & Lehtinen 2004, 198; Hakkarainen, Bollström-Huttunen, Pyysalo & Lonka 2005, 47)

The empirical research done at the FNDC (cf. chapters 6 and 7) shows that it needs to be emphasized that the organizational silence or over-individualistic practices are a real hindrance for fruitful progressive inquiry learning processes, but it can be overcome for example by contacts with other expert communities where open discussions are traditionally experienced as an essential part of successful activities. Other means are also needed and hence human means for social change are needed – a new kind of leadership in the practices of the FNDC[224].

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[223] Cf. analysis in chapter 4 about the Engeströmian extension of this interpretation (i.e. horixontal movement).

[224] What is "good" or "not so good" leadership is a more fundamental question than the difference between e.g. transformational and transactional leadership. In other words it is a metatheoretical question. Practically this means that also the FNDC has to progressively and continuously inquire into the depths of "goodness" of the leadership of its personnel while aiming to solve the Soldier's Basic Paradox.

Instead of focusing solely on the problem of the conceptual change the problem of understanding[225] deserves more attention when seeking a solution to the problem of the ultimate outcome of the schooling. This point is not a new phenomenon; it has been an important candidate for this position since John Dewey (Olson 2003, 145). It seems reasonable to say that obviously to understand is something more than just a subjective "ah-ha" feeling, but how do we socially justify understanding and what kind of criteria do we need for that?

Understanding is often understood as a precondition of intelligent action (Bereiter 2002, 112) just as an intelligent action is often an indication of understanding. What about, then, a student who acts "intelligently" but does not know why he does so? Obviously to act intelligently and effectively is not the same as to understand.

At this phase it is necessary to have a closer look at the secrets of understanding, and John Biggs provides an interesting tool for that with his SOLO taxonomy (Structure of the Observed Learning Outcome) (Biggs 2003, 38–41). Here the intent is not to focus on the levels of preunderstanding but on real understanding in the academic sense. According to the SOLO taxonomy this means focusing on the levels of relational and extended abstract level. By the relational level, Biggs means that in the case of understanding, "seeing the forest is needed instead of just seeing the trees". In other words, this idea means that concepts have a systemic nature and in this phase the systemic nature needs to be turned into a visible form (i.e. a concept map). Here it is easy to recognize the parallel with the ideas of CHAT (more precisely, e.g. with the Vygotskian line of thinking).

An extended abstract level means in practice that on that level the student goes beyond what has already been given. In other words this means that he invents something relatively new (e.g., a new solution to an age-old problem). Seeing the reality from a fresh but justifiable angle seems to be an effective method for new kinds of solutions (Bruner 1996, 13, the perspectival tenet; Takeuchi & Nonaka 2004, 7). Collectively this means that in order to reach this level at all one needs to become familiar with multiple perspectives, navigate effectively socially and follow many cognitive trails.

Subjective understanding is not necessarily accompanied by *the ability to explain* (Bereiter 2002, 110) but for objective societal understanding, and justifiable explanations are necessities. Traditionally the teacher has been the one who has to explain things to the students, but if the aim is to deepen the students' understanding,

[225] E.g. in his dictionary for adult educators Peter Jarvis (1999, 190) explains that understanding means to learn, know, and have the ability to provide an explanation of a phenomenon – it is a form of deep learning.

this has to be balanced by giving the students opportunities to teach themselves reciprocally (cf. e.g. the reciprocal teaching; Palincsar & Brown 1984; Brown & Palincsar 1989; Brown & Campione 1994; also Hakkarainen et al. 2004, 317–339, 191–192, 133–134).

The dynamic nature of inquiry arises from the fact that the generation of intuitive explanations and obtainment of new scientific information makes new research questions accessible, a situation that could not have been foreseen in the beginning of the inquiry (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 199). For example in curriculum planning processes this means that instead of endless details[226], also big ideas and the core content should be described.

Searching for and working with explanatory scientific knowledge is necessary for deepening one's understanding (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 198). The inquiry process is a mix of lots of *reading*, *writing*, *drawing, discussing*, *thinking, acting* and so on. Especially reading seems to be a rather neglected action due to the "paradigmatic" barriers allowing researchers to solely focus on the chosen "paradigm" and often ahistorically turning the blind eye to the fact that also the researchers learn during their lifelong learning processes[227].

When the inquiry process is driven by fundamental questions, the course of the inquiry goes rapidly beyond chosen research programmes and for example from the military sciences to the overall field of social sciences and occasionally even to natural sciences[228]. While progressively inquiring the student learns to go beyond the predefined set of alternatives (cf. Bateson's Zen pupil; Model A learning[229]) aiming to understand the principles (or strategic rules, Hintikka 1999, 2; Model B learning) of the solutions to be made in the future. Ultimately the pendulum of responsibility will swing from the teachers to the students (Model C learning) and back to the middle (i.e. a shared responsibility) in the process of collective knowledge creation. Consequently, the

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[226] Nowadays the European adaptation to the ECTS system demands all those participating in the process to include the calculations of how credits can be got in the written curriculums. Hopefully we never forget that the ultimate end of higher schooling *is not* just getting credits (quantity) and consequently, balancing the *quality* needs to be remembered. Interestingly the emphasis on quality cannot be solely replaced by paper but its effects have to be figured out also in other aspects of our social and natural reality. For criticism for our current way of living see e.g. cf. Toulmin (1990, 186) claiming how the "modern" focus on the *written*, the universal, the general, and the timeless – which have been monopolizing the work of most philosophers (also others as well) after 1630 (after Desctartes) – is being broadened to include once again the oral, the particular, and the timely. See also Sennett (1998).

[227] Sometimes this point can be seen in the form of differentiating the early and late thinking of the chosen researcher but generally this point has been rather neglected by scholars and practitioners alike.

[228] Obviously this point has been made from the social scientific point of view.

[229] Models A, B and C are modified of the analysis made by Pauliina Rainio (2003) (Hakkarainen, Bollström-Huttunen, Pyysalo & Lonka 2005, 68-73).

research process within a single "paradigm" or even research programme is an unjustifiable alternative.

Currently we seem to be in a state of inability to distinguish between learning and knowledge building, causing a dilemma to emerge to be struggled with (Bereiter 2002, 21). One way out of this dilemma is to distinguish between the three Popperian worlds[230]. Rather than being fully separable and existing, the tripartite is seen as a useful conceptual tool (cf. Hakkarainen et al. 2004, 258) to emphasize the pivotalness of the conceptual artifacts.

According to the best of Bereiter's knowledge Popper never went so far as to characterize World 3 as a workspace, as a sphere of activity. Bereiter has stretched the concept to give it that character although already Popper himself anticipated this kind of possibility by suggesting that one day we will have to revolutionize psychology by looking at human mind as an organ for interacting with the objects of the third world; for understanding them, contributing to them, participating in them; and for bringing them to bear on the first world (Popper 1972: 1979, 156 quoted in Bereiter 2002, 71–72). Obviously he was anticipating the emergence of the explanation of how all these worlds are interacting with each other (cf. Engeström 1987, 48). But despite of this he or even Bereiter do not explain how World 3 objects (i.e. conceptual artifacts) are created or what is the relation between the conceptual artifacts we create and a putative real world. (Bereiter 2002, 483; Engeström 1987, 48)

The relationship between learning and knowledge seems to be getting some shape but more philosophical analysis needs to be done. It is highly recommendable to compare the analysis made by Polanyi and Ryle to one's own experiences when trying to get a deeper understanding of the essence of knowledge and knowing.

8.8. Knowledge and knowing

8.8.1. Rylean and Polanyian philosophies

The debate concerning the exact nature of tacit knowledge seems to be stacked on the level of appropriate understanding of Polanyi's, Ryle's and Nonaka's writings (cf. Tsoukas 2002; Li & Gao 2003; cf. chapter 4) but the way out of this impasse is not just reanalyzing these thinkers, although it cannot totally be neglected while socializing into the present social scientific field. After reanalyzing these philosophical

[230] World 1 as the physical world; World 2 as the subjective or mental world; World 3 as the world of ideas; Bereiter (2002, 64); cf. Popper (1972: 1979); Popper & Eccles (1977).

thoughts one needs to go beyond the mystified abstract conceptualizations of tacitness by following the scientific cognitive trails of various disciplines.

The main reason for going beyond the uncritical acceptance of the chosen philosophies becomes clearer when recognizing that although both Polanyi and Ryle knew some of the most fundamental questions[231], they did not know the "exact" answers to those questions. While seeking more reasonable and justifiable answers to the posed fundamental questions, the possibility of scientific progress since the times of Ryle (1900–1976) and Polanyi (1891–1976) cannot be totally neglected.

Gilbert Ryle (1949, 29) criticized the intellectualist legend, claiming that to do some thinking what one is doing is always two things; namely, doing a bit of theory and then doing a bit of practice. According to Ryle, acting intelligently does not embody two processes, one of doing (knowing *how*) and another of theorizing (knowing *that)*, but just one. Interestingly, in the process of acting intelligently both types of knowing are intertwined, as has been exemplified by the following Rylean persons.

According to Ryle a well-trained sailor boy can both tie complex knots and discern whether someone else in tying them correctly or not. But he is probably incapable of the difficult task of describing *in words* how the knots should be tied. Here Ryle's thinking goes parallel with Michael Polanyi who has also emphasized that *we can know more than we can tell* (cf. Ryle 1949, 56; Polanyi 1966, 4). It seems to be possible to think that the "well-trained" sailor boy has acquired the ability to tie knots only by imitating, being totally unaware of any theories.

Also Ryle's chess player could make permitted moves without knowing anything about the rules of the game (Ryle 1949, 40–41). But in order to develop as a chess player, a novice player cannot just imitate, but needs some form of knowing *that* taught by master players or maybe studying books by himself.

Ryle's mountaineer is continuously learning while walking over ice-covered rocks in a high wind in the dark, endlessly wondering what might happen and how to survive in such a hostile environment. Also to mountaineers just knowing how is not enough because all the time they are searching for "new tricks" (i.e. knowing that) and ways to improve their competence in practice (cf. Ryle 1949, 42). Similarly a

[231] Cf. i.e. the Cartesian split and the mind-body problem (Ryle 1949, 32-33; Polanyi 1966, 29). According to Polanyi (1966, 15) "man's highest creative powers have bodily roots" needing to be understood with the assistance of science and social sciences.

soldier does not become a shrewd general merely by endorsing the strategic principles of Clausewitz (just knowing that) but he must also be competent to apply them (knowing how) (Ryle 1949, 31).

"A man knowing little or nothing of medical science could not be a good surgeon, but excellence at surgery is not the same thing as knowledge of medical science" said Ryle (Ryle 1949, 49). Unparadoxically, someone could be bad at practicing when also good at preaching (only knowing that), or on the other hand even worse at practicing when also worse at preaching. Following Ryle we can ask whether it is possible to achieve excellence (i.e. intelligence) in the field of soldiering if the touch to theories (i.e. knowing that) has been lost[232].

Although an expert soldier will know more than he can tell by adequate means (Polanyi 1962: 1966, 5), he can identify more what he knows about excellence in soldiering. But he cannot, not even with his peers and collaborators, identify it all because of the *inaccessibility paradox,* turning assumed codification into an impossibility.

The notion of *indwelling* is a central one in Polanyi's philosophies and for those looking for adequate means to put tacit knowledge into use. According to Polanyi, indwelling means that we make external objects (probes, tools, teachers) as parts of our own existence and extensions of our own body, simultaneously amplifying our capabilities. During the indwelling process these things change their appearance, and finally by indwelling in them we will understand their joint meaning (Polanyi 1962, 59, 1966, 17–18, 30; Schön 1983, 52, 1987, 23). Polanyi's argument about the essentiality of indwelling in the knowing gets a more practical meaning when recognizing that e.g. a theory (a tool) can be learned only by practicing its application for some purpose. Thus indwelling can be seen to break the traditional dichotomies between mind and body, reason and emotion, subject and object, and knower and known. Therefore, scientific objectivity is not the sole source of knowledge, but much of our knowledge is the fruit of our own purposeful endeavours in dealing with the world[233]. By emphasis on the indwelling proposed by Polanyi it is possible to see the obvious connection between tacitness and cultural knowledge resources available to be used for extensions of the cross-appropriated knowledge base.

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[232] Nissinen (2001, 138; cf. Toiskallio 1998a, 9) explains the main idea of military pedagogy as follows: Military pedagogy is a doctrine of training skills. It is a doctrine of setting goals, guiding learning and assessing training activities and know-how. Curiously knowing how and skills are emphasized, giving no room for elaboration of the possible usefulness of the knowing that type of knowledge for the soldiers of the FDF.

[233]According to Varela, Thompson and Rosch (1991, 14) experience and scientific understanding are like two legs without which we cannot walk; cf. Knorr-Cetina (1999, 99-100) about scientists with *experienced body*.

The appropriation and cross-appropriation of Polanyi's concept of tacitness to various spheres of life gives a useful example of the issue for e.g. management (Argyris 1999; Argyris 1990; Argyris & Schön 1996; Nelson & Winter 1982), military command (Horvath, Forsythe, Bullis, Williams, McNally, Wattendorf & Sternberg 1999), teaching (Torff 1999; Minstrell 1999), science (Kuhn 1962: 1970, 191–198; Knorr-Cetina 1999; Collins 2001) and sports (Berman, Down & Hill 2002). For learning organizations, and also those aiming to be such in the future, emphasis on tacitness means focusing on what the practitioners know and what kind of problems they counter in the field activities. Instead of abstract lists of "should know", the focus needs to be on concrete practices in the field, hopefully aiming to learn and create knowledge based on their expertise. Curiously, also in the age of the Internet, face-to-face contacts are needed maybe even more than ever, due to the information overflow and constraints for societal sensemaking. This topic will be discussed later in this analysis when focusing on the claimed "social tacit" knowledge unknown to Polanyi himself.

When focusing on our bodily roots of tacitness and while trying to solve the *inaccessibility paradox* it is necessary to recognize a close parallelism between *implicitness* and *tacitness*. A distinction between declarative and procedural knowledge is frequently made in psychology (Anderson 1995, 308–309; Damasio 1994; Bransford, Brown & Cocking eds. 2000, 124–126; Sun, Merrill & Peterson 2001). Declarative knowledge is *explicit* knowledge that we can report and of which we are *consciously* aware. Procedural knowledge is knowledge of how to do things, and it is often *implicit* (Anderson 1995, 308–313). Similarly the memory can be divided to procedural and declarative memories (Bransford, Brown & Cocking eds. 2000, 124; Sun, Merrill & Peterson 2001; Dienes & Perner 1999). Therefore, the claimed difference between tacitness and implicitness vanishes[234] and the essence of these features lies in the fact that they operate largely below our consciousness.

Taking a historical perspective to the development of modern market economies, as for example Bell (1973, 20) has done, one can clearly see the change in the character of knowledge over time. To simplify, the modern society has come to mistrust intuition (also tacit knowledge and its bodily roots), preferring the explicitly articulated, most often in written form (cf. Tsoukas 2002, 2; Toulmin 1990, 186[235]). But as Bell admits, we also have to take "deeper" questions of the knowledgeable

[234] Cf. Spender (1998); Li & Gao (2003) about the "difference" between tacitness and implicitness.
[235] Toulmin claims how the "modern" focus on the *written*, the universal, the general, and the timeless – which have been monopolizing the work of most philosophers (also others as well) after 1630 (after Descartes) – is being broadened to include once again the oral (i.e. two modes of thought: the paradigmatic and narrative mode, Bruner (1986); literary mind, Turner (1996); Fauconnier & Turner (2002), the particular, and the timely. Cf. also Brown & Duguid (2000) about the current overemphasis on information or explicit knowledge.

society into account – one of these encourages us to inquire into the basis of the beliefs about man, nature and society (Bell 1973, 176 quoting Lane[236] 1966, 650). Rather surprisingly, when referring to tacit knowledge we actually refer at the same time to human bodily roots, needing to be understood also in contemporary knowledge societies.

As mentioned in chapter 4, according to Scribner (1985) the works of Vygotsky may be read as an attempt to weave phylogenetic (overgenerational), ontogenetic (life history of a individual human being) and social level into one explanatory account of the formation of specifically *human aspects of human nature.* The process of man's mental development is part of the general historic development of mankind (a phylogenetic development), explaining for example our *instinctive behaviour* (Vygotsky quoted in Scribner 1985, 123; Maturana & Varela 1980, 24; Tuomi 1999, 341).

8.8.2. Phylogenetic explanation of the main aspects of human nature[237]

The present analysis is not intended to be a "final answer" to the fundamental question of human nature already discussed above. Now the main aim is to show some direction for future progressive inquiries into the basis of tacitness of knowledge but also beliefs about the soldier (i.e. a human being) in the FDF and elsewhere. For decades we have faced the challenge of reducing man to a Behavioristic animal[238] or a closed cybernetic system. Since the Cognitive Revolution of the 1950s man and his functions have seemed to be fully explainable by computer analogies. All these attempts to overreduce (thesis) human beings and their countercriticisms (antithesis)[239] have given us more explanatory tools (synthesis) to understand the essence of ourselves and avoid the dangers of overruling technological determinism.

Also the orthodox cognitive science seems to be deeply rooted in the Cartesian tradition, meaning that while explaining intelligence and mind the body has been forgotten. The end result has been biological

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[236] According to Bell (1973, 176) Robert Lane has put forth of the idea of "knowledge society".
[237] According to Hofstedes (2005, 4) human nature is what human beings have in common despite of their cultures and personalities.
[238] In case of behaviourism a difference between Behaviourism and behaviourism needs to be made. Radical Behaviorism (with a capital B) has given way to a more moderate form of behaviorism (with a lower case b) that presents the scientific rigor of using behavior as data, but also allows hypotheses about internal "mental" states when these became necessary to explain various phenomena (Bransford, Brown & Cocking eds. 2000, 8 referring to Hull (1943); Spence (1942).
[239] For criticism against artificial intelligence or artificial life see e.g. Schank (1980); Winograd & Flores (1986); Varela, Thompson & Rosch (1991); Brooks (1991, 2001); Dreyfus (1972: 1999); Dreyfus & Dreyfus (1986); Agre (1997); Wheeler (1997); Wilson (1998).

neutrality (Wheeler 1997). Having such a view about the systemness[240] of our reality the claimed biological neutrality raises doubts.

When facing the Cartesian split between mind and body the Damasionian (1994) view offers a safe way to bridge the split. Rather than "I think, therefore I am"[241] actually "we are and then we think". According to Damasio (1994) one main reason for the continuity of the Cartesian split is that it seems to be self-evident and in no need of re-examination. Yet long before humanity, beings were beings. At some point of evolution, an elementary consciousness began. Consciousness is a necessity for the generation of sympathy, vicarious experience of emotions, and those differences that make us humans (Leakey & Lewin 1993, 302). With that elementary consciousness came a simple mind; with greater complexity of mind[242] came the possibility of thinking and of using language to communicate and organize thinking better (Damasio 1994, 248).

According to Damasio (1994) human brains are complex enough to generate not just motor responses (operations) but also mental responses (images in the mind). The mental responses enhance the survival of the organism by one or all of the following means:

- A greater appreciation of external circumstances.
- A refinement of motor responses.
- A prediction of future consequences by way of imagining scenarios and planning actions conducive to achieving the best imagined scenarios.

Based on innate goals and biological systems of "reward and punishment" we have an array of so called *"somatic markers"*. We have and experience bodily gut feelings of imagined or experienced events. These feelings are either positive or negative, depending on the match or the lack of a match between us and the circumstances. An event is "bad" or "good" because of its possible impact on survival and on *the quality of survival* (Damasio 1994, 125). This "somatic marker' forces attention on the negative outcome to which a given action may lead, and functions as an automated alarm signal (cf. System 1) allowing us to choose from among fewer alternatives. After this automated processing there is still room for willpower and using a

[240] cf. e.g. the system typology of Mingers (1997); See Ryle (1949) about the category mistake.
[241] Descartes, originally printed 1637-1641 (reprinted in 1988, 17). Descartes gives primacy to the mind separating it from the body.
[242] According to Damasio (1994) bodily feedback and persisting bodily imagery contribute crucially to the human thought. The mind is embodied (cf. Varela, Thompson & Rosch 1991) and it has arisen out of an organism rather than out of a disembodied brain. About the origins of the modern mind see Donald (1991, 2001). See Chalmers (1995, 1997) for "easy" and "hard" problems of consciousness; how to actually explain our experience and what is the relationship between matter and life, see e.g. Brooks (2001).

cost/benefit analysis and proper deductive competence (cf. System 2). (Damasio 1994, 173–175; cf. Wilson 1998, 112–115)

It can be even said that the social life has made us intelligent (Leakey & Lewin 1993, 285). The traditional explanation has been that the technology is the driving force behind human brain expansion. The man is seen as a "toolmaker" (Oakley 1949 in Leakey & Lewin 1993, 249). Oakley was partly right if we recognize that not just physical tools (cf. technology) made us humans but also *psychological tools* (language) and the need for sophisticated communication.

Our evolutionary history has endowed our species with an inclination to cooperate (Leakey & Lewin 1993). We can even say "sharing, not hunting or gathering as such, is what made us human" (Leakey & Lewin 1983 in Engeström 1987, 77). Sharing means also the need for division of labor. While hunting the human bands recognized that effective division of labor is needed if the hunting is supposed to be successful. But on the other hand, although the needed labor is divided, to the individual human beings the effects of these individual efforts have to be *recombined* on the social level as Leont'ev explained in his famous example (Leont'ev 1981, 210; cf. chapter 4).

So it is important to recognize that not the hunting or gathering *per se* was the main point in our evolutionary history and that not only sharing, but *coordinating* and *recombining* our individual *efforts* and *actions* is the key to understand the difference between for example apes and humans. In other words societal coordination and recombination mean *alignment.* The recombination and "social chess"[243] was both an effective way to fulfill individual human needs (hunger, safety, socialness etc.) but it also acted as an accelerator for the development of our brains. We can see that the *urge to know* is a defining feature of humanity – and that the thing most urgently needed to know and understand was and is the most intellectually challenging – the other individuals (Leakey & Lewin 1993, 286; cf. also Maturana & Varela 1992, 174).

The two-million-year heritage of a hunting-gathering-sharing life has left its mark on our minds just as much as on our bodies. On top of the technical skills of planning, coordination, and technology there was, equally important, the social skill of cooperation. A sense of common goals and values, a desire to further the common good,

[243] In the words of Hintikka (1999) we can figure out that maybe not just descriptive rules (how to make moves in chess) but strategic rules of the game are needed if the aim is win for example Kasparov in chess. The chess game theme is also familiar to those having heard the latest news about the unbeatable computers winning humans in chess. Actually we as humans are not just playing chess, and hence the complexity of the game (i.e. the life) cannot be fully reduced to the chessboard but it has to be met and hopefully successfully on a daily basis. In this kind of game it is not at all so sure who will win (machines or humans) or whether we are actually playing a win-win game.

cooperation was more than simply individuals working together. It became a set of rules of conduct, of morals, an understanding of right and wrong in a complex social system. Through evolution humans have become *the ethical animal*. (Leakey & Lewin 1993, 304–305)

As social creatures, another main point to be recognized is the extended childhood of humans. The extended childhood and our social nature have helped us to establish "teacher-student" roles that remain stable for a decade or more, allowing a great deal of learning, practice, and modification of survival skills to occur. Humans become human through intense social learning (Tomasello 1999) and not just of survival in the practical world (Leakey & Lewin 1993, 145).

Tomasello explains that the basic fact seems to be that human beings are able to pool their cognitive resources in ways that other animal species are not. The process of cumulative cultural evolution requires not only *creative invention* but also faithful *social transmission* that can work as a ratchet to prevent a slippage backward (Tomasello 1999, 5).

8.8.3. Ontogenetically into human nature

Ontogenetically we grow in the midst of a natural and historically constituted social reality (cf. chapter 2) and traditions enabling us to benefit from the accumulated knowledge and skills of our social groups (e.g. Tomasello 1999, 10). In other words we can stand "on the shoulders of giants", using their cognitive resources to deepen our understanding or not – this is a matter of subjective and societal choice.

During the past decades the rationality of human beings has been severely challenged. Consequently the pendulum has often shifted from rationality to irrationality, loosing the difference between human beings and other creatures. Instead of this alternative, arationality[244] has been chosen in the present study.

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[244] According to Lave (1988) a common positivist epistemology assumes that rationality exists as the ideal canon of thought. By his concept of bounded rationality Herbert Simon (1957) challenged the "full" rationality implied by the rational choice model, claiming it to be an unrealistic standard for human judgement (Gilovich & Griffin 2002, 2). Simon's notion forms the background for example to heuristics and bias literature (Stanovich 1999, 241), being on the other hand criticized both inside (e.g. Dreyfus & Dreyfus, 1986; Clark 2001) and outside of the artificial intelligence (AI) researchers (e.g. Nonaka & Takeuchi 1995, 38-39; Hutchins 1995). When choosing instead of the notion of bounded rationality (cf. Hakkarainen, Palonen, Paavola & Lehtinen 2004, 24; Bereiter 2002, 355) the notion of arationality (cf. Dreyfus & Dreufus 1986, 36), the intent is to be aware of the criticism against AI and different forms of reductionism – people are doing the most influential choices, not birds or pine trees or other qualitatively "less" developed co-creatures in the games of live (cf. Dennett 1995, 456). Arationality refers to all unconscious resources of human beings (i.e. intuition, know-how, pattern matching) used in intelligent behaviour.

Arationality refers to all unconscious resources of human beings as for example intuition, instinct and pattern matching. To be able to justify these proposals it is necessary to take a look at traditional dual-process models of our consciousness (cf. also footnote 206). In these models System 1 (below the consciousness) proposes intuitive answers to judgment problems as they arise, and System 2 (consciousness) monitors the quality of these proposals, which it may endorse, correct, or override. The judgments that are eventually expressed are called intuitive if they retain the hypothesized initial proposal without much modification. Usually it is assumed that both these systems can be active concurrently, that automatic and controlled cognitive operations compete for the control of overt responses, and that deliberate judgments are likely to remain anchored on initial impressions.

But what features of System 1 create the error and why are errors not always detected and corrected by System 2? In the late 1960s and 1970s, a series of papers by Amos Tversky and Daniel Kahneman[245] revolutionized academic research on human judgment. The central idea of the "heuristics and biases" program is that judgment under uncertainty often rests on a limited number of simplifying heuristics rather than extensive algorithmic processing. (Gilovich & Griffin 2002, 1)

At the outset, some basic facts of heuristics are worth noticing. Firstly, although heuristics are distinguished from normative reasoning processes by a pattern of biased judgments, heuristics themselves are sensible estimation procedures that are by no measure irrational but *arational* (Dreyfus & Dreyfus 1986, 36). Secondly, although heuristics yield "quick and dirty" solutions, they draw on underlying processes that are highly sophisticated. Finally, the heuristic processes are not exceptional responses to problems of excessive complexity or an overload of information, but normal intuitive responses to even the simplest questions about likelihood, frequency, and prediction (Gilovich & Griffin 2002, 3).

Originally Tversky and Kahneman proposed four general-purpose heuristics in 1974 – availability, representativeness, anchoring and adjustment. Based on the analysis of Kahneman and Frederick (2002, 56) it is justifiable to replace the anchoring heuristic by affect heuristic. The availability heuristic means that although System 2 monitors the output of System 1, people are not accustomed to thinking hard, and are often content to trust a plausible judgment that quickly comes to

[245] Daniel Kahneman received the Nobel Price in Economics (The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel) in 2002 for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty, see nobelprize.org.

mind. Interestingly System 1 heuristics, and biases that arise from them, are difficult to avoid even in the context of deliberate choice (Gilovich & Griffin 2002, 17). These biases are especially difficult to avoid if *societal control mechanisms*[246] are scarce, malfunctioning or relatively non-existent especially in the climate of organizational silence.

The representativeness heuristic means an assessment of the degree of correspondence between a sample and a population, an instance and a category, an act and an actor or, more generally, between an outcome and a model (Tversky & Kahneman 2002, 22). The affect heuristic means that images are and will be "marked" by positive or negative feelings and these "marked images" influence our judgments and decisions (Slovic, Finucane, Peters & MacGregor 2002; cf. Damasio's "somatic markers"). But what kinds of images and experiences are gained (i.e. perceived) and marked positive or negative on the basis of what kinds of reasons during schooling[247]?

Following the Gibsonian extension of Polanyi's idea "we can see more than we can say" (Gibson 1979, 261), how we see and perceive affects what we know[248]. In the field of visual perception there are two competing approaches to perception (Norman 2002): the traditional Helmholtzian constructivist-inferential approach (cf. e.g. Marr 1982) and the Gibsonian ecological-direct approach (Gibson 1979; Neisser 1994). The Gibsonian direct pick up of information (perception) operates more or less *below the consciousness* (cf. Gibson 1979, 250), being a feature of System 1. Perceiving is keeping touch with the world, experiencing things rather than having experiences – *resonating* with it (ibid, 239, 246) and consequently affecting the proposals made by System 1.

The constructivists see perception as a conscious and multistage process between stimulation and percept – perception is indirect. For them memory, stored schemata and past experience play an important role in perception, causing perception-perception causal chains to emerge[249]. For the ecological theorists perception is a single stage

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[246] By societal control mechanism I refer to the societal processes where subjective biases are corrected; Tetlock (2002); Weick (1995, 2001); cf. dangers of groupthink, Janis (1983); Amidon (2005).

[247] In a sense an affect pool is a collection of previous *experiences* labeled as "good" or "bad" etc. According to Damasio an event is "bad" or "good" because of its possible impact on survival and to *the quality of survival* (Damasio 1994, 125) suggesting a global sphere of interests. Metaphorically speaking the affect pool is a subdivision of memory containing memorized knowledge. Again the process of accumulation deserves attention.

[248]According to Ulrich Neisser (1976, 9) perceiving is the basic cognitive activity out of which all others must emerge.

[249] To recognize something is to note a congruence between the information available now and information preserved from some earlier occasion (Neisser 1994, 235). According to Gibson (1979, 246) we can perceive the world only if we already know what there is to be perceived.

process that is direct and immediate. For them there is no role for memory in perception (Gibson 1979, 254; Norman 2002, 74–75). According to Gibson the presence of stimulus information cannot be said to cause perception. Perception is not a response to a stimulus but an act of information picked up from the world, offering *affordances*[250] either for good or ill (Gibson 1979, 56–57, 127, 130).

In spite of the sharp contrast between the constructivist and ecological approaches there have been attempts to reconcile the two approaches (Norman 1983, 2002; Neisser 1994). According to Norman (1983, 31),

> To sum up, it is being suggested that both direct and indirect perception occur, that they do not define a dichotomy but a continuum, and that the location of a perceptual act on that continuum is determined by some interaction of the difficulty of the perceptual discrimination required and the richness of the stimulus conditions…. The challenge facing the perceptual theorist is not to choose between the theories, but to incorporate the two approaches into a common framework with the aim of delineating the conditions under which direct and indirect processes emerge.

Towards the end of his *Ecological Approach* Gibson (1979) proposes "a redefinition of perception",

> Perveiving is an achievement of the individual, not an appearance in the theatre of his consciousness. It is a keeping-in-touch *with the world* (italics added), an experiencing of things rather than a having of experiences. It involves awareness-of instead of just awareness. It may be awareness of something in the environment or something in the observer or both at once, but there is no content of awareness independent of that which is aware. (Gibson 1979, 239; quoted in Norman 2002, 85)

This view contrasts with the constructivist perspective of a perceiver who *passively* examines his conscious awareness of the stimulation impinging on his senses. Instead of this the perceiver uses his resources systematically[251] and *actively* to perceive affordances of his environment. In the case of humans we can argue that to some extent

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[250] According to Gibson (1979, 135) behavior affords behaviour (i.e. mutual affordances) and all kinds of behavior depend on the perceiving of what other persons afford, or sometimes on the misperceiving of it. Cf. Neisser (1994, 233).

[251] According to Gibson (1979, 240) perception is neither a mental nor a bodily act. It is a psychosomatic act, not of the mind or of the body but of a living observer.

we actually *seek affordances* or *dynamic affordances*[252] to be appropriated and cross-appropriated.

Both the practitioners and critics of artificial intelligence think that the human intelligence is strongly based on our abilities to do pattern matching[253], modelling, anticipating, and manipulating of our environment[254] (Rumelhart, Smolensky, McClelland & Hinton 1986, 44).

But to what extent are these human intellectual accomplishments shared by for example soldiers naturally needs to be studied. Interestingly, just the lack of these accomplishments has been identified to be one reason for military incompetence (Dixon 1976) or military misfortunes (Cohen & Gooch 1990). Cohen and Gooch stress the centralness of three types of failures for military failures: failure to *learn*, to *anticipate*[255] and to *adapt*. But instead of just blaming individuals for incompetence (Dixon 1976), we must examine *the structures* through which these claimed incompetencies emerge[256]. When speaking about structures, our basic assumptions about man come to the fore: to what extent do we *expect* and assume that agents (human beings) can influence and develop the societal structures[257]? After choosing our position in the issue are we ready to recognize the consequences of our expectations (James 1890: 1950; Weick 1995, 146)?

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[252] According to the Gibsonial approach to perception every purposive action begins with perceiving an (static) affordance (Neisser 1994, 231). According to Cook and Brown (1999, 390) in a sense forms of affordances (i.e. dynamic affordances) emerge as part of the our interactions with those objects. This kind of interpretation allows us to act actively seeking dynamic affordances (i.e. knowledge) from our global environment.

[253] Cf. the "holistic similarity recognition" emphasized by Dreyfus & Dreyfus (1986, 28); Clark (2001, 37-38).

[254] According to Rumelhart, Smolensky, McClelland & Hinton (1986, 45-46; quoted also in Wertsch 1998, 29) "especially important here is our ability to manipulate the environment so that it comes to represent something. This is what sets human intellectual accomplishment apart from other animals. Few of us are very good at multiplying 343 times 822 directly but when this abstract problem is reduced, e.g. by pencil and paper, to a series of concrete operations many of us can do the needed calculation". For our educational arrangements, including also assessment practices, this fact needs to be obviously reminded.

[255] In the case of the FDF the dangers of this tendency seem to be avoided by the shared practices to make a new vision (including "a knowledge vision"; emphasis on human security matters) and collectively trying to anticipate and also *make* its future. Cf. chapter 7 and the thematic interviews.

[256] Field Marshall Joseph Joffre has been reported to have been "fond" of saying that "he did not know whether he was responsible for the victory on the Marne in September 1914, but he knew one thing – if the battle had been lost, it would have been he who lost it" (Cohen & Gooch 1990, 3; Johnson, Wrangham & Rosen 2002, 258). But can it be so that the members of an institution and an organization actually do share the responsibility both in times of victory and defeat?

[257] Compare for example the Durkheimian and Giddensian tradition.

8.8.4. Human nature in the societal dimension

Instead of taking the Popperian philosophical stance, the extended Leont'evian scheme presented in subchapter 8.4. deserves another look. From this angle not artificial worlds but the epistemological infrastructure of the knowledge intensive organization have to be stressed. **Figure 8.5** depicts the general idea of the organizational epistemological infrastructure.

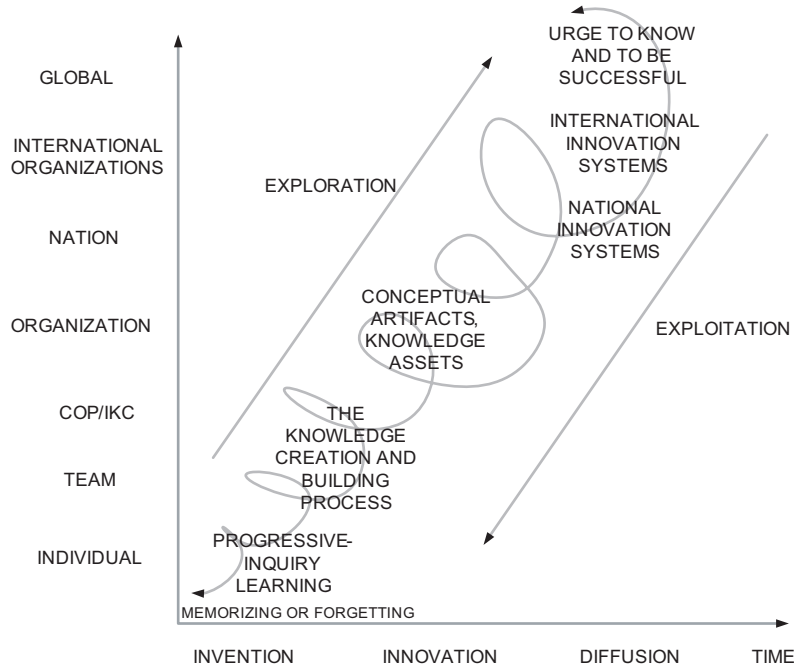

Figure 8.5 The organizational epistemic infrastructure

The central premises of the idea of the epistemological infrastructure of the organization are multilevelness (i.e. invididual, group or community, and organization etc.), linkedness (i.e. the levels are linked by social and psychological processes), and cognitive agents' affect actions (and vice versa) (cf. Crossan, Lane & White 1999, 523; Tuomi 1999, 341; Giddens 1984; cf. Hakkarainen 2003).

Here the focus is on the proposals made by Crossan with his colleagues and also by Tuomi. According to Crossan, Lane, and White (1999, 524–525) intuiting and interpreting occur on the individual and group level, while integrating and institutionalizing occur at the organizational level. On the other hand, Tuomi (1999, 341–364) explains how accumulation, anticipation, articulation, appropriation, and action

happen at the individual and communal level and how growth, innovation, and renewal occur at the organizational level. Also Tuomi identifies the essential role organizational routines or institutionalizing processes play at the organizational level.

Having identified the basic structure of the epistemological infrastructure, let us return to knowledge. As it is both a product and a process (i.e. a process of knowing; cf. chapter 4) we have to face the challenge of explaining the procedural nature of knowledge: how can knowledge be residing at the same time in the persons and also within persons and how are the psychological and social processes mentioned above intertwined in the epistemological infrastructure?

Each of these psychological and social processes needs to be understood in its own right, but before this a synthesis can be made. Obviously memory plays a crucial role in learning; it is not even possible without some sort of *memory*[258] and other *past oriented* actions and activities (e.g. the accumulation, interpreting or sensemaking (Weick 1995, 2001) processes). Anticipating or intuiting, and appropriation (see chapter 4), or even cross-appropriation[259] (Spinosa et al. 1997) are *future oriented, either explorative or exploitative* (March 1991: 1996; Sutter 2002; Engeström 2004b) actions or even activities. At the organizational level, systematizing, integrating, routinizing or institutionalizing, but also occasional destabilizing processes play an essential role. On all levels of analysis, *communication*[260] can complement social activities.

Not just new kind of epistemic infrastructure in the form of synthesis needs to be done, but a more fundamental and transformational *shift of thinking is needed*. Our habituated ways to see our current social reality is challenged in **figure 8.6**.

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[258] Consequently, the phenomenon of memory comes to the fore as a useful phenomenon for the progressive inquiry (see e.g. Anderson 1995; Becker & Morris 1999; Forde & Humphreys 2000; Cowan 2001; Schacter 2002; Bransford, Brown & Cocking eds. 2000; Hakkarainen et al. 2004). The memory seems to be reconstructive, partly limited (e.g. the magical number 7+-2 in human processing; Miller 1956; cf. Cowan 2001) but interestingly these limitations could be overcome to some extent by for example clustering (i.e. organizing disparate pieces of information into meaningful units; seeing the forest instead of just the trees).

[259] Cf. also the Giddensian reflexive appropriation (1990b, 304).

[260] Cf. chapter 4 where the Shannonian unidirectional communication model was challenged by Aula (1999; double function of communication), partly based on the ideas of Nonaka.

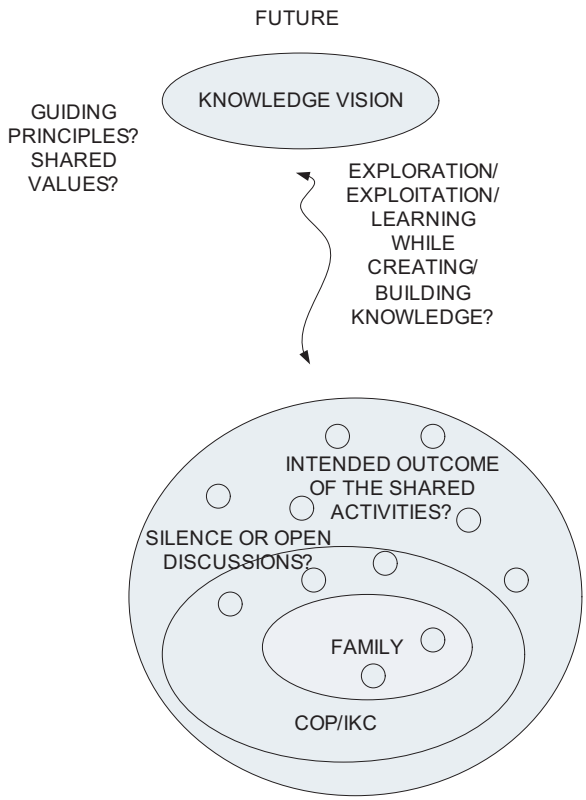

Figure 8.6 An alternative angle to organizational epistemic infrastructure

On the practical level, the embeddedness or holarchic nature of life needs to be understood (Sahtouris 2000, 52; cf. Allee 2003). Fundamentally life is a dialogue among relatively autonomous embedded holons (or in our case, agents; actors; human beings), *all of which are critical to the function of the holarchy (*i.e. the complex social system). It was described earlier in this study how the development of systemic thinking has been evolving, currently emphasizing *complex systems.* The essential idea of complex systems is that rule-governed (i.e. shared guiding principles) interaction among a set of interconnected individuals *can* generate emergent structures (Monge & Contractor 2003, 85; Jackson 2000, 88; Kupers 2001; Tsoukas & Chia 2002; Anderson 1999; Cohen 1999; Wheatley 1999[261]) intentionally and purposefully. Having said this, it is relatively easy to figure out how *fatal* features organizational silence, over-individualism, and misalignment can be for organizations and especially for the FNDC.

[261] When we inquire into the depths of complexity theories we should not lose sight of the basic differences (i.e. the difference between man and animal or material thing typologized by e.g. Mingers 1997) between different kinds of systems.

Dialectically speaking, in case of learning organizations, there are also not-yet-learning organizations as well as there can be said to be intelligent organizations and not-yet-intelligent organizations, and also remembering and forgetting organizations. Surprisingly, *organizational stupidity* (i.e. not-yet-intelligent) has received less attention among researchers despite of the fact that it seems to be a much more widely distributed phenomenon than organizational intelligence (Hakkarainen, Palonen, Paavola & Lehtinen 2004, 96). Therefore, it comes as no surprise that also organizational silence has been a rarely explored issue[262] (Morrison & Milliken 2000).

Before entering the studies on organizational silence, a brief introduction to the reasons of communication failures is needed. It can be assumed that these failures have been partly caused by accepting uncritically the main premises of the classical model of a communication event (A-> B = X) (Shannon & Weaver 1949: 1998; Lasswell 1948 and Bavelas 1948, 1950 according to Taylor 1993, 256-257). As already mentioned, the Shannonian classical model has been challenged for example by Pekka Aula (1999) in his double function of communication[263].

In the classical communication model failures are attributed to either encoding or decoding breakdowns, perhaps because the sender did not express himself or herself correctly, or because the receiver was inattentive or ill-disposed, or because of extraneous interference, known as "noise" (Taylor 1993, 251). In this scheme the impossibility of full encoding (tacit knowledge not fully in a explicit form) and context specific features are neglected.

Referring to sociological theories of Luhmann (1995), Tuomi (1999) argues that communication is based on active management of the differences of understanding[264], information, and utterance, the main improbabilities of communication being accessibility (does it reach its addressee), acceptability, and understandability. In what follows the acceptability of communication plays a role.

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[262] Cf. chapter 4 and some unanswered questions of Nonakian theories such as: What are the main obstacles to communication and how can these be avoided? There seems to be no reason to take "emergence" of communication for granted.

[263] Undoubtedly the Shannonian model has been widely criticized but here it is not elaborated further. It suffices to say that already Polanyi (1966, 36-37, 206) was clearly aware of the weaknesses of the Shannonian model. According to Polanyi (1966, 207) the words spoken should be thought of from the point of view of the person spoken to. The tacit personal coefficients of speech are transmitted by inarticulate communication and the power of speech to convey communication depends on the effectiveness of this mimetic transmission (Polanyi 1966, 17). For additional criticism against unidirectional causal models of communication see e.g. Contractor (1994, 46); Taylor (1993, 62-63).

[264] Tuomi's understanding of understanding differs from the one elaborated on and accepted in this study.

According to Tuomi, within Luhmann's theory of communication there is no easy way to describe what motivates acceptance or rejection. In practical speech situations acceptability may depend on issues like *power* and *trust*, and these can also be managed (Tuomi 1999, 190; italics added). According to Luhmann (1995, 129) trust is the universal circumstance of action. Interestingly Luhmann's "subjectless" (Tuomi 1999, 256) sociological theory sees how society remains dependent on sensors (human beings in the full sense of their interpretation) that convey the environment (Luhmann 1995, 410; cf. 210–212), and the "sensors" expect trust as a context specific feature to be uttered in the first place (Rousseau, Sitkin, Burt & Camerer 1998; Zaheer, McEvily & Perrone 1998; Dirks & Ferrin 2001; Wicks, Berman & Jones 1999; Williams 2001; Adler 2001; Heckscher 2001).

Let us now return to the situation where communication emerges – or where occasionally open communication turns to organizational silence. Before entering the issue of silence it needs to be highlighted that the main question is the optimal level of silence (Saville-Troike 1985; Pinder & Harlos 2001, 362[265]) and the optimal "distance" between discourse and practical activity. According to Engeström (1999d, 171), most organizational activities fall in the middle where practical activity is accompanied and complemented but not replaced or accomplished solely by talk[266].

According to Morrison and Milliken (2000, 708–710), organizational silence is an outcome that owes its origins to *managers' fear of feedback* and *a set of implicit beliefs* often held by managers (i.e. employees and subordinates are self-interested and untrustworthy[267], the management knows best, and unity is good[268] and dissent is bad). It is really noteworthy that when there is heavy strategic emphasis on control, the managers may view negative feedback as more threatening and dissent as more destructive (ibid, 711).

Presently at the FDF, under the umbrella of developing leadership according to the principles of Deep Leadership (Nissinen 2001; cf. also

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[265] According to Saville-Troike (1985, 4) communicative behavior consists of both sounds and silences, and the adequate description and interpretation of the process of communication requires that we understand the structure, meaning, and functions of silence as well as sound.
[266] The distance varies along the dimension of "divorce" and "merging" of discourse and practice. Remember the preachers, auctioneers and talk show hosts as examples of those whose practical activity and discourse seem to merge almost completely to talk as practice. Remember cases when the discourse is not complemented and accompanied by talk. It needs to be remembered that too little silence, or alternatively too little open discussions, can be dysfunctional (Pinder & Harlos 2001, 362).
[267] Possibilities to open discussions about cultural basic assumptions (i.e. man) are restricted because of organizational silence and other cultural constraints. Argyris and Schön (1978) refer to this very same issue when they talk about often undiscussable governing variables.
[268] Cf. mentioned dangers of groupthinking; Janis (1983); Amidon (2005).

the transformational leadership by Burns 1978, 2003; Bass 1998), the widely shared fears of feedback[269] are met. At the same time also the parallel needs for self- and collective reflections on the other *basic cultural assumptions* are increasing. This kind of development seems to be highly recommendable also from the perspective of organizational communication and silence studies.

The traditional tendency in all kinds of organizations, undoubtedly including military organizations, has been to assume that the management knows best about most issues of organizational importance. This kind of assumption can be labeled as a centralized knowledge view. In chapter 4 this centralized view was challenged by the *decentralized knowledge view*[270]. Knowledge as a valuable resource seems to reside inside human beings, within their activities, and also as a cultural resource (i.e. knowledge assets; conceptual artifacts). For managers this means in practice that instead of a single individual, the community or the organization knows best.

It was also mentioned in chapter 4 that knowledge is a reality viewed from a certain angle (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004). Consequently, in knowledge creation (or in knowledge management if preferred) one tries to see the entire social reality by interacting with those who see it from other angles. For managers this means that the angles of expert subordinates are currently a highly valued success factor for our organizations (Boland & Tenkasi 1995) and an unavoidable fact for the educational institutions (Bruner 1996).

The above mentioned origins of organizational silence are often fostered by specific organizational conditions. For example, the assumption about the employees' self-interest is likely to be common because it appears to be rooted in the system of management education currently entrenched in the United States (Morrison & Milliken 2000, 710) and elsewhere (Ghoshal 2005). But what kinds of assumptions about the human nature are shared in the FDF and do we have some *shared interests*?

During the empirical part of the present research "an impossibility" emerged (cf. chapter 6). On the other hand the teachers felt strongly the superficiality of the continuous educational development processes. They also seemed to believe that speaking up about problems in the FNDC is not worth the effort, it is a sheer impossibility for the teachers

[269] To be precise more feared than just feedback is other than confirmatory feedback (Swan & Read 1981).

[270]Also researchers of organizational silence and voicing restrict their studies into situations where and when the personnel have relevant ideas, information, and opinions about improvements with relevance to their work and organization (Van Dyne, Ang & Botero 2003, 61).

to make a contribution to the whole activity system of the FNDC (rules, community, and division of labour should be excluded from the activity system model in the case of the FNDC), and finally voicing one's opinions and concerns *publicly is dangerous*. Interestingly also researchers of organizational silence (Morrison & Milliken 2000, 714; Bowen & Blackmon 2003, 93; Pinder & Harlos 2001, 337) have identified the very same phenomena influencing organizational silence.

On the other hand the managers strongly felt and believed[271] in the centrality of the teachers in the educational development processes, but actually would they favor passive transmitters of old knowledge or actively inquiring teacher-as-researchers? Indeed, research indicates that individual expectations have consequences, because expectations[272] filter inputs (Weick 1995, 146). One way to solve this kind of paradox is to make firstly the managers' and then the subordinates' beliefs and assumptions as explicit and clear as possible, giving room for collaborative readjustments of the beliefs. The hypothesized saying of Pinder and Harlos (2001, 349) needs to be focused on in the future: "*once a few soldiers had spoken up, many others followed quickly".*

While assuming such discussions to begin, it seems to be reasonable to express clearly and explicitly that the general tendency of the personnel serving in the FDF of favoring some sort of behaviorism can be understood as a neglectance of the inner mental functioning of the personnel. Additionally the emphasis on constructivism and radical constructivism ("extreme individualism"; Hofstede & Hofstede 2005, 75–79 about the relative Finnish individualism) may, implicitly if not explicitly, reinforce the dominant basic assumptions hindering collectivism to flourish. Extreme individualism needs to be balanced simply because *the successfulness of individuals depends on the vitality of the whole network distributed ultimately on a global scale*[273].

Another organizational condition favoring organizational silence is the homogeneity of the top managers with functional training and experience (Morrison & Milliken 2000, 711). The homogeneity tends to sustain the cohesiveness of the managers, who are more threatened by the idea of dissent, and consequently intensify the effects of negative groupthink (Janis 1973; Amidon 2005). The professors of the FNDC seem to represent *potential* heterogeneity among the managers of the college.

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[271] Or at least they espoused these kinds of beliefs when asked in an open manner.
[272] Schemata, schema, mental models, scripts or beliefs are examples of concepts referring to rather similar phenomena. Quoting William James Weick (1995, 146) explains the issue as follows: "Confident expectation of certain intensity or quality of impression will often make us sensibly see or hear it in an object which really falls short of it".
[273] Allee (2003, 236–237), referring to the evolutionary biologist Elisabeth Sahtouris.

According to Morrison and Milliken (2000, 711) the combination of high power distance and collectivism among the top managers is particularly likely to be associated with silence-fostering beliefs. According to Hofstedes (2005, 43–44, 78–83), in Finland, as well in other Nordic countries, the power distance and collectivism are on a low level. As a conclusion, the Finnish cultural power distance and collectivism do not seem to considerably reinforce organizational silence at the FDF. But to what extent the relatively high power distance in the Armed Forces and at the FNDC reinforces organizational silence *in fundamental issues*[274] needs to be considered.

Morrison and Milliken (2000, 712) predict that the belief structure contributing to organizational silence will be more likely to dominate management thought in more mature and stable industries than in newer and/or volatile industries. This kind of prediction reveals the general myth at large: companies and organizations that are big or old *cannot* innovate in ways that transform industries. Whether this is a fact needs to be reconsidered (cf. Hamel 2000, 211[275]). Of course also big organizations can transform themselves and act innovatively, but it often takes more time and collective efforts to act in an aligned manner. Instead of the "impossibility or possibility" of deep transformations, the main question to talk about is the exogenousness or endogenousness of the transformation process. For the FDF this means being ready to use all available resources to guarantee successfulness also in the future when the *pressures to collaborate and compete will increase while its position on the Finnish-European cultural map seems to be shifting.* To this scheme the espoused intent to become a "learning organization" fits relatively well, but only if it is identifiable in the social reality of the FDF (i.e. not just on the level of instruments or in a written form only) in the future.

Since the times of Dewey, to *see* that a situation requires inquiry has been the initial step in progressive inquiry. In the words of Engeström (1987, 1999a), the very first action in such an indeterminate situation is that of questioning, criticizing, or rejecting some aspects of the accepted practice and existing wisdom. For Lave and Wenger (1991; Wenger, 1998) learning is inherent in human nature, being an

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[274] Finns are often labelled "as people who are silent in two languages" (Finnish and Swedish being the official languages of Finland) (Sajavaara & Lehtonen 1997, 264) but despite of these kinds of cultural beliefs the general climate at the FNDC seems to favour for example informal discussions on *secondary issues* and *small talk* but not *fundamentals.* Often the fundamentals are labelled as "static" (i.e. static warrior premises) or paradoxically "uncontrollable" (floating on the Finnish cultural tides) being useless topics to talk about.

[275] From the Finnish point of view Nokia's case offers a powerful counterexample from the "civilian world". Even as big and "bureaucratic" organizations as the US Armed Forces are at least espousing innovativeness (cf. Joint Vision 2020). For another example of a big "innovative" military organization see the case of Imperial Russia (Schimmelpennick van der Oye & Menning eds. 2004).

ongoing and integral part of our lives. About the social and organizational learning, Argyris and Schön (1978) might like to ask: are we then ready to seek for problems and correct them? Are we ready to reflect on our often undiscussable governing variables and principles and even deliberately and collectively develop these? Undoubtedly, occasionally we do not see the need for progressive inquiry; do not even feel the need to start questioning or criticizing, let alone rejecting some aspects of the unintelligent routines[276], the "core competencies"[277], the "absorptive capacity"[278] and existing "wisdom"[279] just espousing organizational learning and lacking transformational "deep" or double loop learning.

According to Giddens (1984, 64) ordinary day-to-day social life, to a greater or a lesser degree, involves an ontological security[280] founded on autonomy of bodily control within predictable routines and encounters. But the routinized character of the daily life does not just "happen". It is "made to happen" by the modes of reflexive monitoring of action which individuals sustain in circumstances of co-presence (Giddens 1984, 64). In some sense this mode of reflexive monitoring is a *potentiality* due to the fact that in reproducing structural properties agents also reproduce the conditions (i.e. routines; e.g. organizational silence or voicing etc) that make such action possible *or not*[281].

But here lies the true possibility for organizations aiming to be "learning organizations" – let us face our current social reality and

[276] More or less metaphorically speaking but not so literally as has often been done (Dosi, Nelson & Winter 2000, 5), knowledge resides also in organizational routines (cf. also Orr 1990; Cook & Brown 1999; Nelson & Winter 1982; Hutchins 1995; Cohen & Bacdayan 1994; Feldman 2000; Pavitt 2002; Argyris 1990, 1992: 1999; Argyris & Schön 1996; Berman, Down & Hill, 2002; routine knowledge assets of Nonaka (cf. chapter 4)). On the other hand see Giddens (1984) for the strong emphasis of routines in social life and Adler and Byros (1996) about the enabling and coercive types of formalization (routinization) in bureaucracies.

[277] According to Hamel and Prahalad the core competencies are the collective learning in the organization (1990, 82) or the bundle of skills (i.e. of coordination and integration) and technologies (1994, 223). In the case of the FNDC it can be assumed that the leadership and the pedagogical competencies (i.e. training; education) are the needed core competencies.

[278] According to Cohen and Levinthal (1990) an organization's collective abilities (prior related knowledge including basic skills and shared language) constitute its absorptive capacity. Zahra and George (2002, 186) have reconceptualized the absorptive capacity proposed by Cohen and Levinthal. According to them the absorptive capacity is a set of organizational *routines* and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability. These kinds of conceptualizations seem to be rather ambiguous and experience distant, being not necessarily so useful when making double-hermeneutically interventions to real organizations such as educational institutions.

[279] According to Polanyi, in this learning process the alert mind of the student generates, or should be allowed to generate, heuristic tension between *believed accessible range of potentialities* and *strive to comprehend,* where *imaginative thrust* plays an important role (Polanyi 1966, 89).

[280] Confidence or trust that the natural and social worlds are as they appear to be, including the basic existential parameters of self and social identity (Giddens 1984, 375). Cf. also Pollack (2003) how we are actually enveloped with uncertainty in all spheres of our lives.

[281] Structure is dialectically always both enabling and constraining (Giddens 1984, 25), and in some cases more constraining than in others, depending e.g. on the choices made by agents.

shift our thinking (cf. **figure 8.7**) and start questioning, criticizing and being personally responsible for such an organizational climate and for our emerging future[282]. *Let us be aware that the future will be shaped by ourselves despite of the fact that we can be unaware or alternatively aware of it*.

When taking a look at social knowledge and learning we have to ask what the role played by organizational memorizing and forgetting is. If we accept the view that memory plays a crucial role in individual learning, how about then in the case of organizational learning? To what extent can we use these kinds of metaphors as memorizing organizations and what is the more literal meaning of these kinds of features?

Walsh and Ungson (1991: 1997, 181-187) have built up their organizational memory from five storage bins or retention facilities: individuals, culture, transformations, structures, ecology, and external archives. Walsh and Ungson seem not to be aware of the Scheinian layered culture model presented in chapter 4 (cf. **figure 4.1**), because for them organizational culture is defined as a learned way of perceiving, thinking, and feeling about problems that is transmitted to members in the organization (ibid, 183). According to Schein (1992, 17-27) the surface level of the culture is embedded in the physical environment, its technology and products and to other material objects which can be seen, heard and felt when encountered. A little bit simplifying, Schein's surface level of the culture is the same phenomenon as the ecology or transformations[283] proposed by Walsh and Ungson.

Walsh and Ungson's (1991: 1997, 185–186) analysis is deeply rooted in the *positional* sociological tradition[284] by seeing that organizational structure is viewed as a pattern of relations among positions (i.e. roles). On the other hand their analysis also seems to be rooted in the relational (i.e. transformations) and the cultural tradition (i.e. culture), showing the obvious need to reconsider the Walsh-Ungsonian premises.

Moorman and Miner (1998) have continued the analysis of Walsh and Ungson, identifying two different types of organizational memory – procedural and declarative.[285] To them procedural memory often

[282] In the field of organizational silence, see e.g. Bowen & Blackmon (2003, 94); Dutton & Ashford (1993); Dutton, Ashford, O-Neill & Lawrence (2001) for supportive research results.
[283] Especially in the case of standard operating procedures, 185. Additionally we can ask how transformations can be other routines of the organizations. Consequently the criticism against mystified organizational routines can be turned also against the transformations favoured by Walsh and Ungson.
[284] Cf. Monge, Contractor (2003, 19-20); in other words the functionalist view (for criticism against this kind of position see e.g. Giddens 1984; Luhmann 1995).
[285] Cf. the short analysis of the memory of individuals done in this chapter, identifying the same types of memories.

represents tacit knowledge for individuals and organizations (Moorman & Miner 1998, 708). Obviously Moorman and Miner are doing a non-Polanyian analysis of tacit knowledge by emphasizing its "socialness". The main motive behind this kind of mystification is difficult to identify, but it is obscure to what extent, if at all, these social structures have some existence independent of the knowledge that agents have about what they do in their day-to-day activity (cf. Giddens 1984, 26).

Social structures are made by knowledgeable agents positioned or "situated" in time-space to various kinds of *contexts.* According to Middleton and Edwards (1990, 1) the predominant focus of enquiry in the studies of human memory has been the study of memory as a property of individuals, or at the very best extending beyond individuals to include the *influence* of "context" on what people remember. In the cases of Walsh and Ungson and also of Moorman and Miner, the context is ambiguously conceptualized, making it difficult to understand how the context may or may not influence what people remember or forget.

According to the researchers of cultural-historical theory the context can be conceptualized in the form of an activity system. Taking this conceptualization into account, it is possible to see how remembering and forgetting happen within activity systems and how active individuals have a decisive role in these processes. On the other hand, remembering can be seen as making connections between one's head (procedural and declarative memories) and external memory aids (e.g. other people, writing things down, knotted handkerchiefs, alarm clocks and other cultural resources etc.) (Engeström, Brown, Engeström & Koistinen 1990, 140–143).

On the other hand, remembering (cf. Engeström, Brown, Engeström & Koistinen 1990, 140–143) can be seen as making connections between actions of primary and secondary remembering – between preserving (e.g. storing information and explicit knowledge) and retrieving (e.g. examining stored information or explicit knowledge and e.g. planning based on it). Primary remembering focuses on the individual object of the activity system in question, but secondary remembering takes the activity system itself as the focal point of attention. In a way we can say that the activity system remembers but it does not happen without individuals remembering with external memory aids.

According to Engeström, Brown, Engeström, Koistinen (1990, 140–143) forgetting is seen as breaches or ruptures in the connections between the internal image of the people memorizing and external memory aids and/or between primary and secondary actions of remembering. So forgetting can be caused by *organizational silence,*

over-individualism, interaction malfunctions and unsystematic acts of preserving. Interestingly the traditional "product" (i.e. storage bins) nature of organizational memory has been challenged by the "process" nature of organizational remembering and forgetting.

For organizations, as for example the FNDC, where the personnel[286] tends to be fairly frequently replaced, to remember organizationally means routinely *preserving* (producing external memory aids of the individual object but also of the whole activity system to be utilized in the educational planning processes of the future) but also *retrieving* (i.e. examining the stored information before and during the subsequent planning processes). It is almost needless to say, but preserving has to be done keeping the dangers of information overflow in mind. Hence, big conclusions and generalizations should be done but without loosing contact to the underlying information and data.

If we do, as most of the interviewees did (cf. chapter 7), accept the idea of the layeredness of the curriculum, we have to remember to *encourage* preserving acts on all levels of the curriculum. For the teachers this means how they are and will be *socialized to the teacher and research community of the FNDC*, how the tacit knowledge of the more expert teachers can be utilized by the arriving teachers, and how the collective progressive inquiries sustain the vitality of the knowledge base of the FNDC.

The close relation between memorizing and sensemaking should be noticed. According to Weick (1995, 17–62, 2001; Tuomi 1999, 240–245) sensemaking is a social, ongoing and *retrospective* process driven by plausibility where the organization enacts its identity. By memorizing the organization can understand where they were, where they are and who they are (identity).

The past oriented actions and activities need to be balanced by future oriented ones. The reason to do so is simply the fact that in every situation people produce part of the environment they face (Weick 1995, 20, 30; Giddens 1984). Therefore, it is reasonable for the organization to try to control the future emerging continuously within the personnel of the organization in question (i.e. the FNDC). For these kinds of purposes the organization needs a vision – a shared knowledge vision (Senge 1990; Collins & Porras 1994, 219–228; Collins 2001, 108–110; Wiig 2002; Nonaka & Toyama 2002; Nonaka, Toyama & Byosiere 2001) made within the organization. Not just the content of the knowledge vision but also *the method how it is elaborated and what the ensuing actions of the knowledge vision are*, are crucial and fundamental questions for the FNDC and also for the whole FMES.

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[286] At the FNDC especially the officers.

Chapter Nine
CONCLUSIONS

9.1. Research questions

The following research questions guided this research process:

- *Who* are the subjects of learning and knowledge activities?
- *What* do they learn?
- *How* do they learn and participate in the knowledge activities?
- *How* do we guide the transformation of the educational institution or is it a totally autopoietic issue?

9.2. Theoretical contribution

This study favors fundamental questions followed by at least tentative answers instead of exact answers to secondary questions. The main reason for this is the assumption that the right answer to a secondary question is also secondary, but the fundamental question, even when insoluble in its exact form, can give us fruitful insights, guiding us towards major discoveries and deep transformations.

The present study allows us to reflect on the shared beliefs of the essence of social sciences and it joins the discussions concerning the shared metatheoretical and philosophical foundations of the social sciences and more precisely of the military sciences at the FDF. It allows us to see the justifiability of the broad research program view instead of the fashionable "paradigmatic pipeline thinking" in the age of deepening systemness and increasing needs to get broader understanding of our current challenges and ways to solve these collaboratively. The study gives a useful example of a social scientific bridge building over the gaps between different spheres of live and competing "paradigms".

Although future oriented, the present thesis does not neglect the traditional premises of the social science; on the contrary it favors "old fashioned" scientific ethos, including for example constructively critical thinking based on careful analysis of the evolving facts that are criticized. For military sciences and to military pedagogy the chosen constructively critical stance means that the currently accepted interpretations of the organizational learning theories at the FDF are challenged. In other words some of the current cognitive trails are destabilized while the knowledge base of the FDF is extended towards

some of the most prominent research programmes in the field of organizational learning and knowledge studies.

In the field of knowledge management studies the study focuses on the first generation studies and especially on the interpretations made by Ikujiro Nonaka. Instead of just narrow SECI orientdness, the broad framework of Nonaka is carefully analyzed. The SECI model is reinterpreted as a SECA model and the knowledge creation theories are linked to the cultural-historical activity theories, to communication studies and to system sciences.

In the analysis the chosen theories are linked to the current teaching practices at the FNDC. This allows us to interpret more deeply the practical meaning of the abstract theories while aiming to transform Finnish military educational practices.

The constructively critical analysis has allowed the researcher to synthetize a novel framework that can be used also elsewhere in educational institutions (**figure 9.1** in subchapter 9.6). With the help of the framework it is easy to keep the fundamental questions in mind while struggling with the transformation of the educational institution.

After the educational institution has identified its main contradictions and paradoxes, they can be put into a solvable form along the identified key educational dimensions. Later in this chapter a practical example of the usefulness of dimensional thinking is explained (**figure 9.3** in subchapter 9.7). Also some strategic principles for educational reformers are elaborated on (see below in this chapter).

For the organization aiming to be a learning and/or knowledge creating organization, a robust epistemic infrastructure plays a pivotal role in these kinds of desires. Two alternative angles to see such an epistemic infrastructure are offered (figures 8.5 and 8.6). The study shows how the levels (or alternatively the spheres of the infrastructure) are potentially linked by the identified psycho-social processes of the learning-knowledge creating organization.

The synthetized theories allow us to reflect deeply on the human role in our contemporary societies and organizations; also in those claiming to be "static and stable" sailing on the tides of cultural evolution.

9.3. Practical contribution

The conducted Development Laboratory meetings and followed thematic interviews of the managers of the FNDC allowed us to face the current paradoxical and contradictive social reality at the FNDC.

The analysis persuades us to focus on the basic assumptions and beliefs of the soldiers at the FDF. The intent has been to make those serving at the FNDC and at the FMES more aware of the shared beliefs of the current managers and teachers of the FNDC. It is assumed that awareness of the beliefs of others allows us to change our thinking of e.g. static warrior premises, stability of the military bureaucracies, alignment of the beliefs and deepness of the current military educational "reforms". Potentially these individual and hopefully collective reflections have a fruitful influence on the ensuing learning actions and activities.

It was shown that instead of being fully controlled in top-down manner, the individual teachers play a pivotal role at the FNDC presently. They are already making departmental pedagogical innovations potentially diffused to the other departments of the FNDC or elsewhere at the FMES.

The elaborated Teacher's Self-evaluation Sheet and the developed Military Teacher Education Course are the most practical contributions of the present study. The sheet allows the teachers to explicitly grasp and externalize their personal beliefs and ideas about "good" expertise in military training and education, and can be used while socializing "newcomers" to the FNDC or to the FMES in general.

At the moment the younger generations of students, who are potential future teachers of the FNDC, are educated to use the Change Laboratory method effectively as a developmental tool for the purposes of the FDF and FBG. The gained experiences allow us to develop this kind of education both on the practical and on the theoretical levels.

9.4. Who are the subjects of learning and knowledge activities?

Now it is time to answer the posed questions and give some general guidance for the hopefully forthcoming *teachers' on-the-job education at the FNDC*[287]*.* Life-long teacher education is a necessary but not sufficient prerequisite for the future aligned educational reforms and transformations (cf. chapter 3). Therefore, the *progressively inquiring*

[287] The very first step in such education are the teachers' self-reflections assisted by the Teacher's Self-Evaluation Sheet. After the self-reflections', collective reflections are a fruitful next step. The double-hermeneutic processes are the key issue for the following steps of the teachers' education. For "novice" teachers the Military Teacher Education Course should be a compulsory one. Also the relative position of military pedagogy in the Senior Staff and General Staff officer education needs to be reconsidered. The pedagogical expert status of the Department of Education should be supported by all available means.

teachers of the FMES are *the subjects* of learning and knowledge activities (cf. **figure 6.1**). For the teachers of all disciplines at the FNDC this means that to be a teacher is to be a researcher at the same time.

Every teacher is also a leader, consciously solving his Soldier's Basic Paradox both individually and collectively. Therefore, the teachers' management and leadership development are essential parts of the teachers' on-the-job-education. The core expertise of the *peacetime*[288] military teachers at the FMES *should* be pedagogically, managerially and also leadership oriented.

It seems to be appropriate to recognize that behaviour and actions are understandable only when interpreted against the background of the entire activity system (Engeström 2001a). The dimension of impossibility and possibility emerged during the Development Laboratory meetings, caused by a secondary contradiction between the subjects and the community (cf. **figure 6.3**). The emergence of this kind of contradiction is understandable partly due to the teachers' unawareness of the managers' shared expectations and beliefs. According to the espoused beliefs of the managers the teachers play a central role in educational transformations. Now it seems to be the right time to turn these espoused expectations into systematic teachers' on-the-job education, especially when the alignment in research-based teaching seems to be the desired end at the FNDC.

In an organization wishing to be "a learning organization" in the future, a robust epistemic infrastructure (cf. **figures 8.5** and **8.6**) is an essential success factor. For the FNDC this means that it should balance its over-individualistic cultural stance by some kind of Training Portal-based expert or knowledge communities (cf. communities of practices; innovative knowledge communities) within the *research community at the FNDC and at the FMES*. Looking at the same organizational phenomenon but using alternative perspectives (cf. **figure 8.5** and **figure 8.6**), a shift of mind was aimed at. Despite of the chosen preferred perspective, the main idea intertwining the perspectives together remained the same – the multilevel (i.e. "multicircle") organizational *epistemic infrastructure can be linked together by psychological and social processes extending systematically to international communities and processes.*

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[288] The peacetime activities of the Armed Forces should not be neglected, as competent (e.g. also action competent) wartime units are trained and educated (i.e. produced) in peacetime to be used in times of crisis or ultimately in war. Therefore, it is logical to focus on peacetime activities first and on the basis of the "successfulness" of these, be prepared for wartime activities.

But although the subjects' behaviour and actions are understandable only when interpreted against the background of the entire activity system (Engeström 2001a), there is no activity without *an object*, and there is no object without an activity. In chapter 4 it was explained how we should actually have activities in which we are aware of their ultimate *outcome*[289]. The following subchapter will focus on the question of the outcome, but here the centralness of the object (i.e. the student) for the FNDC's activity system is emphasized.

In chapters 6 (excerpt 6.7) and 7 the heterogeneity of the current (2005) student population was shown by a study assisted by the Centre for the Educational Assessment of the University of Helsinki[290]. Naturally each student has to be met as he or she is, although our *beliefs* and *expectations* have *tangible* consequences (James 1890: 1950; Weick 1995, 146) as explained in chapter 8. Instead of focusing solely on the questions of "how has this kind of student been admitted to the FNDC" and "what kind of student is he or she actually", we should remember the most important question: "what is he not yet" (cf. chapter 4). Consequently, the teachers of the FNDC should take a close look at *the potential of the students*.

When facing the real nature of the operational environment of the soldiers, having always been a *dynamic entity demanding extremely active agents,* the words of colonel Douglas MacGregor (2003, 208), speaking of the US Armed Forces, clarifies the point: "It is unrealistic to expect that military leaders will demonstrate the requisite physical energy, mental agility, and moral courage in war to inspire subordinates to exercise initiative, to innovate, and to take risks if they have been discouraged from doing so throughout their military careers." For the teachers of the FNDC this means that despite of the heterogeneity of the students, each individual student has to be *responsible for his learning, and this means that he has to put all his resources to the full use while participating in the knowledge creating activities.*

But the students are not learning in a vacuum, nor are the teachers individualistic hermits. They act in the context of the FNDC and collectively their actions are understandable only when interpreted against the background of the entire activity system. Hence, the students and the teachers are *co-learners and co-inquirers in the research community, each participant helping others to reach their "best" and shaping the culture of the FNDC at the same time.*

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[289] In chapter 7 the current outcome, in the form of key result objectives, of the FNDC was questioned and criticized.
[290] The report is not publicly available at the moment.

9.5. What do they learn?

In brief, students at educational institutions learn "knowledge" and participate in "the knowing processes" while they should be creating knowledge (i.e. conceptual and systemic knowledge assets; conceptual artifacts). Ultimately, while participating in these kinds of knowledge activities they should be aiming at creating a new form of practical activity (Ahonen, Engeström & Virkkunen 2000, 291). At the FNDC this new kind of activity could be labeled as *knowledge creating activity* (cf. **figure 9.2** in subchapter 9.7).

The meaning of knowledge has evolved culturally since the Platonian times of "knowledge as justified true belief". Already the analysis of the first generation knowledge management researchers (cf. chapter 4) showed that nowadays knowledge can be seen as both a product and a process. In other words, when talking about knowledge, it is said to reside inside human beings, within their activities, being also a cultural resource (i.e. knowledge assets; conceptual artifacts). To some extent, and especially by adequate means, knowledge is really convertible but the main issue is not its convertibility, but its *disctinctiveness* and *coequality* when thinking about knowledge in a more *systemic* manner. In brief, each form of knowledge does work that the others cannot (Cook & Brown 1999; Tuomi 1999, 2002) and the complexity of these forms of knowledge is high, causing unmeasurability of knowledge at least by current methodologies.

Although knowledge seems to play an essential role in our successfulness, the processes of knowing are even more crucial for us, due to the fact that distinctive forms of knowledge have to be kept *resonating* within themselves. The resonation seems to be a rather abstract concept but by it several psychological and social processes can be referred to. Instead of some "generative dance" (Cook & Brown 1999) forms of knowledge resonate within themselves by the processes of

- Intuiting, anticipating, perceiving, believing; putting the doubt into productive use.
- Appropriating and cross-appropriating.
- Socializing novices into the practices by the experts of the community (not necessarily only by "old-timers" or "experienced nonexperts" (Bereiter & Scardamalia 1993; Bereiter 2002).
- Articulating, writing, drawing (i.e. externalizing) and effectively communicating.
- Memorizing (e.g. accumulating; sensemaking) or alternatively forgetting.

– Systematizing, integrating, routinizing (i.e. institutionalizing) but often also destabilizing.
– Learning, understanding and developing action competence.

One of the main challenges in the field of knowledge management studies is to develop means and methods to enable these kinds of *positive resonation processes to flourish also in all kinds of not-yet-intelligent/learning/memorizing organizations.*

One main aspect of knowledge needs to be highlighted. Knowledge is said to be a reality viewed from a certain angle (Nonaka & Toyama 2003; Takeuchi & Nonaka eds. 2004). Consequently, in knowledge creation (or in knowledge management if so preferred) one tries to see the entire social reality by interacting with those who see it from other angles. For the disciplines of the FNDC this means that the students have to get a contact with the main "paradigms" or research programmes of the discipline during their studies. But obviously they have to inquire "beyond" the "old" research programmes while progressively inquiring into the "new".

When focusing on such cultural and public resources as knowledge in the form of knowledge assets (e.g. conceptual and systemic) and conceptual artifacts, the certification practices play a pivotal role. By the certification processes (i.e. peer review processes) the legitimacy of the scientific *certified knowledge* ("savoir" in French) (Foray 2004, 6; cf. Foucault 1972, 16) can be *a posteriori* guaranteed. Not just outer scientific communities have the responsibility of the quality of the certified knowledge but the responsibility is shared by each, hopefully normatively (e.g. scientific ethos) guided, social scientist.

9.6. How do they learn and participate in the knowledge activities?

A condensed and synthetized answer to this question is presented in **figure 9.1** (Mäkinen 2005).

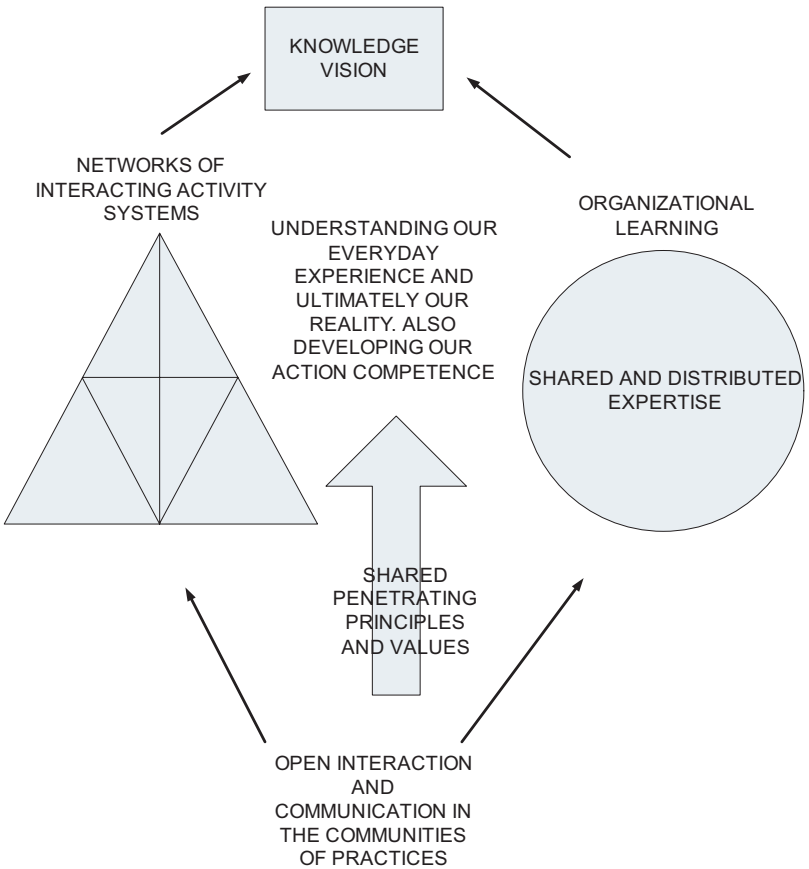

Figure 9.1 Synthetized framework for organizational learning and knowledge creation

The framework has been synthetized by using thesis (**figure 4.2**) and antithesis (**figure 4.4**) as combinatorial tools. The framework has been kept as simple as possible due to the bounded arationality of human beings. Despite of its simplicity, the framework allows us to keep the fundamental educational questions in mind during the transformational processes of the educational institutions.

The learning and knowledge creating activities are always *contextually situated* and hence the cultural features play an important

role in the organizational learning and knowledge creation activities. Surprisingly, "cultural barriers" slowed down the Development Laboratory process at the FNDC, and the teacher-researcher turned to thematic interviews of the managers of the FNDC. The *layered Scheinian cultural structure* (cf. **figure 4.1**) showed its relevancy and assisted in focusing below the espoused value statements all the way to *culturally evolving basic premises and assumptions of the warriors in machinelike bureaucracy* – or alternatively *soldiers in human (i.e. organic) organizations.*

The present study shows in practice how crucial it is to be reminded of the dialectics of effective communication and communication failures. It was stressed that the main question is not total avoidance of silence but the optimal level of silence and the optimal "distance" between discourse and practical activity. It was believed that also at the FNDC the teaching and researching practices should be accompanied and complemented, but not replaced or accomplished solely by talk. But the complementarity of the discourse is only a potentiality, and missing this point can sustain the organizational silence on the fundamentals, as in the case of the FNDC.

The "static warrior premises" were reinterpreted to be under continuous reconsideration. The case of obedience clarified the point. Of course also in the future soldiers and officers are expected to obey orders but this does not tell the "whole truth" of the case. The metatheoretical problem or paradox to be solved can be named as the Soldier's Basic Paradox[291]. Nowadays "obedience" needs to be reinterpreted, because every soldier is a leader (Brownlee & Schoomaker 2004) and the transactional leadership dimension needs to be balanced by the transformational leadership dimension (Nissinen 2001).

In chapter 8 the roots of *progressive-inquiry* learning were reinterpreted. The learning journey took us through Deweyn and Meadian insights to Batesonian, Argyris-Schönian, and Engeströmian "constructivist" theories. Along the journey some practical meanings of the analyzed theories were explained but by no means to a full extent. One reason for doing so was to destabilize the Kolbian and "constructivist" interpretations made in the FDF, and justifiably extend the knowledge base of the FNDC to be used in its pedagogical activities.

The misaligned consequences of habits need to be faced; not denied. Learning can be seen as *potentially expansive* action and activity, but often the beginning of the learning process is the most difficult in

[291] On the theoretical level this metatheoretical problem is akin to the Leader-Follower Paradox (cf. the Burns Paradox; the theoretical problem; Burns 2003, 171) emerging in the field of transformational leadership (Burns 1978, 2003; Bass 1998).

practice. Sometimes instead of reflective learning, nonlearning (i.e. presumption, nonconsideration, and rejection) or nonreflective learning (i.e. unconsiciously) seem to be the typical response to everyday experience (Jarvis 1987, 1992). The experiences gained from the FNDC (cf. chapters 6 and 7) clearly confirm the Jarvisian interpretation by showing how difficult the acts of questioning, criticizing, or rejecting some fundamental aspects of the accepted practice and existing "wisdom" on the social domain (i.e. publicly) can be.

According to Dewey "a problem well put is half solved". This makes sense when understanding that research programmes offer us theories to *see* and *solve* problems in our reality and social reality. **Figures 6.1** and **6.3** suggest or even propose some ill-defined problems at the FNDC. Not only Deweyan melioristic faith is needed to solve these problems, although we cannot fall into the optimistic passivity. Consequently, intelligent action and *human effort*[292] of each individual serving at the FNDC and at the FMES are needed also in the future.

Following the insights of Mead, Dewey and the developers of the progressive-inquiry learning it suffices to say that "we do not know what the solution will be, but we do know the method of the solution". For the teaching and practices of the FNDC this means progressive inquiries in all disciplines, but also a need for the *recontextualization and avoiding discontinuities-turn* (cf. Brown, Collins & Duguid 1989; Resnick 1987; Biggs 2003). Instead of being guided by the feedback of the military units and other profit centres of the FDF and the FBG, the FMES should be aware of how powerful an impact their activities have on the key resources (i.e. knowledge) of their "military consumers"[293].

In chapter 7 it was shown how the managers of the FNDC have identified the right formula mentioned in the footnote 293 below, due to the fact that the need of the students to learn to solve problems was emphasized. Obviously the problems of the FDF and FBG are often outside the FMES and the students have to learn to solve these already at the educational institution.

The *recontextualization turn* means also something else[294]. Quite often the knowledge taught in an educational institution is "inert" (Whitehead 1929) and not conditionalized (recontextualized) to show in what kinds of situations and how the theories may be useful. If then we hope and wish that in the future the officers will know the practical meaning of the theories, they will have to inquire into the

[292] Alternatively Finnish "sisu".
[293] In abstract terms this means a shift from A-> B to A<-> B.
[294] It means also much more as for example recontextualizing the assessment practices (cf. e.g. Biggs 2003, 184-191; Bransford, Brown & Cocking eds. 2000; see also the Learning Log mentioned in chapters 6 and 7).

practical meaning of the "abstract" theories, avoiding the inertness of the learned knowledge systematically. In each and every turn we have to understand the practical (cf. concrete) meaning of the abstract theories.

At an educational institution, such as the FNDC, the students and teachers learn while they create and build knowledge within the research community of the FMES. In some way the progressive-inquirers follow cognitive trails in the cultural environment. They go beyond a predefined set of alternatives rather easily. The transition from single-loop learning (cf. Learning II) to double-loop learning (cf. Learning III) can be done consciously by seeking progressively more and more well certified theories to be critically cross-appropriated and appropriated into the practice.

For the above kinds of inquiries, artificial borders between military and civilian sciences are often just an unnecessary hindrance. In the future some challenging questions will come to the fore: to what extent are international security organizations restricting or not the research domain of the Finnish military scientists and to what extent can the military scientific domain be reconsidered both conceptually and "non-conceptually" (cf. chapter 2) by the Finnish military scientists?

As **figure 9.1** proposes, our progressive inquiries can be guided by the knowledge vision. The exact meaning of the knowledge vision was elaborated on in chapter 8, and especially the "governing ideas" and value systems were stressed. Also the usefulness of public and cultural knowledge for the knowledge vision making activities was highlighted. The current experiences of the FNDC give some flesh on the bones of the idea. The FNDC has added the concept of "human security"[295] to its strategy (to the "knowledge vision"), presumably being followed by collective progressive inquiries into the phenomenon determining how the knowledge base of the FNDC and the FDF will be evolving in the long term. It seems to be obvious that the human security will be guaranteed by the collective effort of several administrative branches and non-governmental organizations. But what this kind of knowledge vision means to the FNDC and for the education of officers, needs to be elaborated on, because it will not emerge out of the blue.

To start the reconsiderations concerning the development of the military sciences further on, it will be useful to see both phase I and phase II type of research questions. In phase I the FDF trains and educates its war-time units during peace-time. The knowledge needs of phase I activities have to be filled partly by the knowledge creation

[295] In a parallel manner the FDF and also the FNDC have added the learning organization to their "knowledge vision".

activities of the FDF. In these knowledge creation activities cultural knowledge resources play a fundamental role, and the main task of the FDF is to make double hermeneutic processes and combinatorial innovations to be used for the purposes of the FDF and the FBG. This type of research activities resonate well with the Gibbonsian Mode 2 type of research (cf. chapter 2).

Phase I type of research has to be combined with phase II type of research. In a way the research of type II is made on the basis of the knowledge and understanding gained in type I research. "Non-conceptually" thinking it can be suggested that the domain of military sciences lies partly on actions and activities in the war-time operational environment. Conceptually thinking for example concentration on human phenomena can be justified as being a Finnish area of expertise also in times of deepening European security integration.

In chapter 7 it was said that pedagogical misalignment is a fact at the FNDC, but fortunately the needed alignment is a true possibility for the FNDC and for the whole FMES. The alignment can be achieved by learning; by deep learning. The key challenge of the FNDC is to allow systemic destabilization of its knowledge base on three essential levels – on the metatheoretical and philosophical, on the theoretical and paradigmatic, and on the practical level. On the practical level it needs to be understood that also the curriculum can be seen to have a multilayered structure (cf. chapter 7).

In practical terms this means for the FNDC that it has to clarify its *social scientific* foundations and not take the chosen "paradigms" for granted (e.g. military pedagogy; Deep Leadership) – the progressive inquiries play an essential role also in these cases. Hence, the above mentioned teachers' on-the-job education and other research activities play a pivotal role in the processes of turning misalignment into alignment.

According to Etienne Wenger (1998, 179), through alignment we become part of something big (e.g. the whole FNDC and the FMES) because we do what it takes to play our part in the *identified social landscape.* But who are we and can we renegotiate our identity as well as our cultural basic assumptions, "warrior premises" and authentic values (not only espoused ones)? Are we warriors, soldiers, boundary crossers or maybe even *bridge builders* between the distant cultural spheres of life participating in the activities of the human security?

9.7. How do we guide the transformation of the educational institution or is it a totally autopoietic issue?

Actually, when answering the other research questions, it was shown how the transformation of the educational system seems to be a real possibility. But something else needs to be emphasized about the controllability of social change. In this study the Giddensian angle to social change was identified as a solution for the need to understand what kind of a role human agents *could be* playing in the game of life. Seeing the social change from the Giddensian angle stresses the need to understand the intertwinedness of the disciplines of leadership and pedagogy, especially in an organization aiming to be a "learning organization". When continuing this multidisciplinary analysis, multilevelness comes again to the fore.

During this study the focus has been multilevelly on the present question of educational transformations. On the most simplifying level the endeavoured transformation can be described as a movement from A (the current state) to B (the endstate) by the use of Cs (e.g. by strategic means). The self-assessment tools of the TQM are to some extent useful in this kind of purposes but after the analysis has been done *it has to be generalized in a condensed form due to our bounded arationality*[296]*.* During the thematic interviews this kind of method was used both discursively[297] and also on paper[298].

"Below" the most simplifying level lies the level of the networked activity systems. The activity systemic analyses made during this process have been already introduced, (cf. **figures 6.1** and **6.3**) but an additional case can be introduced. In the autumn of 2005 the researcher arranged a military educational course for the senior staff officer course. **Figure 9.2** shows the recontextualized knowledge-creating idea of officer education.

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[296] If our cognitive capacity is bounded (i.e. the famous 7+-2 rule of Miller (1956)) on *all levels of our "epistemic infrastructure"* we should use this limited capacity to big/main/the most fundamental issues guiding our ensuing activities. After a while self- and collective reflections play a pivotal role and then we can check how well the emerged reality *fits* or *not* to the shared big/main/the most fundamental principles and values. If the conclusion is the misfit, then we should do correcting actions and activities.

[297] The researcher also asked the respondents to take in the first place a perspective not restricted to the departmental or even to divisional level.

[298] Each of the respondents got a suggestion to describe somehow on paper how he personally sees the present state at the FNDC (position A) and the desired future state (position B).

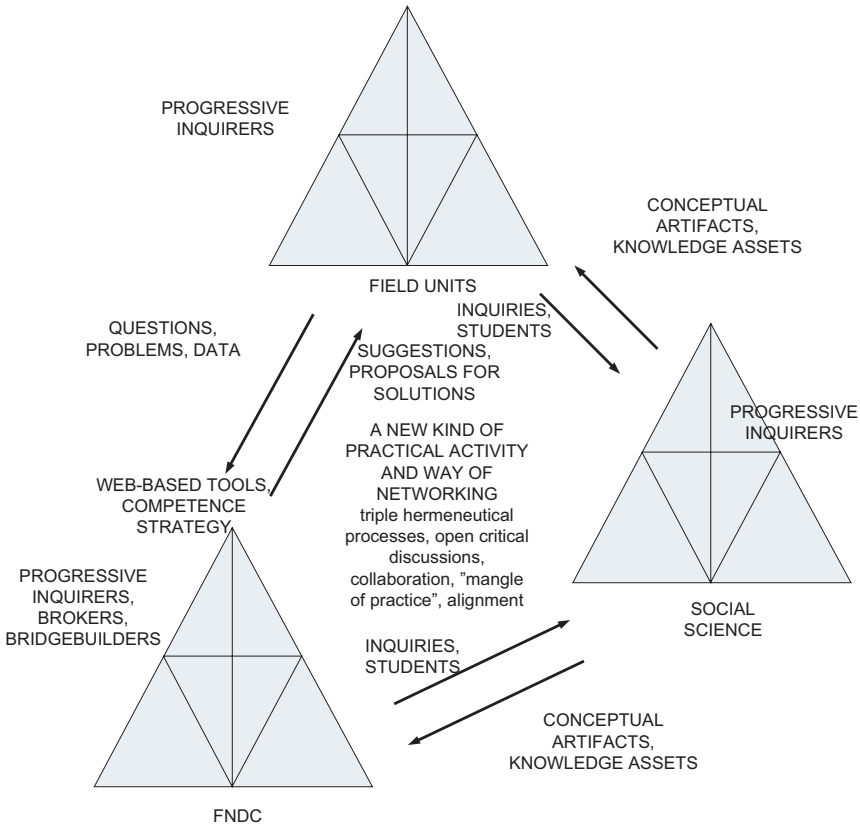

Figure 9.2 An example of the knowledge creating activity at the FNDC

During the course the students were *progressive inquirers* acting within the research community. In their field studies they followed how the research-based competence development strategy worked as a *boundary object*[299] between the activity systems. Somehow the boundary object in question moves through the chain of command, reinterpreted by the personnel and potentially influencing the organizations. In **figure 9.2** the new kind of practical activity (i.e. *the knowledge creating activity)* has got its shape, offering a *seed* or a germ cell for others struggling with same kinds of challenges of the needed recontextualized turn.

But still another level of analysis has showed its relevancy – the level of dimensions[300]. The example below (**figure 9.3**) shows the

[299] According to Star (cf. 1989, 37; cf. also Bowker & Star 1999) boundary objects are those objects that are plastic enough to be adaptable across several communities of practices, activity systems and multiple viewpoints, yet maintaining some sort of constant identity.
[300] The dimensions are: practice versus theory; old ("the given") versus new ("the produced and created"); individual versus community; local versus global; school versus work.

practical meaning of the dimensions in the case of Finnish web-based blended[301] courses.

Figure 9.3 The meaning of the key educational dimensions in the case of web-based blended education

With **figure 9.3** the researcher participated in discussions about the "answers to our pressing educational challenges". It was proposed that if the web-based blended courses are the answer to the pressing educational challenges, we will have to take a close look at the original and fundamental "pedagogical" questions asked. In other words the aim of this whole study is to identify fundamental questions rather than secondary ones. Not only questions have been posed but also some guidance for forthcoming progressive inquiries has been given.

Making good ethical decisions is such a complex task that although some general and strategic principles can be applied, we cannot reduce ethical action in the form of a "rule following behaviour". But this

[301] Web-based blending means a combined use of face-to-face, distance and self-learning (Kalliomaa 2003).

does not mean that we should forget the need to have some shared strategic principles offering guidance for the activities of the FNDC.

In chapter 8 it was mentioned that the relative importance of the "fourth level" above the Leont'evian three-level scheme seems to be increasing (cf. **figure 8.2**). To some extent the activity systems can be seen as guided by the "products" on the "fourth level". The strategic principles can be also situated on the "fourth level" and the main issue is the continuous and aligned processes between the four levels in the activity system of the FNDC.

The strategic principles can be put in the form of the following list[302]:

- The sphere of interests needs to be global, and ultimately the self-interests should be negotiated on a global level[303].
- Progressive inquiries are guided by the knowledge vision (i.e. guiding principles and shared values, visionary endstate).
- Multiperspectiveness and double hermeneutic, and in our case even triple hermeneutic processes towards "bridge building" transformations are needed.
- Despite of the sphere of interest we all are collectively responsible for this all and what is currently emerging among ourselves; it is our duty to turn misalignment into alignment, not just on paper but in practice.
- There is a real possibility of influencing social change collectively and making the needed transformations but they do not emerge out of the blue. Also in the future the "human touch" plays a pivotal role on the social change and also in the Armed Forces.

9.8. Reflection on the research process

This research process started from *the practices* of the FNDC, turned towards social scientific *theories* and then back to practices. Being ordered in 2000 to serve at the FNDC, the researcher concluded that his part-time teaching would be supported by *social scientific* PhD studies. Already from the beginning of the research process the paradox of the FDF and the FNDC alike espousing their *learning*

[302] The present list is by no means fully elaborated but despite of that, the fact of needed *global progressive-inquiries and bridge building activities also in the field of military sciences deserves being highlighted.*

[303] Allee (2003, 236-237) referring to the evolutionary biologist Elisabeth Sahtouris. Cf. the general principles of the integrative social contracts theory coined by Donaldson and Dunfee (1994, 1999). It is a generally accepted fact that self-interests and mutual self-interests or maybe even globally negotiated self-interests play an essential role in explaining the emergence and evolution of communication networks (i.e. links between us and others). For further reading see Monge & Contractor (2001, 2003).

organization likeness, being at a same time an undivided part of the culturally evolving Finnish *Knowledge* Society caught the attention of the researcher. The teacher-researcher felt a strong need to solve his *Soldier's Basic Paradox by visionarily seeking to synthesize these perspectives together.*

For the educational transformers this means a universal need to *synthetize perspectives* and *build bridges* across different research programmes. The gained experiences show how useful, and actually necessary, this way of acting is. One future challenge for the "distant" perspectives needs to be highlighted in the case of the educational institution.

Also at the FNDC *administratively* and *instructional-pedagogically* oriented collectives (cf. Bereiter 2002; Cuban 2004) coexist and will continue to do so also in the future. The administratively thinking people believed that the production of a new written curriculum would be the main issue of the educational transformation processes. They emphasized the need to count credits by the ECTS-system, also favoring the process-based view of the TQM.

On the other hand, the more instructionally oriented people believed that also other *levels would be needed.* They insisted that educational reforms should not be accretions around the cultural core (Tyack & Cuban 1995), but they seemed to believe in the passivity of "the prisoners of the culture", neglecting the possibility to seek some synthetized solution to the challenge. But if then instead of "rearranging the deck chairs on the Titanic" the administratively thinking persons could turn their attention to the "Titanic", namely to the matrix organization of the FNDC is a question worth asking.

When looking from the instructional perspective, even the imagined reformulation of the organization of the FNDC will not solve the instructional-pedagogical problems at the FNDC. This case highlights the point that even administratively oriented officers cannot totally reject the other main perspectives, or vice versa, in our social reality at the FNDC. Due to the fact that the perspectives may not even be *understandable* to everyone, the key challenge also in the future at the FNDC is to convince the others of the relevancy of the *instructional-pedagogical perspective at the educational institution.* If an instructional-pedagogical perspective is not needed at military educational institutions does it have any place in the FDF and should the FDF forget the espoused manifestations about the "learning organization-likeness"? This point clearly shows that "what way is up and who is the best" is always ultimately locally negotiated, although the ensuing actions and activities have at least global *unintended* consequences.

But obviously the teacher-researcher did not have any other possibility than to accept the felt and later identified misalignment currently at the FNDC. One way towards alignment went through the studies of the essence of social sciences, also allowing reconsiderations of the position of the military sciences on the social landscape.

The paradoxical situation (a learning organization in the Knowledge Society) did not let him to "just choose one paradigm"; he needed to choose several "paradigms", ultimately going beyond these towards research programmes and metatheoretical self-reflections[304]. Consequently, the researcher felt the strong need to act on the dimension of local and global while making sense of it. Hence, the researcher offers a broad view beyond "paradigms" towards research programmes and transdisciplinarity.

The double hermeneutic stance used in this study shows its meaningfulness because the collaboration, but also the resistance of the practitioners affected the theoretical and philosophical interpretations shown in this study. The dimension between impossibility and possibility emerged during the Development Laboratory meetings. On the other hand the researcher had to focus on the "warrior premises" and to the "organizational silence" studies to be able to explain the data collected during the Development Laboratory meetings.

Especially for the practitioners the talks about metatheorical and philosophical levels could sound rather abstract ones. The example of philosophical dialectical thinking clarifies the point. After the researcher started to understand the meaningfulness of dialectical thinking he could compare some "thesis" to some "antithesis" (i.e. counterargumentative thought position) while making a bridge building action by his "synthesis". Examples of this are the discussions about intelligent organizations and *not-yet-intelligent organizations.* Another practical example of the importance of the metatheoretical level is the critical and metatheoretical stance towards the theories potentially cross-appropriated.

The analyses in chapters 4 and 8 clearly show that the chosen research programmes in the field of organizational learning and knowledge creation (cf. building) are not incommensurable. The identified perspectives are actually more or less combinatorial, allowing us to make sense of a wider systemic epistemic infrastructure. No uncorrectable communication problems existed in the chosen field. The research programmes discussed within themselves and they shared

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[304] Later the researcher learned to conceptualize his experiences in the form of following cognitive trails by i.e. socially navigating with the *prestigeful* social scientists.

a common language. The often critically oriented discussions were put into a productive use in this study.

This study does not tell the "whole truth" of the case. It may not even have identified all the fundamental questions to be asked and answered. But it offers a "truth" when looking into the phenomena by the synthesized perspectives chosen for this study[305]. "The synthesized truth" in this case is connected to our social reality by several kinds of cognitive trails[306], e.g. sociological and system scientific research can be mentioned. For example the theoretical analysis of contradictions was *connected* to sociological studies, leading to taking a close look at the nature of social change[307]. Another example is the link to system sciences. Claiming that also systemic thinking is culturally evolving (cf. **figure 4.3**), the basics of the main ideas behind the paradigms of systemic thinking were introduced. After following such cognitive trails it came possible to focus on the essence of societal change and to the role played by us in it. *Consequently, the uncontrollability assumption was justifiably challenged*.

Following Mertonian scientific ethos, the researcher has moved along the dimension of the local and global, being *constructively critical.* During the research process the researcher acted as an active co-participant in the emerging research community at the FNDC. A lot needs to be done in the future also in this case but by "human effort", deepening double hermeneutic processes and bridge building activities between the disciplines, inside and outside the FNDC, a fruitful development can be guaranteed in the future.

[305] Cf. the Kuhnian "consistency" explained in chapter 2.
[306] Cf. the Kuhnian "accuracy" explained in chapter 2.
[307] Cf. the Kuhnian "broad scope" in a sense of potentially having consequences far outside of the FNDC; cf. chapter 2. The Kuhnian "simplicity by bringing order" was partly done by the *synthetized figures* (cf. e.g. **figure 9.1**). To what extent this study is fruitful in the Kuhnian sense is left to be judged by the readers.

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THE STRUCTURE OF THE THEMATIC INTERVIEWS

The theme of this interview is the development of the teaching practices at the FNDC.

I ask you to firstly to take a wider perspective not restricted to the departmental or even to the divisional level but to the FNDC as a whole, having connections to the Defence Staff and the Ministries (especially the Ministry of Defence and Ministry of Education). In the end there are some questions concerning your department or division. But for a start let us have a more systemic angle.

1. How does the administrative position of the FNDC affect the development of the educational practices at the FNDC; does the position of the FNDC cause some challenges; how about opportunities?
   a. How would you express the leading idea of the FNDC (*cf. chapter 3 etc; the idea of guiding principles*)?
   b. Is/should be?
2. How do you see the consequences to the educational transformations of the FNDC as it is a university controlled by the Ministry of Education but is not led by the Ministry of Education?
   a. How essential are the FINHEEC's evaluations of the FNDC in your opinion? (*cf. the USMO paradox: a military organization but on the other hand a scientific institution)*
3. What are the main reforms in officer education caused by the so called Bologna process?
   a. Do you see that some means and methods to renew the teaching practices at the FNDC have been neglected in the process – does the FNDC transform as it should and what could be done otherwise or even better next time? (*cf. the claimed learning organization likeness*)
   b. How would you comment on the layeredness of the curriculum (written, taught, learned) and its meaning to the educational transformations? (*cf. chapter 3, 7 and 8)*
   c. How do you see the role of the teachers in the Bologna process? (*cf. e.g. chapter 3)*
4. How would you describe the unique characteristics of the FNDC and how do these characteristics influence the Bologna-process at the FNDC?
   a. What are the unique characteristics of the Finnish officer education worth sustaining and why? *(cf. e.g. the identity questions dealt in chapter 8)*

b. Have we lost or going to lose the connection to our unique characteristics and if so, why?

5. Let us assume that the core idea of the developmental activities is to develop the present state (A) to the desired future state (B): how do you describe the A and the B?
   a. Please answer on the separate sheet of paper (*aiming to explicitly reveal the current beliefs of the managers of the FNDC)*
6. How would you crystallize the guiding vision and its meaning for the FNDC? (*cf. e.g. chapter 4)*
7. In the White Paper (2004) it is claimed that the FDF operating culture is being developed on "learning organization" principles. How do you see the meaningfulness of such a claim? (*cf. e.g. chapter 4)*
8. What do you estimate the effects of the deepening internalization to be on the teaching practices of the FNDC in the future? (*an interplay between the local and the global of the social theory of learning; cf. subchapter 8.6)*
   a. Cooperative relationship with the US Armed Forces?
   b. With the European security structures?
   c. With the Nordic Armed Forces? (*cf. chapter 8: "communities of practices could be also deliberately created in a top-down manner")*
9. How do you describe the main *outcomes* of the education at the FNDC? (*cf. Engeström's activity system model;* ***figure 4.4****)*
   a. Teaching the teaching objectives?
   b. The officer 2010/2020 competencies?
   c. How do you see the meaningfulness of the so called ethical dimension? (*cf. the concept of action competence of the military pedagogy; chapter 7)*
10. How would you compare the present and future officer candidates (e.g. a cadet)? (*cf. Engeström's activity system model; the object;* ***figure 4.4****)*
    a. How will these features affect the educational transformations?
    b. It is often said that students are active and the duty of the officer is to be an active; what does this mean to you and what could it mean to the officer education in general?
11. What are the main objectives of officer education? (*cf. Engeström's activity system model; the outcome;* ***figure 4.4****)*
    a. How about the main result objectives?
    i. The amount of graduated students and the level of the feedback?
    b. Are the objectives appropriate and central in your opinion?
    c. The quality of teaching is being discussed: what does this mean to you?

12. What are the core principles currently used in the controlling of the decentralized FMES? (*cf. the content of the vision and the knowledge vision; e.g. chapter 4)*
    a. What is your view on the idea of values guiding our actions?
    b. What are the core principles that should be used in the above issue?
    c. Do some administrative norms (SOPs, laws, decrees, rules) restrict the possibilities to offer good education and training?
13. How do you see the role of the FNDC in guiding the branch and service schools in educational matters? (*cf. the content of the vision and the knowledge vision; e.g. chapter 4)*
    a. Should the guiding role of the FNDC be developed further and if so, how?
    b. Could you see that so called communities of practices could intensify this guidance? (*cf. chapter 8)*
14. How would you describe the collaboration between the FNDC and the military units concerning educational activities?
    a. Can we take the competence needs of the military units sufficiently into consideration? (*cf. the generations of the CHAT; networked activity systems; chapter 4)*
15. How do you analyze the interaction between scientificness and professionalism?
    a. Is one or the other emphasized over the other? (*cf. how to deal with the identified USMO paradox?)*
16. If we separate what is studied from how it is studied, what are the most important principles in order to (*cf. chapters 4 and 8*)
    a. Enhance learning?
    b. What is the meaning of "learning"?
    c. Students will learn to learn and develop their competencies in the workplaces?
    d. What is the role of web-based blended education for the transformation of officer education?
17. What are the principles of choosing the taught content? (*cf. chapter 2)*
    a. What are the principles of choosing e.g. the books to be read?
18. How do you define the possible needs to develop students' assessment practices? (*cf. chapter 8)*

The rest of the questions concern your department or division. (A proposal for those serving on a divisional or a departmental level)

19. How would you crystallize the main pedagogical principles of your department/division/the FNDC? (*cf. e.g. chapters 3 and 4*)

20. Could you give some examples of how the teachers of your department/division/the FNDC have developed their teaching during the past years? *(cf. chapter 3)*
21. How would you crystallize the way the teachers of your department/division/the FNDC have developed their competencies during the past years? (*cf. chapter 3)*
22. How has your department/division/the FNDC utilized research to develop the teaching practices during the past years? (*cf. e.g. chapter 1)*

TEACHER'S SELF-EVALUATION SHEET

For self-evaluation and peer/superior-evaluation.

	+ or + +		- or - -		Practical developmental considerations
A) self-knowledge and willingness to develop one's know-how as a teacher					
1. willingness to be a teacher, which can be seen in one's behaviour (actions, attitudes; "ethical dimension")					
2. self-evaluates one's teacher competencies					
3. acknowledges one's strengths and weaknesses as a teacher, aiming at developing one's teacher competencies continuously					
4. is able to receive feedback also concerning one's weaknesses					
B) knowledge of teaching and education					
5. knowledge of the students: awareness of the knowledge, skills, attitudes and needs of the students as a starting point for a teaching					
6. capability to utilize students' competencies (~know-how) and knowledge in teaching practices					
7. treats one's students as peers and future colleagues					
8. knows the learning objectives and aims of teaching as well as the relevant result objectives, taking them into considerations in one's teaching					
9. links one's teaching to the different operational environments of officers (the modules) and to the requirements posed by these environments					

C) knowledge of the content					
10. masters the know-how and know-that of one's discipline					
D) didactic skills; teaching skills					
11. is an effective and self-regulated planner of one's teaching					
12. is able to explain to the students how the studied content is linked to the previously studied and to the core content of the discipline					
13. is able to explain the meaning of the taught content; neglects “inert” knowledge					
14. is competent to guide one's students to the level of deep learning in know-how and know-that type of knowledge					
15. is able to keep the students interested and motivated to learn					
16. is able to motivate the students to ask questions; is able and willing to answer students' questions					
17. is able to create an inspiring and interactive studying climate					
E) evaluation/assessment skills – ability to give fruitful feedback					
18. is able to guide one's students to self-reflection and constructive critical thinking					
19. is able to assess/evaluate the level of the learning of one's students and guide the learning of the students through feedback					
F) teaching methods	used methods		Practical developmental considerations		
20. is able to illustrate his/her teachings					
21. is able to utilize various teaching methods, taking into consideration the content, the students, the learning environment, and the learning objectives within the allocated time					

22. is able to utilize the ICT-infrastructure currently available				
G) knowledge of context (based on peer-evaluation)				
23. is networked to and collaborates with the teachers and experts of other departments, divisions and educational institutions (i.e. of the FDF) in instructional matters				
	with whom?		Practical developmental considerations	
24. collaborates with outside experts (i.e. experts in the Armed Forces and civilian organizations)				
	with whom?		Practical developmental considerations	
25. is able to perform the administrative duties of teachers				
H) interaction and collaboration skills (based on peer-evaluation)				
26. acts effectively as a member of the teacher-team, teaching/research group and teachers' communities of practice				
27. is able to act in a flexible manner also in times of rapid changes of teaching arrangements				
28. is reliable in agreed issues				

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