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EMANCIPATING AND DEVELOPING LEARNING ACTIVITY:

SYSTEMIC INTERVENTION AND RE-INSTRUMENTATION IN HIGHER EDUCATION

by

Sebastian H.D. Fiedler

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From the Centre for Learning Research
University of Turku
Finland

Supervised by:
Academy Professor Erno Lehtinen
Centre for Learning Research
University of Turku
Finland

Reviewed by:
Professor Juha Suoranta
School of Education
University of Tampere
Finland

Professor Heli Ruokamo
Centre for Media Pedagogy
Faculty of Education
University of Lapland
Finland

Opponent:
Professor Juha Suoranta
School of Education
University of Tampere
Finland

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This work is dedicated to my parents Henriette and Detlef
... and their unconditional love and support.
Together with my sister Stefanie they have always been there for me
... no matter what.

Abstract

The central theme of this thesis is the emancipation and further development of learning activity in higher education in the context of the ongoing digital transformation of our societies. It was developed in response to the highly problematic mainstream approach to digital re-instrumentation of teaching and studying practises in contemporary higher education. The mainstream approach is largely based on centralisation, standardisation, commoditisation, and commercialisation, while re-producing the general patterns of control, responsibility, and dependence that are characteristic for activity systems of *schooling*. Whereas much of educational research and development focuses on the optimisation and fine-tuning of *schooling*, the overall inquiry that is underlying this thesis has been carried out from an explicitly critical position and within a framework of action science. It thus conceptualises learning activity in higher education not only as an object of inquiry but also as an object to engage with and to intervene into from a perspective of intentional change. The knowledge-constituting interest of this type of inquiry can be tentatively described as a combination of heuristic-instrumental (guidelines for contextualised action and intervention), practical-phronetic (deliberation of value-rational aspects of means and ends), and developmental-emancipatory (deliberation of issues of power, self-determination, and growth) aspects. Its goal is the production of orientation knowledge for educational practise.

The thesis provides an analysis, argumentation, and normative claim on why the development of learning activity should be turned into an object of individual|collective inquiry and intentional change in higher education, and why the current state of affairs in higher education actually impedes such a development. It argues for a decisive shift of attention to the intentional emancipation and further development of learning activity as an important cultural instrument for human (self-)production within the digital transformation.

The thesis also attempts an in-depth exploration of what type of methodological rationale can actually be applied to an object of inquiry (developing learning activity) that is at the same time conceptualised as an object of intentional change within the ongoing digital transformation. The result of this retrospective reflection is the formulation of "optimally incomplete" guidelines for educational R&D practise that shares the practical-phronetic (value related) and developmental-emancipatory (power related) orientations that had been driving the overall inquiry.

In addition, the thesis formulates the instrumental-heuristic knowledge claim that the conceptual instruments that were adapted and validated in the context of a series of intervention studies provide means to effectively intervene into existing practise in higher education to support the necessary development of (increasingly emancipated) networked learning activity. It

suggests that digital networked instruments (tools and services) generally should be considered and treated as transient elements within critical systemic intervention research in higher education. It further argues for the predominant use of loosely-coupled, digital networked instruments that allow for individual|collective ownership, control, (co-)production, and re-use in other contexts and for other purposes. Since the range of digital instrumentation options is continuously expanding and currently shows no signs of an imminent slow-down or consolidation, individual and collective exploration and experimentation of this realm needs to be systematically incorporated into higher education practise.

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Sebastian H.D. Fiedler, May 2012

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List of original publications

Publication 1: Fiedler, S. (2003). Personal webpublishing as a reflective conversational tool for self-organized learning. In T. N. Burg (Ed.), *BlogTalks: European Conference on Weblogs* (pp. 190-216). Wien: Cultural Research - Zentrum für wissenschaftliche Forschung und Dienstleistung.

Publication 2: Väljataga, T., & Fiedler, S. (2009). Supporting students to self-direct intentional learning projects with social media. *Journal of Educational Technology and Society, 12*(3), 58-69.

Publication 3: Fiedler, S., & Pata, K. (2009). Distributed learning environments and social software: In search for a framework of design. In S. Hatzipanagos & S. Warburton (Eds.), *Handbook of Research on Social Software and Developing Community Ontologies* (pp. 145-158). Hershey: IGI Global.

Publication 4: Fiedler, S. H. D. (submitted). *Emancipating learning activity in the light of the digital transformation.*

Publication 5: Fiedler, S., & Väljataga, T. (2010). Interventions for second-order change in higher education: Challenges and barriers. *Electronic Journal of e-Learning, 8*(2), 85-92.

Publication 6: Fiedler, S. H. D., & Väljataga, T. (2011). Personal learning environments: Concept or technology? *International Journal of Virtual and Personal Learning Environments, 2*(4), 1-11.

1 Introduction and overview

1.1 Overarching theme and structure of the thesis

The central theme of this thesis is the emancipation and further development of learning activity in higher education in the context of the ongoing digital transformation of our societies. This theme was developed in response to the highly problematic mainstream approach to digital re-instrumentation of teaching and studying practises in contemporary higher education. That approach is largely based on centralisation, standardisation, commoditisation, and commercialisation, while re-producing the general patterns of control, responsibility, and dependence that are characteristic for activity systems of *schooling*. Whereas much of educational research and development focuses on the optimisation and fine-tuning of *schooling*, the overall inquiry that is underlying this thesis has been carried out from an explicitly critical position and within an alternative framework of action science (Handlungswissenschaft). It thus conceptualises learning activity in higher education not only as an object of inquiry but also as an object to engage with and to intervene into from a perspective of intentional change. The knowledge-constituting interest of this type of inquiry can be tentatively described as a combination of heuristic-instrumental (guidelines for contextualised action and intervention), practical-phronetic (deliberation of value-rational aspects of means and ends), and developmental-emancipatory (deliberation of issues of power, self-determination, and growth) aspects. Its goal is the production of orientation knowledge (Orientierungswissen) for educational practise.

The inquiry underlying this thesis has developed over a considerable period of time and within various contexts of educational practise and research. Its progression wasn't always straightforward and the exemplary products that make up the underlying publication portfolio reflect different developmental stages and different strands of the overall inquiry. Bringing them together in this thesis made a considerable amount of reflection, re-evaluation, re-construction, and re-interpretation necessary. While the compartmentalised nature of this work was partly due to the specifics of its biographical context, it also reflects conceptual and methodological challenges and developments that can be attributed to the accelerated socio-technological change and transformation it was (and continuous to be) embedded in. This ongoing transformation can be characterised as a co-evolutionary drift of continuously expanding, digital networked technologies and the instrumentation options they provide on one side, and emerging and developing human practises and dispositions on the other. In the light of this ongoing transformation it seems impossible to construct final universal answers. What can be produced, however, is "optimally incomplete" orientation knowledge for educational practise and its further development. This is where this thesis intends to contribute.

Structure of the thesis

The remaining text in Part 1 summarises the research questions that were guiding the overall inquiry underlying this thesis. Furthermore, it provides an overview of the historical development of the inquiry.

Part 2 examines the notion of turning developing learning activity into an object of inquiry and intentional change. It draws upon some core concepts and insights from cultural historical activity theory and develops an argument for the re-instrumentation and further development of learning activity through intervention into the current practise within higher education.

Part 3 is dedicated to a methodological reflection on the notion of intentional change and intervention in educational research and development. It is largely based on the comparative analysis of a variety of approaches that had been influential in different phases of the overall inquiry. Furthermore, it reviews some explicit proposals for addressing value-rational contents of practise and intervention and proposes an outline for systemic intervention research in education.

Part 4 provides a condensed overview of the publication portfolio. It summarises the purpose, methods, findings, and the historical context and contribution to the overall inquiry of each publication.

Part 5 offers a general reflection on the overall inquiry, its implications and possible directions for further research and development.

1.2 Guiding research questions and challenges

The overall inquiry was guided by the following set of research questions and challenges:

What cultural-historical developments make learning activity an increasingly important object of inquiry and change?

How can educational R&D practise methodologically pursue such an object of inquiry and change, within the ongoing digital transformation?

How can we effectively intervene into existing practise in higher education to support the development of (increasingly emancipated) learning activity in the light of the ongoing digital transformation?

- What are effective levers and instruments for change?
- What typical challenges occur in the context of such interventions and need to be addressed?

Since the inquiry developed over a considerable period and was distributed over a variety of practise and research contexts its products tend to address these questions in various degrees of explicitness.

1.3 Historical development of the overall inquiry

The prelude of this dissertation project dates back to the late nineties. I had the chance to complete my studies in Psychology in Erlangen, Germany, and

Cardiff, UK, at the University of Georgia, USA, where I went through the MEd Instructional Technology programme and also worked as a research assistant in the Learning Performance Support Lab. At that time, the instructional technology field was heavily invested in the combination of instructional design methods with the creation of new types of digital contents, and interactive delivery mechanisms on the computing platforms of that time. It was the heyday of software tools like Director and Authorware that allowed for the authoring of complex, interactive, instructional materials and systems that made use of the growing digital, multimedia capabilities. In this period, the Web started to mature, too. However, bandwidth-limitations were still a significant bottleneck and often forced instructional designers to fall back on dissemination strategies that made use of storage media like CD-Roms, Zip-Discs, and so forth, to install or run contents and applications on a local computer.

All in all, instructional design and technology as a professional field basically operated on the model that highly trained specialists (instructional designers, content experts, programmers, graphic designers, and so forth) would pool their expertise in multi-disciplinary teams to run everything from front end analysis to the final production of instructional materials and -systems. The "learners" were mainly envisioned and conceptualised as consumers or users of those products. Influenced by my earlier studies in humanist psychology, adult education, personal construct psychology, radical constructivism, and so forth, I often felt at odds with this general mode of operation and its underlying set of assumptions.

The Web as an emerging networked, and rather egalitarian platform for computing and communication drew my attention much more than the production of instructional software applications or stand-alone multimedia packages. The completely accepted, and steadily widening gap, between the competencies of educational and technological professionals on one side, and mere recipients of their end-products on the other side, just didn't seem to fit my own educational philosophy, ideas of human change and growth, and understanding of adult learning and development. Curiously, the instructional design and technology experts never seemed to use their own products and solutions if it came to their own, ongoing, professional development.

Additionally, from my perspective the whole traditional, instructional design approach seemed rather costly, time intensive, slow, and increasingly out of tune with the intensifying discourse around the implications of an accelerating pace of information and knowledge production, increasingly individualised patch-work biographies, and the need for continuous, personal development through intentional study and practise in adult life. It seemed to work well in settings were "training" was the focus. It somewhat also worked in formal school settings that ran on the notion of a fixed curriculum, but it

seemed less adequate in settings that had the (higher-)learning of adults on the agenda.

Thus, I tried hard to connect themes and concepts that had a considerable history in psychology and education, such as ideas around the fostering of self-direction in (adult) learning, with the emerging range of instrumentation options. At this time the production and dissemination of high-quality, web-based materials required quite a bit of training in the use of specialised software tools and knowledge about how to make them work together. The production of large scale, cutting edge websites and web-based systems occupied sizeable teams of professionals in industry and academic work settings.

Therefore, it was an eye-opening experience when I first got in contact with dynamic webpublishing practises. Around the turn of the millennium more and more server-hosted applications became available that offered basic content production and publication features right through the browser. The predominantly collective authoring of wikis, and the predominantly individual authoring of weblogs became the flagship instantiation of this new breed of applications. The latter publishing practise also spearheaded the wide-spread use of simple, standardised, XML data formats, like RSS, that made the published contents machine readable, and thus ready for aggregation, re-publishing, filtering, sorting and so forth. Without getting too deep into the formal and technical particularities here, it seems fair to say that the instructional and educational technology establishment initially ignored this development entirely, while the computer science people completely misunderstood and under-estimated the importance of these type of applications for the further development of the Web as a platform of human production beyond the rather narrow confines of the programming and scripting community. In fact, this camp often ridiculed the new practises, since they didn't seem to offer anything "new" from a computer science standpoint. However, they should turn out to be the forefront of what was later labelled Social-Software, Web 2.0, Social Media, or more recently the Social Web.

In retrospect, the emergence and co-evolutionary development of these instruments and publishing practises around 1999 and 2000 can be seen as the approximate starting point of my engagement with the overall theme underlying this study. In 1999 I graduated from the MEd in Instructional Technology program at the University of Georgia, USA, where I continued to work for another 6 months at the Learning Performance Support Lab before I returned to Germany in the summer of 2000. There I finished my German degree studies in Psychology, while I started my own business as a human centred-design, information architecture, and usability specialist for industry. In parallel I kept experimenting and engaging with the personal webpublishing movement and started to explore its potential for educational purposes

together with a small community of international educators and researchers.

In 2002 I carried out a first intervention study together with Priya Sharma from the Instructional Systems department of Penn State University, USA. We re-designed a Master-level course at Penn State University, introducing personal webpublishing practises through a cluster of inter-linked, individual weblogs, as a reflective, conversational tool for carrying out and supporting (personal) learning projects. In 2003 I joined the Media Pedagogy chair of Gabi Reinmann at Augsburg University, Germany, where I continued with the same line of practical intervention work and small-scale research. In general, I re-designed and facilitated a series of Master-level courses (on various topics) in a such way that given teaching and studying practises were disrupted and that the emerging webpublishing practises became a significant instrument for the re-instrumentation of learning activity in these contexts. In the winter of 2005-2006 I extended this work to the Media Pedagogy programme at the University of Innsbruck, Austria.

From 2003 on I also tried to expose my work to international peer review and critique. While the educational technology establishment still largely ignored the potential of the emerging instrumentation options at that time, the dissemination and further development of social media tools and practises progressed and accelerated significantly. In this period I focused mainly on self-publication through my own personal webpublishing outlets and on the presentation of peer-reviewed conference papers to reach an international audience. Due to my full-time work as a self-employed user-centred design specialist for industry I had limited personal resources to dedicate to my educational R&D efforts in those years. Thus, I predominantly engaged in practical intervention work in higher-education and the publication of conceptual papers that tried to illustrate the general rationale behind, and the potential of, using social media to re-mediate teaching and studying practise in higher education. In retrospect, I failed to produce publications that made an effort on delivering a detailed documentation and analysis of the empirical aspects of my work. Article 1 of the publication portfolio represents exemplary work from this period (see Graphic 1 below). Additional contributions were published in a variety of conference proceedings (see for example Efimova & Fiedler, 2004; Efimova, Fiedler, Verwijs, & Boyd, 2004; S. Fiedler, et al., 2004; S. Fiedler & Sharma, 2005b; Sharma & Fiedler, 2003, 2004a, 2004b).

In 2005 I was also invited by the Centre for Social Innovation (ZSI) in Vienna to take part in a proposal for iCamp, a large-scale, international R&D project in the Technology Enhanced Learning track of the 6th Framework Programme of the European Commission. When the project proposal finally won the funding I was recruited by the ZSI to lead the conceptual, pedagogical work package of the project and to become its overall educational manager. iCamp had the very ambitious goal to integrate a number of contemporary

themes in educational R&D at that time. On one hand it was meant to explore the potential of the emerging palette of social-software and social media in higher education, and on the other hand it was supposed to focus in particular on open source and open access applications, and their further development, or enhancement, through increased inter-operability. This included the integration, or rather combination, of the new breed of social media applications with legacy systems (such as Learning Management Systems) that could usually be found within the landscapes of tools and services in higher education. In addition, iCamp was loaded with the, rather political, programmatic goal of making a particular effort to integrate higher education institutions from the (at that time) new European member states into its practical interventionist fieldwork.

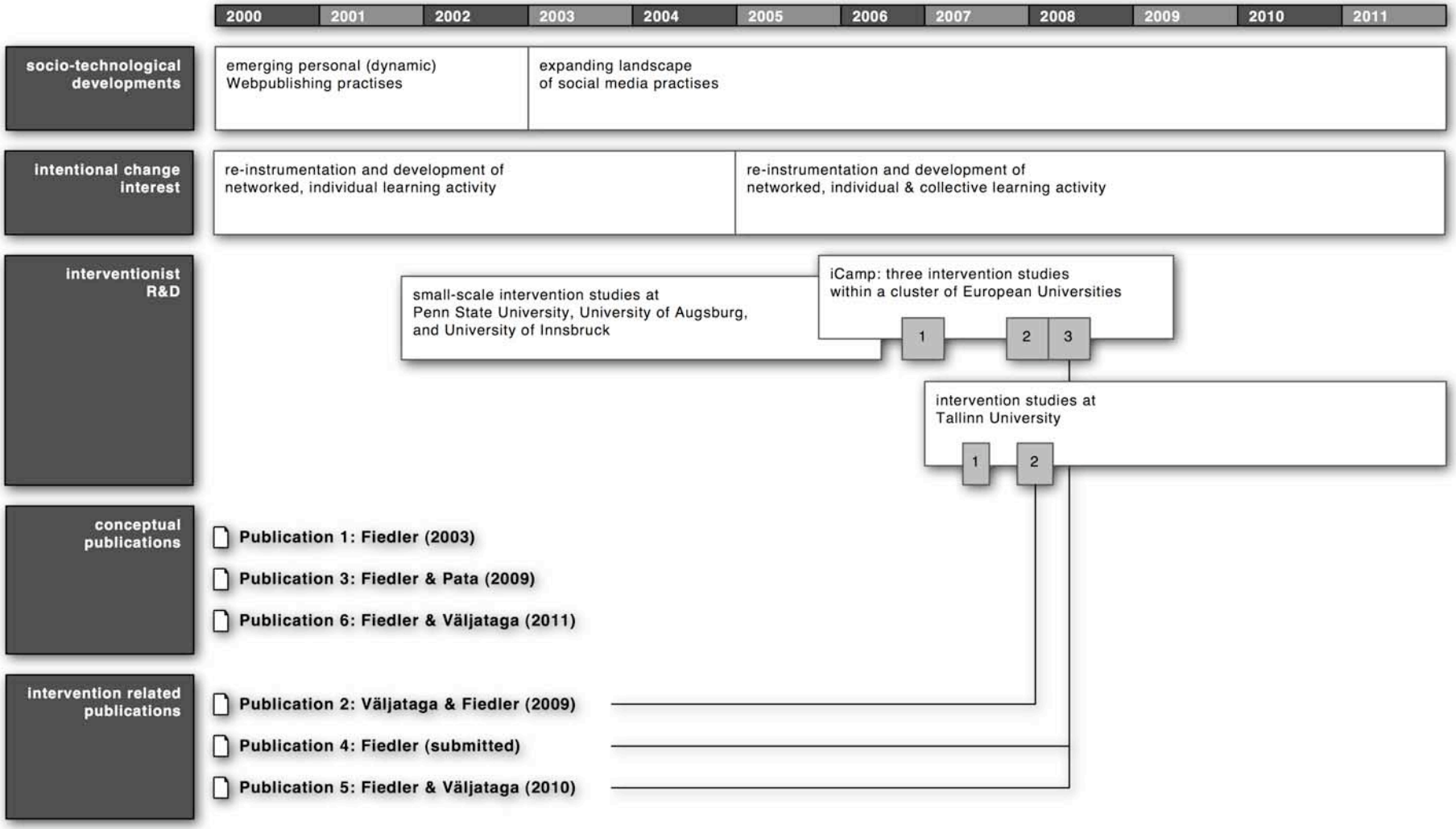
My new engagement as a full-time researcher in this large-scale, international research project, resulted in a widening of the scope of my personal R&D theme and in a shift to more challenging intervention studies. Gradually, the (further) development and re-mediation of collective learning activity became more important in this context. Conceptually, and methodologically, the context of a highly distributed, international, and inter-institutional research project, offered countless challenges for maintaining a personal line of research and its attached knowledge-constitutive interests. Partially, this is reflected in particular conceptual shifts, or shifts of terminology, in this stage of my work. Some of them can be attributed to a progressive development of my own theoretical and methodological instruments, while others might rather reflect the constraints of working within large-scale, interdisciplinary, applied research projects that are financed and contracted by external funding bodies, such as the European Commission. In such a context it is inevitable that one sometimes loses against and has to compromise with competing perspectives, agendas, world-views, philosophies of science, and various forms of disciplinary socialisation.

During the run-time of iCamp from late 2005 to early 2009 the project carried out three inter-institutional, international, intervention studies that varied in scope, focus, and in respect to the specific combination and elaboration of instruments. Part of the mandate of the iCamp project was the systematic integration of higher education institutions from (at that time) new European Union member states and the cross-institutional implementation of our fieldwork. This, of course, meant that we could not focus our intervention efforts on one particular local setting. Instead, we had to intervene in parallel into a cluster of institutions and their local teaching and studying practise. Article 4 and 5 of the publication portfolio are directly related to the iCamp project and its international intervention studies (see Graphic 1 below).

In the context of iCamp, some researchers at the Centre for Educational Technology of Tallinn University, Estonia, became key collaborators within

the conceptual educational work package and the interventionist fieldwork carried out by the project. In fact, from 2007 on we managed to establish a series of small-scale intervention studies at Tallinn University that tried to re-use and validate conceptual ideas and practical intervention instruments that had been tested in the context of the larger, international studies of iCamp, in the local context of Tallinn University. This branch of R&D outlived the iCamp project and is still continued, while I am writing this text. Article 2 of the publication portfolio is mainly related to the intervention studies carried out at Tallinn University. Article 3 and 6, however, summarise some conceptual developments and deliberations that were derived from the engagement in both strands of interventionist research activity (see also Graphic 1 below). In addition, I authored and co-authored a variety of international conference papers (see for example S. Fiedler, 2007a, 2007b; S. Fiedler & Kieslinger, 2007; S. Fiedler & Väljataga, 2008; Kieslinger & Fiedler, 2006; Kieslinger, Fiedler, Wild, & Sobernig, 2006; Klamma, et al., 2006; Väljataga & Fiedler, 2008, 2011a, 2011b) and reports to the European Commission (S. Fiedler & Kieslinger, 2006; S. Fiedler, Kieslinger, Pata, & Ehms, 2009; S. Fiedler & Pata, 2007) that were directly related to this work.

Graphical overview



(Graphic 1: timeline of inquiry)

2 Learning activity as an object of inquiry and intentional change

2.1 The cultural-historical context and ongoing developments

Rückriem (2009) only recently reminded us that digitalisation "… has penetrated every societal process and every societal activity system" (p. 88) and that "global digitalization and networking represent the specific 'leading' and epoch-making medium of our present time and provide totally new and rather inexhaustible potentials to human practice" (p. 89). We currently cannot grasp, let alone predict, the direction and extend of all related transformation processes. The emergence of a new "leading" or even "dominating" medium undoubtedly poses formidable developmental challenges for individuals and current activity systems. Individually and collectively we seem to be living through a transition phase that produces mounting tensions and some outright contradictions within existing systems of human activity.

The emerging leading medium is gradually changing what we perceive as potential objects of activity and what artefacts we can turn into mediating instruments for our actions. This process needs to be understood as co-evolutionary in nature. Human needs, imagination, and activity (Tätigkeit) co-evolve and shape the further development of the leading medium, just as much as they are shaped by the leading medium and its evolving range of instrumentation options. Through this interplay the cultural-historical development of human societies is taking on a global, inter-connected quality that is fundamentally changing the dynamic of societal change. A steadily growing number of world citizens experience how the digital realm is penetrating or absorbing more and more activities in their life. They experience, and experiment with, the introduction and expansion of digital instrumentation of all types of human practises within the workplace, in their social life with friends and family, related to hobbies and leisure, and so forth.

Since we still seem to be in the early transitional stage of the ongoing transformation, we need to expect a considerable disparity in developmental trajectories of "living *in* and living *with* the digital realm" and the speed of change between and within different areas of human activity. In many ways we can currently witness how more and more areas of human activity get gradually augmented and transformed by first getting into contact with and later by getting "morphed" in large parts into the digital realm. In early stages of this process the dominating developmental move seems to be the search for and acquisition of functional equivalents (email replaces letters or phone calls), then new configurations of instruments are explored, and finally new affordances (potentials for action) emerge through a co-evolutionary development of the dominant medium and human dispositions.

While many laymen, for example, do not (yet?) think of computational hard- and software, or the Web, as possible instruments to be drawn into

sports, it doesn't mean that it hasn't already become possible. In many cases it is already done in the more professionalised levels of this field of human activity, and at least prototyped and tested for wider dissemination. A recent example would be a sports-article producer putting sensors into its running shoes that interface with multi-functional, portable devices of a computer and consumer electronics company. This rather simple interface opens up wider ecology of computing platforms and software applications that can be used for the further re-instrumentation of the actual sports practise. The recording and production of music, in contrast, has already seen wide-spread dissemination of increasingly affordable specialised hard- and software, thus allowing for a revolutionary spread of amateur creation, remix, and co-creation on a quality level that in previous years had been only accessible to professional actors in the field. The digitisation of music has not only radically changed, and democratised, the production process, it also spurred the development of new forms of networked, inter-action and collaboration. Of course, we can find a similar, or even more advanced, level of developmental change in relation to the overall digitisation and networking transformation in the workplace. In particular, areas of work that base their practise largely on the manipulation of symbol systems, and information artefacts of various kinds, were the early targets for digitisation and mediation with networked instruments and technologies. Banking and trade, for instance, are premier examples of areas of work practise that have changed dramatically within relatively short periods of time.

Altogether, post-industrial societies have seen a dramatic shift towards more symbolically mediated and information driven work processes. In fact, in an abstracted and general sense one could even speak of an overall increase of "constructive"- or "design"-practises that rely on the production of novel artefacts in the ongoing work process. Architects, for example, produce technical drawings and sketches, psychologists create diagnostic reports or treatment plans, and programmers develop new prototypes. A common characteristic of these activities is an evolutionary design- and development process that inevitably produces regular challenges and demands for change and "learning". The progression of design- and development processes, however, is generally hard to predict, since goals and strategies and expectations have to be adjusted and changed over time. Authentic challenges and tasks often require collaboration, communication, the execution of actions under (at least partial) uncertainty, and a working style that has been described as bricolage (J. S. Brown, 1999). Bricolage refers to the localisation, selection and combination of artefacts and objects (things, tools, documents, programme-code, etc.) in a novel context. The systematic integration of other accessible and networked minds and their knowledge and skills, becomes an additional core component for successful problem solutions in such

information-intensive work settings (see for example Hutchins, 1991, 1995).

Thus, technologically mediated forms of networked co-operation and collaboration and the self-formation and self-direction of intentional change projects rise in importance in many work and life settings where mere factual knowledge or established procedures are only the starting point but not the solution to most authentic problem situations. This has also been acknowledged and extensively treated by some scholars in the area of vocational education. In this area more contemporary conceptualisations of *competence* explicitly emphasise the role of dispositions like orientations, values, and volitional aspects for successful self-organised action under uncertainty, instead of the mere application of procedural skills and factual knowledge which made up the core of the old concept of *qualification* (Erpenbeck & Heyse, 1999; Erpenbeck & Rosenstiel, 2007; Heyse, Erpenbeck, & Michel, 2002; Jünger, 2004; Rychen, 2003; Schäffter, 1998; Weinert, 2002). In a similar vein (Hakkarainen, Palonen, Paavola, & Lehtinen, 2004), for example, have addressed the ongoing co-evolutionary change of work (its composition, structure, instruments, and so forth), societal demands, human competencies, and the steady expansion of digital and networked technologies, under the label of "networked expertise," emphasising a multi-disciplinary approach that brings together psychological, educational, philosophical, and sociological viewpoints. While these authors welcome the "new opportunities for improving cognitive, and facilitating human development" (p. 219) that the emergence of a networked (knowledge) society provides, they also rightfully remind us:

> The knowledge society is not, however, a paradise and it never will be one. There is a great deal of inequality, and many hindrances to human well-being have to be solved in order to build a road to the future. Both human and cultural prosperity may require a new balance between work and private life, work and leisure activity, individuals and communities, and self-transcendence and self-fulfilment (Hakkarainen, et al., 2004, p. 220).

It should be noted here that the accelerated digitisation and networking seems to function primarily as a catalyser (and not a simple cause) for these cultural-historical developments and the diverse individual and social phenomena that emerge in their context. How to address these co-evolutionary developments conceptually from multi-disciplinary viewpoints, however, has remained a rather controversial issue.

2.2 The activity concept in the cultural-historical school of thought

The interdisciplinary cultural-historical school of thought has developed a variety of concepts and analytical tools to address the dialectic nature of the co-evolutionary, socio-cultural development on the individual and collective, societal layer (Roth & Lee, 2007). Its core concept is the notion of human

activity, a term that continuously produces confusion and misunderstanding because of the impossibility to differentiate properly in English between an organism's general mode of being active (German: Aktivität) and the specific human form of being active (German: Tätigkeit). The cultural-historical school of thought treats *work* as the specific human form of being active. The nature of human work is the conscious and intentional adaptation of nature (and society) to human needs and marks the (cultural-historical) departure of mankind from its mere evolutionary adaptation to nature (a notion that had been postulated by Karl Marx). The concept of activity (Tätigkeit) is then used as a (psychological) abstraction of *work*. Within psychology this perspective was initially elaborated and applied by Vygotsky (1962, 1978) and Leontiev (1978) and their disciples and collaborators.

Activity (Tätigkeit) is the specific human form of being active (Aktivität), changing the environment and oneself at the same time. Activity (Tätigkeit) is thus the specific human form of mediation (Vermittlung) between subject and object (Gegenstand). *Object* is another term within this school of thought that is frequently misinterpreted (see for example Kaptelinin, 2005). Object (Gegenstand) should be rather understood as a somewhat systemic concept here, since human beings have the capacity to turn, in principle, anything into an object (Gegenstand) of their activity (Tätigkeit), including concepts of self, their thinking, and forth, that is part of their experiential sphere. The (phylogenic and ontogenic) emergence of specific qualities of the human psyche, however, is seen as products of cultural-historical development. These qualities emerge within and through human activity (Tätigkeit). The (social) individual appropriates her (cultural) environment, and forms her mental capacities, initially always within collective, shared, and cooperative activity (Tätigkeit). Collective activity requires the formation of a collective subject that consists of cooperating individuals who adapt their motives, goals, and so forth, accordingly. Collective activity requires communication for its regulation and orientation. Communication is mediated (vermittelt) by signs and sign systems that become increasingly complex and generalised (e.g. as languages and script) within cultural-historical development. Thinking and the use of mental tools of any kind, in turn, is understood as the (ontogenic) interiorisation of collective (and cooperative) action mediated by language - a form of inner speech (Vygotsky, 1962).

Human activity, however, is not only mediated by signs and sign systems. Humans are ample users, and makers of all types of cultural instruments. Thus, artefacts (tools, concepts, methods, and so forth) in general play an important, mediating role in human activity and its orientation and regulation. Over time, shared instruments (within all kinds of human activity) become an important part of the cultural-historical fabric of human societies. They function as an objectification (German: Vergegenständlichung) of accumulated competence

(knowledge, skills, attitudes, and so forth) and expertise. Individual subjects, in turn, need to appropriate these instruments again within collective activity, before they can become (cultural) toolmakers themselves.

2.3 Learning activity as a product of cultural-historical development

From a cultural-historical perspective it is important to distinguish between learning as a process and learning as activity (Tätigkeit). Fundamental processes of learning are part of the biological make-up of human beings. They allow for an active, flexible adaptation to the environment through the modification of behaviour. Through cultural-historical development, however, humans have increasingly shaped and changed their environment and society and objectified their collective accomplishments through the production of artefacts and cultural instruments of all kinds. While *learning* (as a process) was historically embedded in collective (work) activity (Tätigkeit), it slowly emerged as a specific activity (Tätigkeit). Lompscher & Hedegaard (1999), for example, describe learning activity in the following words:

> It is a special kind of activity directed towards the acquisition of societal knowledge and skills through their individual re-production by means of special learning actions upon learning objects (subject matter methods and knowledge). Confronted with a certain subject matter area, learners can acquire skill and knowledge within a subject matter area only by actively acting with the material according to its substance and structure (contents and methods). The learners have to actively reproduce what society has produced in the historical process (p. 12).

Erdmann & Rückriem (2010) propose that the development of learning activity was closely tied to the emergence and dissemination of the "print and book culture" and its accompanying societal challenges and demands. The earlier forms of learning that were mainly contextualised in collective (work) activity (Tätigkeit) had been tied to personal experience and (local) social practise. The book, as the new leading medium, enabled the development, objectification, and dissemination of de-contextualised knowledge that allowed for new forms of cultural production and re-production. This de-contextualised knowledge was increasingly appropriated under the systematic guidance of teachers. This teaching-learning system was institutionalised in the form of schools. Over time the development of public, compulsory schooling ensured that learning activity (for an historic reconstruction see for example Fichtner, 1996) became the dominant form of cultural appropriation through learning.

Learning activity, as a product of cultural-historical development, needs to be formed and developed just as any other human activity (Tätigkeit). While human activity is generally directed towards the adaptation and shaping of the natural and societal environment, conscious, intentional learning activity is fundamentally directed towards the change of the "inner environment" (Giest,

2006) of the (learning) subject, to enable her to meet societal demands (of work and interaction). However, initially learning activity (Lerntätigkeit) and its cognitive pre-requisites need to be formed and developed in relation to specific objects (Gegenstände) within collective, shared activity.

This has become the focus of research and development efforts within areas of educational psychology that explicitly work within the cultural-historical school of thought (see for example Arievitch & Haenen, 2005; Arievitch & Stetsenko, 2000; Davydov, 2008; Giest, 2004, 2007; Hedegaard & Lompscher, 1999; Lompscher, 2006). Proponents of this line of research conceptualise the required cooperative activity as the formation of a pedagogical, collective subject consisting of a teaching subject and a community of learning subjects (see for example Giest, 2006). The teaching subject primarily provides the cultural instruments (artefacts, signs, etc.) that are needed to engage cooperatively and communicatively (or conversationally) with the specific object (Gegenstand) of the shared activity. The "learning" subjects need to appropriate the specific object (Gegenstand) of the shared activity and the cultural instruments being applied to the object within cooperation. The cooperation (and its instruments) between (the more competent) teaching subject and the learning subjects need to be interiorised to develop learning activity. The cooperative and communicative actions that regulate and orientate shared activity thus become mental instruments. Inner "speech" increasingly mediates intentional actions (Handlungen). The individual subject can converse with oneself to regulate and orientate also individual learning activity.

Without a detailed discussion of the different lines of research that have developed within this general, cultural-historical school of thought, it should be noted that its theoretical and empirical work focuses mainly on the formation (Ausbildung) and development (Entwicklung) of learning activity within the constraints of the institutionalised activity system of schooling. The presence of a pedagogical, collective subject that is comprised of a teaching subject on one side, and learning subjects on the other, appears as an unquestioned assumption and pre-requisite for the development of learning activity via the interiorisation of shared, cooperative activity. To be fair, it has to be attested that mainstream pedagogy, educational psychology, educational technology, instructional design, didactics, and so forth, is predominantly concerned with fine tuning and supporting the functioning of the overall activity system of schooling, regardless of its theoretical orientation. What is strangely amiss within the cultural-historical conceptualisation of learning activity and its development is a critical review of its postulated pre-requisites, the type of learning activity (and its instruments) that individuals actually interiorise within the activity system of schooling, and the possibility of its further development and transformative change in adulthood, inside and

outside of formal educational activity systems.

In particular, the conceptualisation of the teaching-learning (or rather studying) activity as a shared, cooperative activity with a collective subject appears to be rather idealistic when compared with the reality of institutionalised, activity systems in formal education. Such systems are the product of long periods of cultural-historical development. They have developed rather complex, differentiated structures, and semi-autonomous sub-systems that tend to operate on, and are mediated by, established sets of instruments, roles, rules, and typical patterns of division of labour. Can we really conceptualise the interaction of teaching and studying practise in formal education as being dominated by the formation of a collective subject that engages in shared, cooperative activity? What about issues of power? What about the typical distribution patterns of control and responsibility? Is teaching activity generally concerned with supporting the development of learning activity as a means to change oneself?

There is reason to believe that quite often teaching and studying practise in formal education might be more adequately described as two coupled and complementary activities (Tätigkeiten), instead of shared and collective per se. Especially in the higher levels of formal education it is generally assumed that individuals have successfully developed learning activity, acquired its mental prerequisites, and appropriated a wide range of relevant cultural instruments to go about changing themselves in response to the cultural demands presented to them within the system of schooling. Regarding the selective nature of higher education systems in the developed world, there is reason to believe that (young) adults who manage to enter higher education, by and large, have indeed developed learning activity to a level that enables them to regulate and orientate their (learning, …or rather *studying*) actions individually, and to engage with a wide range of objects (Gegenstände) in culturally acceptable ways.

While from an observer's point of view the development of learning activity doesn't seem to be a general concern or challenge within higher education, there is considerable evidence that for many individuals learning activity (Lerntätigkeit) -as the attempt to bring about systematic, intentional change on oneself- remains coupled to, and dependent on, organised teaching activity. That means that many ("schooled") adults are entirely capable of carrying out individual learning activity successfully, albeit only within the structural constraints that an educational authority provides as the subject of a corresponding teaching activity. Though they are able to regulate, orientate, and direct the necessary (learning) actions within a fixed range of freedom, important structural elements of their overall learning activity remain other-organised (see for example Candy, 1991, 2004; Harri-Augstein & Cameron-Webb, 1996; Harri-Augstein & Thomas, 1991; L. Thomas & Harri-Augstein, 1985, 2001). Thus, these structural elements (such as the object (Gegenstand),

resources, or criteria for evaluation) are not constructed collectively and cooperatively, they rather get defined by the subject of the teaching activity. This often holds true even in settings that foster collective learning activity among cooperating or collaborating (learning) subjects.

Higher education leaves this form of *unemancipated*, individual (and collective) learning activity that was often interiorised by individuals over decades of formal schooling too often unchallenged, or even re-produces and reinforces it. The ongoing transformation of the higher-education systems in Europe (Bleiklie, 2004) with its push towards more standardisation, continuous evaluation, accreditation, and accountability, actually seems to enforce the characteristic structure of *schooling* as the dominant form of educational practise. This inhibits and limits individual and collective development in an era that cannot rely anymore on the mere acquisition and appropriation of established public knowledge (Paavola, Lipponen, & Hakkarainen, 2004), pre-selected, arranged, and mediated within the institutional systems (of education). In the light of the wide ranging changes in work and other areas of human activity (Hakkarainen, et al., 2004) and the accelerated expansion of the public (mind)pool of objectified and materialised cultural instruments and products, new cultural-historical forms of learning become necessary. Learning activity, understood as the specific cultural-historical form of intentional human learning, thus needs to be gradually *emancipated* from teaching activity and the systemic and structural assumptions that dominated (and continue to dominate) the notion of schooling as the undisputed and leading format of changing and cultivating the self in response to the societal demands of the "book culture" (Erdmann & Rückriem, 2010; Giesecke, 2002).

If learning activity (Lerntätigkeit) has indeed developed into the main instrument to adapt, shape, and change the self, according to cultural demands and human needs, it also seems of paramount importance to ensure that our educational practise supports the further emancipation, development, and re-instrumentation (conceptually and technologically) of learning activity in the context of the ongoing societal transformation and the emergence of global digitalisation and networking as the new leading medium. Thus, educational research and development practise needs to construct the development of learning activity as an explicit object of inquiry (Forschungsgegenstand) and change. It needs to explore how it can help to establish and shape the conditions for its development in an increasingly networked and digitised world. This is most likely achieved through the establishment and support of a *transformative* type of (collective) learning activity that firstly attempts to address unemancipated learning activity as an object (Gegenstand) of intentional change (including its re-instrumentation), and secondly tries to develop qualitatively new forms of emancipated learning activity.

2.4 Re-instrumentation and emancipation of learning activity in the wild

In the early 2000s an accelerated expansion of networking and digitalisation as the new leading medium (Rückriem, 2009) found its expression in the explosive dissemination of small, decentralised and only loosely-coupled tools and services that provided individuals (and groups) with powerful means to augment a wide variety of activities. In this realm, personal and collaborative webpublishing activities like weblog or wiki authoring, webfeed publication and aggregation, social bookmarking and so forth, became iconic practises (Mejias, 2005). This group of tools and services was initially labelled *personal (dynamic) webpublishing*, then increasingly interpreted as *social software* (see for example Hippner & Wilde, 2005; Tscherteu, 2003), though definitive boundaries of the meaning of these terms were never quite established. In fact, over time other terms like *Web 2.0* and *social media* gained successive popularity. Many lightweight, cost-efficient systems and tools have emerged in this context, including varied content management systems, content syndication and aggregation services, and a range of tracking and mapping tools of hyperlink economies and social networks (Paquet, 2003). These tools offer powerful means for the support of collaborative and individual work (and study) activities that adhere to the patterns of contemporary information-intensive design and development work outside of formal educational settings. Without getting into the details of the development of this landscape of networked tools and services, it is important to note that quite naturally an "avant-garde" of individuals started to apply these emerging means in creative ways to support informal learning projects of all kinds and the advancement of their personal dispositions (knowledge, skills, orientations, and so forth). Within the framework of the cultural-historical school of thought one could describe this as a (initially rather experimental) re-instrumentation of their learning activity with these new means.

From an observer's point of view these individuals apparently gained the means and capabilities to construct, maintain their personal landscapes of tools and services. They made use of these networked tools and services to establish new relationships and to construct extended social networks to support their own educational projects. They took responsibility for all necessary instructional functions such as selecting and acquiring of material resources, pacing and monitoring themselves, establishing criteria of evaluation, generating feedback, and so forth. These people appeared to follow their individual interests and needs, periodically joining projects, groups and alliances but essentially operating most of the time from a psychological perspective of autodidaxy (Candy, 1991) - albeit a new, networked, and open form of autodidaxy.

From a technical point of view the patterns and practises were made

feasible through a constantly expanding and evolving palette of rather generic tools, services and devices. In fact, the accelerated pace of development in this realm turned any description of concrete tools and services as an instantiation of an exemplary personal landscape into a mere momentary snapshot. The iconic tools, services and practises of the early 2000s (wikis, weblogs, webfeeds) have been complemented, extended, and elaborated by a myriad of new applications and an increasing array of small, portable and networked devices (such as smart-phones, PDA, Pads, and so forth), thus creating a whole range of additional opportunities for the instrumentation of (inter-)action and conversation.

It is not the focus of this project to examine and describe the phenotypical details of particular instrumentation options within the current state of the digital realm. The speed of the ongoing development makes this appear to be a rather futile enterprise. However, it is important to note here that the amount and quality of affordable, small, networked, and interoperable tools and services seems to be constantly increasing, thus dramatically reducing the need for large, expansive, and centrally hosted systems. The emergence of affordable, small, portable devices is only accelerating this trend. The digital augmentation of individual and collective learning activity will undoubtedly follow this dynamic development. I have argued elsewhere (Efimova & Fiedler, 2004; Efimova, et al., 2004; S. Fiedler, 2003b; S. Fiedler & Sharma, 2005b) that the evolving digital instrumentation options are well suited to support a more reflective-conversational approach to learning and change, emphasising the ongoing conversation with self, others and artefacts, and the co-creation of artefacts as instruments of co-operation and co-production. Already the authoring of weblogs in combination with the surrounding practises of webfeed monitoring, reading and aggregation, social bookmarking, and so forth, could be meaningfully conceptualised from such a perspective.

At the core of this development lies the ever increasing individual and collective capacity to record and/or (co-)create representations of actions (productive and conversational), processes, experiences, concepts (ideas, abstractions), locations, natural objects, physical artefacts, and the self, in (semi-)universal digital formats. These digital artefacts, in turn, can then be published, shared, connected, copied, processed, (co-)edited and elaborated, re-created, and objectified (in the physical realm), thus unfolding qualitatively new instrumentation options for mediating conversational and productive (inter-)action with oneself and others. In principle, this development seems to open up a rather boundless horizon for the re-instrumentation of existing human activity and the (experimental) development of entirely new forms of individual and collective activity. Though it seems appropriate to still characterise the current phase of the ongoing digital transformation of society as "transitional", it becomes increasingly visible that the digital realm functions

as a "convergence engine" and major catalyser for the further development of human activity in general, and emancipated (new forms of) learning activity in particular.

Outside of institutionalised education this development is already taking place. However, it is also apparent that the self-directed instrumentation of emancipated learning activity "in the wild" produces particular patterns of control and responsibility, ownership, provision, and so forth, that compete with, contrast, and contradict the patterns that are still driving institutional practises in formal education. Thus, introducing practises that strongly depend on open, distributed, networked, rather public and transparent forms of conversation and co-operation into formal educational settings, creates considerable difficulties and tensions.

2.5 Re-instrumentation of teaching- and learning activity in higher education

From a cultural-historical point of view it is apparent that educational institutions have cultivated elaborate systems around a number of core activities (and their objects) over time. These activity systems tend to absorb new instrumentation options (from the digital realm) while leaving the general patterns of control and responsibility (rules, division of labour, etc.) largely untouched (Westera, 2004). Control and provision of instruments (for its core activities) by the institution and/or its representatives has been a dominant pattern for centuries. Thus, it comes with little surprise that the overall system tended to "process" emerging developmental offers in the digital realm accordingly. The result was the creation of Learning Management Systems and a palette of digital instruments to be used within teaching- and its closely coupled form of learning activity. In fact, Learning Management Systems (LMS) were (and to a large degree still are) often regarded as the main digital platform for supporting, organising, and mediating teaching and studying practises within higher education (see for example S. Brown, 2010; Browne, et al., 2010; Browne, Jenkins, & Walter, 2006; Coates, James, & Baldwin, 2005; Jenkins, Browne, & Walker, 2005; Paulsen, 2003).

The overriding design principles of these systems could be described as an unequal distribution of power and ownership with a clear distinction of roles (such as educational authority vs. participants). Expert instructional designers and course facilitators guide the participants through a sequence of pre-structured events and interactions with pre-selected materials towards a set of pre-defined instructional goals. They are mainly designed to manage the teaching of codified knowledge and skills, following a traditional instructional design approach of clearly outlined objectives, sequencing of events and interactions, pre-selected materials, structured content, and a clear distinction between educational authorities and students and their respective

responsibilities. This approach is also reflected in international standardisation efforts such as the US Department of Defense sponsored SCORM (Sharable Content Object Reference Model) project (http://www.adlnet.gov/) or the speifications published by the IMS Global Learning Consortium (http://www.imsproject.org/).

LMS systems are continuously expanded to include new modules and functionalities. However, very few of the LMSs currently in use provides interfaces for interaction and data exchange within a wider ecology of open tools and services (beyond the standardisation efforts of LMS vendors and developers). The majority operates as rather "closed clubs" and allows users only to act within the boundaries set by the system. While some higher education institutions have initiated some change efforts in recent years (see for example Franklin & van Harmelen, 2007) the mainstream scheme of provision and application of digital instruments in higher education can still be described as a combination of institutionally hosted and maintained LMSs, Learning Object Repositories, and Library Systems (see for example Browne, et al., 2010; Browne, Hewitt, Jenkins, & Walker, 2008 for an overview of the higher education lanscape in the UK). Instead of turning these institutional platforms into "equal players" within the rather open landscape of loosely-coupled tools and services (Wilson, et al., 2006), there is an observable trend towards the attempted assimilation of formats and functionalities into the existing institutional landscapes that were successfully prototyped in informal settings (for example, student weblogs can be authored within a LMS module). That this mere re-modelling is influencing and rendering individual perspectives on ownership, empowerment, competence advancement, and so forth, is often readily ignored.

This predominant institutional approach to technological support of teaching and studying, contrasts sharply with the major socio-political transformation process that has changed, and is still changing, the demands and challenges in work-life. It also contradicts in many ways the significant socio-technological developments that have produced an array of networked social media and software providing individuals and collectives with powerful means to augment a variety of practises - including learning activity (Downes, 2005). In publication 6 (S. H. D. Fiedler & Väljataga, 2011) I have argued, for example, that the emergence of the counter-concept *Personal Learning Environment* can be partially attributed to the tensions and contradictions that an increasing number of individuals experienced in relation to this centralised approach to digital (re-)instrumentation of teaching and learning activity.

In general, however, it appears that higher education has mostly responded to the ongoing digital transformation with a rather ineffectual re-instrumentation of the prevailing teaching and studying activity (Fischer & Scharff, 1998). The digital instruments that are mainly promoted largely reflect

a mere digital re-modelling and re-instrumentation of the underlying patterns of control and responsibility, thus leaving the traditional distinction of roles and distribution of power basically untouched (Coates, et al., 2005). The digital instruments that have been introduced on a large scale do not seem to permit the development of emancipated forms of learning activity at large (Amory, 2010). They do not support individual and collective boundary crossing either, thus making it difficult to couple, networked learning activity freely with activity systems outside of the realm of higher education. To express this shortcoming in very concrete terms: it is highly unlikely that an individual (or collective) subject would select and install an LMS platform of the kind that still dominate the higher education system, to support, mediate, and further develop her learning activity (Lerntätigkeit) - especially not outside of any formal education context.

2.6 Potential levers and instruments for change

Any attempt to emancipate and re-instrument learning activity within the contextual constraints of contemporary higher education, requires a (preliminary) understanding of what elements of the overall system could be considered as potential levers for change, and what instruments could be introduced and applied to support the intended change process. The following paragraphs try to provide a condensed overview of the key levers and instruments for change that were considered essential elements of the interventionist work for this thesis project.

2.6.1 Patterns of control and responsibility

It was attested earlier that contemporary attempts to re-instrument teaching and studying practise within higher-education with the help of networked, digital tools and services, predominantly tend to replicate established patterns of control and responsibility over instructional elements and functions. Decades of scholarly work on aspects of self-direction in education have emphasised the analysis and the need for a systematic change of these patterns in formal education in general, and in adult education in particular (Candy, 2004). However, this field of research has always been rather compartmentalised and conceptually messy. In his seminal meta-analysis of research literature on self-direction in education, Candy (1991) distinguished two main strands of inquiry. One was mainly conceptualising self-direction as a (process-oriented) method of instruction, while the other (outcome-oriented) strand was interpreting self-direction rather as a personal disposition to be formed and developed through instruction. Within the process-oriented strand of research on self-direction there is a general split between scholars that either focus on formal educational settings, or self-direction (in learning) in informal settings. Candy (1991) suggested labelling the former theme *learner control*, and

the latter *autodidaxy*, to distinguish them accordingly in scholarly discourse.

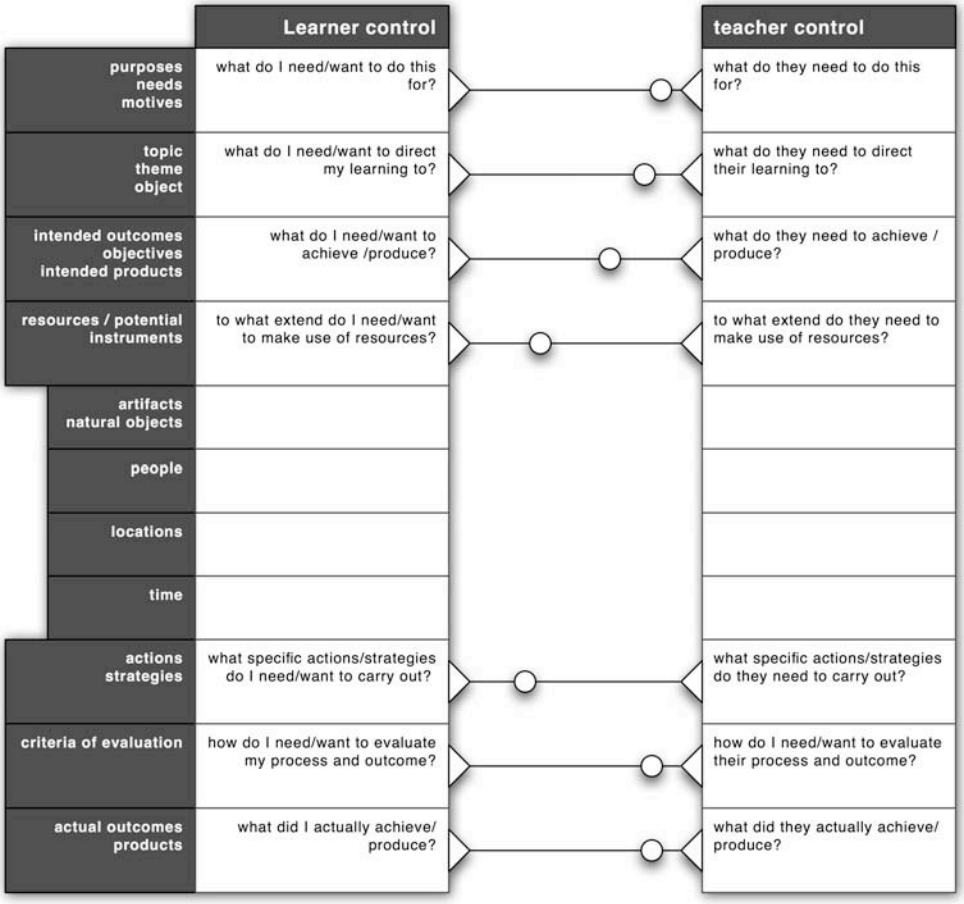
It has to be noted that the research on issues of self-direction in formal education (learner control, in Candy's words), generally tends to focus on shifting control over selected, and often isolated, instructional components to the "learners" while keeping the general structure of a teacher dependent learning (or rather studying) activity in tact. This general focus is widely shared by research that is published under the label of self-regulated learning. This strand of research also tends to investigate self-regulative and meta-cognitive aspects of learning activity within the traditional activity system of "schooling" (Zimmerman, 1990).

Self-direction in education is thus often reduced to the more or less artful and systematic provision of choices within a relatively narrow range of pre-selected and pre-defined instructional components. Many applications of educational technology that claim to foster "self-directed learning" (such as computer assisted-instruction, adaptive hypermedia systems, intelligent tutoring systems, and so forth) on closer inspection seem to allow for very limited levels of self-direction (in the sense of learner control) (see for example Stubbe & Theunissen, 2008) and tend to reduce it to an instructional method within the larger system of schooling. Digital instrumentation options, for example, are generally not conceptualised as an element that should be put under the control and responsibility of "learners," instead they are understood and designed as instruments for teaching activity, allowing for a pre-designed range of choices on selected instructional components.

Altogether it has to be attested that while research on self-direction in formal education has addressed the shift of control and responsibility on key instructional components, it usually has done this within the overall framework of a structurally coupled teaching and learning (studying) activity. It is questionable that this approach allows for a systematic and comprehensive emancipation of individual and collective learning activity (Lerntätigkeit). This would require a subject (of learning activity) that can exercise its agency independently from a structural coupling to a teaching activity of any kind, and not a subject that can successfully choose between a pre-defined range of options in relation to key instructional components.

However, these key instructional components need to be considered as an important set of potential change levers for any interventionist attempt to support the development of (emancipated) learning activity within higher education. In fact, I want to argue that they need to be addressed explicitly and comprehensively if developing learning activity is to be made the object of inquiry and intentional development. The following graphic integrates the key instructional components that are usually stated in the literature (see for example Dron, 2007; Geis, 1976; Hiemstra & Sisco, 1990; Knowles, 1975, 1984) while applying some terminology that seems a bit more commensurable

with the cultural-historical school of thought.



(Graphic 2: patterns of control over instructional components)

While traditional forms of schooling tend to emphasise the agency of the educational authority (teacher) and her control of all key instructional components, "self-directed learning" in formal education promotes the gradual shift of control and responsibility to the individual (or collective) learner. The development of learning activity that can also be sustained outside of formal education and its structural support through teaching requires that the pattern of control (over key instructional components) emphasises the agency of the individual (or collective) subject instead. Thus, any attempt to develop and re-instrument learning activity needs to address such patterns as an essential lever for change.

2.6.2 Personal|inter-personal learning projects

Developing learning activity that is getting increasingly de-coupled from teaching activity requires some intermediate, conceptual and procedural instruments. Since this thesis project was mainly focused on practical intervention work on the program and course level within higher education settings, it required a conceptual instrument and organisational vehicle that could support the necessary transition from teacher organised instruction and

interaction to a concrete expression of independent, subject-driven learning activity (Lerntätigkeit) within the contextual constraints of formal higher education. To enable practical intervention work towards such a transition, a given formal educational setting needs to allow for a project-based format on the course level. If the institutional-, or (curricular) program level support such a (course) format in principle, personal learning projects and/or inter-personal learning projects can be used as the main vehicle for defining, negotiating, and managing an educational episode. They are an important instrument for the explicit shift of control and responsibility over key instructional components. Their successful implementation in formal educational settings, however, generally requires some sort of procedural support.

2.6.3 Personal|inter-personal learning contract procedure

Proponents of the self-organised/conversational learning approach (Harri-Augstein & Cameron-Webb, 1996; Harri-Augstein & Thomas, 1991; L. Thomas & Harri-Augstein, 1985, 2001) have been prolific makers and testers of a variety of reflective-conversational methods and tools for the procedural support of gaining awareness about one's current state of learning activity and its qualitative development. Though these instruments have not been developed within the cultural-historical school of thought, they show a remarkable conceptual compatibility and were thus selected as potentially effective instruments for bringing about the intended change. In the context of the intervention work for this thesis project a Personal Learning Contract procedure (see publication 1 for a detailed description) was used as the main practical instrument to support the formulation, negotiation, monitoring, and evaluation of personal (and inter-personal) learning projects.

2.6.4 Personal|distributed learning environments

The notion of *personal learning environments* emerged as a controversial concept during the run-time of this thesis project and gained considerable popularity and traction within the educational technology community (see for example Attwell, 2007; Johnson & Liber, 2008; Severance, Hardin, & Whyte, 2008; Wilson, et al., 2006). It was re-interpreted (S. Fiedler & Pata, 2007; S. H. D. Fiedler & Väljataga, 2011) and gradually integrated as an additional conceptual instrument to analyse and model the resources (and their digital representation and mediation) that an individual is aware of and has access to in the context of an educational project at a given point in time. This understanding emphasises the individually perceived nature of a personal learning environment (and its potential instruments) in relation to a specific personal learning project. It is thus rather used as a subjective, mental construct and not as a concrete manifestation of particular sets of instruments. To address similar issues in the context of collective learning activity, distributed learning

environments was introduced as a corresponding conceptual instrument (S. Fiedler & Pata, 2007).

2.6.5 (Re-)instrumentation through open, generic, networked tools and services

Inspired by the networked, digital re-instrumentation of individual and collective learning activity that emerged "in the wild," and alarmed by the rather incompatible and limiting digital re-instrumentation of teaching and learning practises that began to dominate higher education, the author of this thesis focused on the application and appropriation of open, rather generic, light-weight, networked tools and services as the premier choice for re-instrumentation of learning activity (Efimova & Fiedler, 2004; Efimova, et al., 2004; S. Fiedler, 2003a, 2007a; S. Fiedler & Sharma, 2005a, 2005b; S. Fiedler & Väljataga, 2008). While the overall landscape of these instruments and accompanying practises (successively, and sometimes alternately, labelled as personal webpublishing, social software, Web 2.0, and social media) is continuously expanding, they seem to share some common characteristics.

Their wide and accelerated distribution and dissemination has been largely driven by open access and open source principles, which made it possible to establish and develop personal (or collective) ownership and authorship in radically new ways. Their predominant reliance on and compliance to open Web standards has made it possible to maintain their loosely-coupled, networked nature while developing an (ever) increasing inter-operability, allowing for creative forms of re-mix and mash-ups. This in turn frequently opens up new, experimental instrumentation options. Apart from the inter-connectivity and general compatibility of these instruments, it seems that it is precisely their rather generic nature that makes it relatively easy to transfer and adapt their use within a wide range of human activity and activity systems. A prominent example for this would be the use of weblog authoring gaining considerable (if not transformational) impact rather different areas of social practise such as journalism (Gillmor, 2004), corporate knowledge-management (Ehms, 2010), and political activism (Smith, Lehmann Schlozman, Verba, & Brady, 2009).

Conceptually, it seems impossible to capture this dynamic, developing landscape of instruments within the digital realm. We seem to have no other choice than to treat this "moving target" as an evolving space of instrumentation options for all kinds of human activity, including learning activity. However, to support the co-evolutionary development of human dispositions and expanding reach of the digital realm we need to stimulate the selection of, and experimentation with, instrumentation options that correspond with the current stage and the proximate zone of development of the leading medium.

During the run-time of this thesis project, the "seed" configuration of digital networked instruments that was regularly used within the practical intervention work was dominated by personal and collective webpublishing tools and services such as weblogs, wikis, webfeeds, webfeed-aggregators, bookmarking services, and so forth. These core instruments were then usually expanded individually and collectively according to the needs and preferences driving the personal and inter-personal learning projects. In fact, the self-directed digital expansion and augmentation of personal and distributed learning environments was conceived as an important expression of the development and re-instrumentation of learning activity as an object of inquiry and change.

2.7 Developmental moves and changes to be supported

It was suggested earlier that educational R&D practise in higher education needs to construct the development of learning activity (Lerntätigkeit) as and explicit object of inquiry and change and to explore how change could actually be supported and brought about effectively. The potential change levers and instruments outlined above thus need to be placed within a systematic framework that organises and directs possible interventionist R&D efforts. The following table displays such an attempt.

	coupled teaching and learning activity as the prototypical form of organised learning in book culture		transformative learning activity (first order)	emancipated individual learning activity	transformative learning activity (second order)
subject	teacher / instructor	student	adult learner (facilitator / coach)	adult learner	adult learner (facilitator / coach)
instruments	mediated teaching methods/ strategies	mediated studying methods/ strategies	mediated reflective/ conversational methods; shift of control over structural components of learning activity	personal learning projects; mediated personal learning environments	mediated reflective/ conversational methods;
object	area of human culture to be acquired/mastered	area of human culture to be acquired/mastered as defined by the subject of teaching activity	unemancipated individual learning activity (and its structural components)	area of interest or challenge / zone of development	emancipated individual learning activity
outcome	developing acquisition/mastery of area of human culture by student	developing acquisition/mastery of area of human culture as defined by the subject of teaching activity	developing emancipated individual learning activity	developing mastery of area of interest or challenge / zone of development	developing new forms of emancipated individual learning activity

(Table 1: potential transformations of individual learning activity)

The framework (of potential transformations) starts from the assumption that, in general, adult actors within higher education have developed the ability

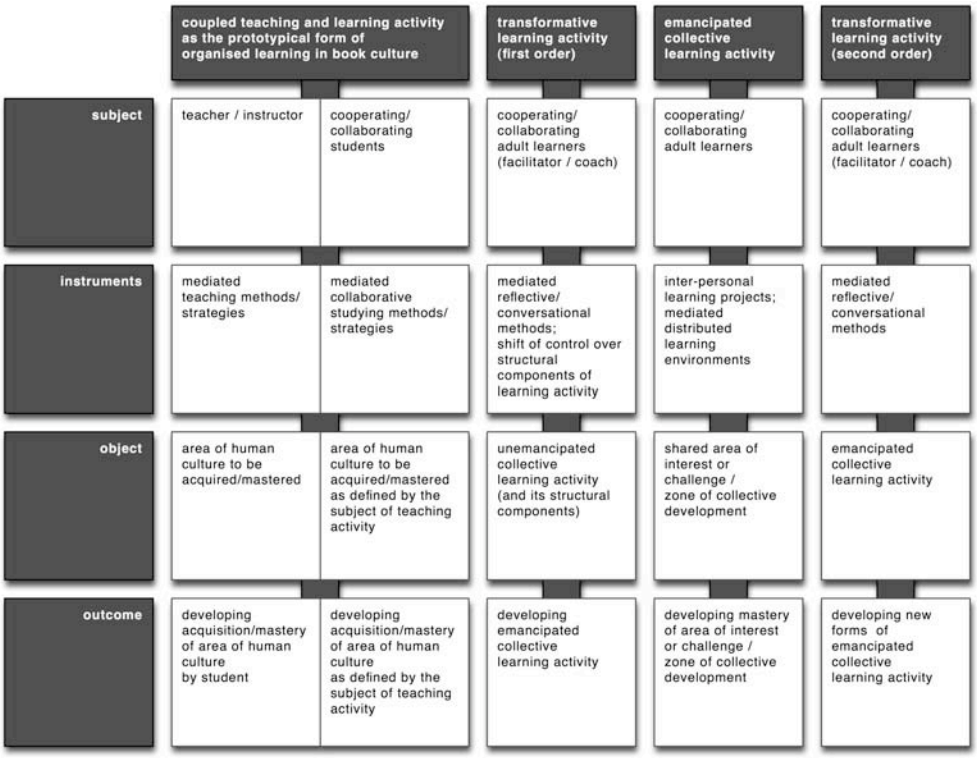
to engage in individual and collective learning activity (Lerntätigkeit) through their extensive personal history within the activity system of schooling and its particular forms of mediated (vermittelter) inter-action.

However, it also assumes that within formal education teaching and learning activity regularly remain of a dual, somewhat parallel nature, thus resulting in a form of *unemancipated* learning activity that is closely coupled to, and dependent on, its teaching counterpart. This structural coupling is usually expressed through typical patterns of responsibility and control over "instructional elements" such as time allocation, tasks, goals, resources, and instruments (increasingly including digital artefacts of various kinds).

The further development of learning activity seems to require a new type of collective activity that actually takes the present unemancipated form of learning activity as its object (of change). The minimal collective subject of such a shared activity would be an adult learner together with a facilitator/coach. Promising instruments for this type of work are the reflective-conversational methods (re-mediated by networked tools and services) to model the structural components of learning activity and to support a comprehensive shift of control (over instructional components) via concrete learning projects.

The (intermediate) outcome of such (first order) transformative learning activity should be a developmental move towards a more emancipated and re-instrumented form of learning activity. Emancipated learning activity could then be characterised as the systemic independence of learning activity from teaching that allows adult learners to (self-)define their areas of interest or zones of (necessary) development. Emancipated learning activity would be mainly expressed via the formulation and execution of personal learning projects within mediated personal learning environments within the new leading medium.

Though this type of intended transformation of learning activity already appears as a formidable task within mainstream higher education, it is theoretically possible to establish another, second order, transformative learning activity that in turn takes the emancipated (and re-instrumented) learning activity as its object (of inquiry and change). This would again involve the use of reflective-conversational methods, and aim for the development of new forms of emancipated learning activity. Conceptually it seems to be entirely possible and commensurable to explicitly apply the very same logic to the notion of collective learning activity, too. This is depicted in the following table.



(Table 2: potential transformations of collective learning activity)

The main difference to the above contemplation of possible developmental transformations of individual learning activity is the fact that the subject of learning activity is here always conceived as a collective subject of co-operating and collaborating adult learners. This collective subject then gets supported and extended by a facilitator/coach within transformative learning activity. In principle, the same instruments that are applied within transformative learning activity focusing on the development and re-instrumentation of individual learning activity can also be used here. However, emancipated collective learning activity would be characterised by the collective subject engaging in inter-personal learning projects within mediated, distributed learning environments. Naturally, the requirements for co-operation and communication are more demanding and qualitatively different from what is necessary within individual learning activity.

Theoretically there is again the option to establish and engage in a second order type of transformative learning activity that intends to work on already emancipated collective learning activity with the aim to develop entirely new forms of it collectively. It seems rather unlikely, however, that this second order type of transformative development of learning activity is a feasible intervention target within contemporary, formal higher education. While its achievement is certainly not impossible, it would require the contextual constraints within a given system (of higher education) permitting a collective subject of cooperating and/or collaborating actors that shows some sort of stability over longer periods of time.

Engaging in first order transformative learning activity, however, seems to be entirely within the reach of interventionist educational R&D practise. Such practise would take the development and re-instrumentation of learning activity as its explicit object of inquiry and (intentional) change in higher education.

2.8 Problem statement and critical, normative positioning

Based on the above deliberations it becomes possible to summarise the educational and societal problem this thesis project tries to address. Since the ongoing digital transformation reached a new dynamic, developmental stage around the turn of the century, the disparity between the openly accessible re-instrumentation options for emancipating and developing learning activity "in the wild", and the dominating institutional approach to digital re-instrumentation of teaching and learning activity, has steadily increased. The latter approach has primarily led to the assimilation of emerging digital instrumentation options within the "walled gardens" of higher education institutions, while maintaining the patterns of control and responsibility that are underlying the established teaching and studying practises. Thus, higher education, regardless of its introduction of digital instruments, largely re-produces and reinforces unemancipated and teacher dependent forms of learning activity. This state of affairs represents severe limitation for the individual and collective development of emancipated and properly mediated learning activity, and the further development of new forms of such emancipated learning activity. Higher education progressively runs the risk to foster the re-creation of increasingly isolated forms of (unemancipated) learning activity that cannot connect to other types of human activity within the digitally transformed life-stream. Active intervention to support transitional and transformative change in this regard seems to be paramount. In fact, in the light of the ongoing societal changes, it seems more than appropriate to shift the focus of educational R&D away from incremental performance improvements within the activity system of *schooling*, in favour of a systematic emancipation and development of individual and collective learning activity in its own right.

That the necessary transitional and transformative changes tend to evoke initial performance drops, a range of unwanted, negative side-effects, and resistive reactions has to be expected. They should be conceptualised and addressed as the typical results of any effective intervention into an established, complex system of human activity. How to approach such a challenge and change intention methodologically shall be the topic of the following reflection.

3 Methodological reflection

3.1 The original research approach and its shortcomings

Taking human activity and its instrumentation as an object of inquiry (and change) is always a rather challenging undertaking. To do this in the context of an ongoing, accelerating, expansive societal transformation raises even more methodological issues. Over the last ten years, the field of networked social media and software, for example, showed such a dynamic development and continuous experimentation with new instrumentation options and emerging practises, that any attempt to build universal, theoretical knowledge in the sector tended to be rather short-lived and quickly out-dated. While its phenomenology is continuously changing, its variability and differentiation is increasing. The same holds partially true for human activities that increasingly integrate these emerging instrumentation options, thus shaping in return the co-evolutionary development of human dispositions of various kinds.

To deal with these "moving targets" a research approach seems necessary that combines analysis, design, intervention and implementation, review and evaluation to construct knowledge that has the potential to become relevant for practise. Thus, this dissertation project initially followed elements of design-based research (see for example Bereiter, 2002; A. L. Brown, 1992; Collins, 1990; Collins, Joseph, & Bielaczyc, 2004; Edelson, 2002; Wang & Hannafin, 2005) approach that attempts the iterative execution of cycles of design, implementation, reflective analysis, and re-design to develop theoretical insights through practise and to improve practise through theoretical guidance. The small-scale, intervention and implementation studies that were carried out between 2003 and 2005 followed this methodological approach. Theoretically they mostly drew on concepts developed within the conversational/self-organised learning approach (S. Fiedler, 2003a; S. Fiedler, et al., 2004; S. Fiedler & Sharma, 2005a, 2005b; Sharma & Fiedler, 2003, 2004a, 2004b, 2007) and focused predominantly on developing individual learning activity through the (re-)design of (conversational) learning environments making extensive use of the emerging landscape of loosely-coupled, networked tools and services.

The continuation of this work within the contextual constraints of iCamp, an international, distributed, and externally funded R&D project, made it necessary to expand the object of inquiry from individual learning activity (and its re-instrumentation) to more collective forms of learning activity. The contextual constraints that had been set for iCamp also represented an implementation (and intervention) context of considerably more dynamic and complex nature. New forms of (re-instrumented) collective learning activity were supposed to be established and evaluated within international, inter-institutional, and inter-disciplinary settings. iCamp also followed an explicit design-based research approach, designing, planning and executing a series of three implementation studies in such settings. The project followed the

rationale that the iterative implementation of such designs within a class of similar settings could eventually lead to the validation of a set of effective conceptual and digital instruments, and their theoretical understanding. To cross-validate our "designs" we also opened a line of small-scale studies at Tallinn University that focused on their application and implementation in a more local setting.

The intervention studies allowed for the participation of different groups of actors such as facilitators, students, institutional representatives and researchers/interventionists in the various stages of the design, development and implementation process. Observational data was collected directly in form of digital traces of the use and application of technological tools and services that were part of the intervention and design measures, and through the selective use of interview techniques. Qualitative data evaluation and interpretation methods were used to create rich descriptions of specific implementation cases and provided material for a comparative analysis of selected aspects, and the further development of our learning environment designs. The insights derived from the series of implementation studies informed the gradual creation and iterative refinement of a specific *learning environment design model* (S. Fiedler & Pata, 2007), which was expected to help us achieve increasingly more robust interventions and implementations throughout the project's duration.

In the course of the project, however, it became increasingly apparent that the general notion of "producing" new types of individual and collective learning activity through the mere design, implementation, and evaluation of new types of learning environments, didn't adequately address the systemic complexity of the settings we were trying to work with. Together with a small team of researchers that was working on the conceptual and theoretical direction of the educational aspects of iCamp, the author of this dissertation project tried to formulate a decidedly more interventionist approach, partly inspired by the methodological heuristics, and interest in developmental transformations that had been formulated and applied in the work of the Center for Activity Theory and Developmental Work Research at the University of Helsinki (see for example Engeström, 2001; Engeström & Sannino, 2010; Toiviainen & Engeström, 2009; Virkkunen & Kuutti, 2000). Scholarly work on systemic intervention (see for example Argyris, 1970; Flyvbjerg, 2001b; Foster-Fishman, Nowell, & Yang, 2007; Hawe, Shiell, & Riley, 2007; Midgely & Ochoa-Arias, 2001; Midgley, 2000; Seidman, 1988; Ulrich, 1987; Willke, 2005) and the system design approach in education (see for example Banathy, 1988, 1991, 1992, 1994; Jenks, 1994; Jenlink, 2004; Reigeluth, 1994, 1995; Reigeluth & Garfinkle, 1994) was also gradually integrated into our deliberations. We proposed to understand the implementation studies carried out in the context of the iCamp project as

"systemic interventions" into existing (social) practises. These interventions were driven by an explicit intent to disrupt the former practises and to support their transitional change, thus making it possible to establish new forms of individual and collective learning activity and their realisation within distributed activity systems mediated by loosely-coupled, networked social media tools and services and the reorganisation of distribution patterns of control and responsibilities in formal higher education.

The proposed conceptual and methodological re-orientation proved highly controversial within the iCamp research consortium. The specific socialisation and training backgrounds of participating researchers who came from a variety of disciplines (computer-science, psychology, education, information science, and so forth), seemed to make it impossible to consider the intentional change of (educational) practise through direct intervention as an adequate R&D focus and strategy. Intervention into practise was rather seen as a side-effect of a research methodology that tried to shape and validate the theoretical and technical instruments through a series of implementation projects in the field, the core goal of such a strategy being the gradual abstraction and generalisation of these instruments and the theoretical modelling of their functioning to "improve" the performance of the overall system (of teaching and studying activity). Though the overall complexity and unpredictability of intervening into social practise was generally acknowledged within the context of our collaborative fieldwork, the search for highly abstracted, general, predictive form of knowledge was treated as an indisputable goal for applied social science. This largely prevented a methodological re-orientation that could have been shared by the whole research consortium.

For the author of this dissertation project, however, this experience triggered the interest in an in-depth review and analysis of a variety of educational R&D approaches that had been influential in different phases of the overall project, and the re-construction on how these approaches seemingly deal conceptually and methodologically with the notion of intentional change. The methodological framework that the design based research approach had provided for much of the overall project didn't seem to adequately address the issues that had been raised in the context of iCamp and beyond.

3.2 Educational science as applied social science?

From a cultural-historical perspective it is not surprising that since the industrial revolution the various branches of engineering have become the model case for applied sciences. This might be partly due to the fact that engineering in principle followed the call for methodological monaism in science and that it developed its original forms of craftsmanship and tinkering rather quickly into formats of inquiry largely commensurable with the general

principles and methods of the (basic) natural and formal sciences. This combination of scientific-technological production of knowledge, procedures and artefacts developed into a self-feeding expansion of human instrumental powers that allowed, and still allows, the apprehension of the natural life world to an unprecedented scope and scale and the emergence of what Mittelstraß (1992) calls the, man made, Leonardo World.

The extraordinarily success of the combined natural and formal sciences and the visible production power of its commensurable applied engineering branches led to an increasingly enthusiastic uptake of its general principles and methodological rationale in areas of inquiry dedicated to human affairs and phenomena. The emergence and institutionalisation of social and behavioural sciences like psychology and sociology is intimately tied to the deliberate attempt to model its practise after the "natural/formal science-plus-engineering" example and to design (or adapt) its objects of inquiry accordingly. What remained within the humanities (Geisteswissenschaften) initially continued to follow its hermeneutic-interpretive tradition but was (and still is) exposed to repeated attempts to subsume its objects of inquiry and methodological rationale under the general principles of "science". Especially the areas of inquiry dedicated to human affairs and phenomena that have advocated the natural science-engineering model have remained battlegrounds of philosophy of science and their attached methodology wars. There is reason to believe that this has partly historic reasons, since hermeneutic-interpretive traditions were never overthrown entirely and have always co-existed with the natural science-engineering model.

What seems to be more important, however, is the fact that the application, or some may say the imitation, of the natural science-engineering model so far has not resulted in the same impressive instrumental power in human affairs that society experienced in relation to the natural and material world. This, of course, is a gross simplification. Everywhere where we deal predominantly with the material-biological aspects of living human systems and where we can "objectify" these aspects the natural science-engineering model has produced notable results (for example, in certain areas of medicine). Although, even there, it never quite reached the predictive power generally attributed to the natural science-engineering model.

The relative weakness and confinement of the results of the science-engineering model in areas of inquiry dealing with human affairs and phenomena, have spurred, time and again, critique, discussion, and the development of rather incommensurable positions. Some proponents believe that the natural science-engineering model in principle is also an adequate approach to all human and social matters. They see the relative weakness and confinement of its results as an expression of the relative short lifetime of these programs of inquiry. From their perspective applied social sciences, like

engineering, are meant to deal with issues of integration and application of the universal, context-independent knowledge that various (basic) social sciences and other applied sciences (for example computer science) provide. Using (again) universal scientific method applied sciences then refine and produce instrumental-rational knowledge for a particular field (or fields) of practise (or application). What I see problematic here is that this thinking carries the (hidden) assumption that either the objects of inquiry in social and human sciences can (and indeed should) adequately be treated according to the natural science-engineering model, or that the objects of inquiry have to be designed accordingly. This thinking holds serious consequences, from my perspective. Firstly, it moves many (potentially important) objects of inquiry in human affairs outside of "scientific" treatment. Secondly, it establishes a primacy of method that often results in a situation where "…method, so to speak, creates the phenomenon (research object) of investigation" (Hakkarainen, 2009, p. 225). And, thirdly, it tends to subsume all empirical-analytical efforts under the rationale of the natural science-engineering model with its focus on nomologic, universal, context-independent knowledge.

Modelling applied social sciences exclusively in this way has been rightfully attacked and rejected on various grounds (methodologically, historically, philosophically) and with various interests in mind. While this is certainly not the place to develop an in-depth inquiry into the philosophy, sociology, and psychology of science, it is important to note that the plurality and partial incommensurability of perspectives that characterises the current state of affairs in the social and human sciences requires a careful personal positioning before any methodological issues can be reasonably discussed.

I hold the perspective that one promising alternative conception lies in the notion of (applied science as) action science (Handlungswissenschaft) or practical science (Praktische Wissenschaft). This view takes as its starting point the particularities and peculiarities of its object of inquiry - human practise. An action science inquires what needs to be done and how. It produces insights and knowledge about what happens (or is likely to happen) if one acts in a particular way in a particular situation, or what one should do in a particular situation to reach a certain goal or end. Empirical-analytical methods play an important role in such an endeavour but they are not (and cannot be) subsumed under the particular rationale of the natural science-engineering model. Instead, the instrumental knowledge that can be expected from action science is of a heuristic kind. Such knowledge has to be combined with a purposeful deliberation and reflection of value-rational issues and their methodological treatment. Thus, in combination it should provide orientation knowledge for specific human practises.

Like other areas of inquiry in human affairs, education can also look back at a long tradition of mainly hermeneutic-interpretive methodology. With the

advent of social and behavioural sciences (modelled after the natural science-engineering model) it gradually grew into the role of an applied science, integrating basic knowledge from these sciences to produce and apply instrumental-rational knowledge in its field of interest. This has inevitably led to an import and gradual strengthening of the natural science-engineering model and its rationale in education. Willis (2008) has summarised this view in the following words: "Applied social science research (and I include education and educational technology in this category) strives to show how models or theories of professional practise derived from the implication of laws embedded in theories can be shown to work" (p. 122). This general development has been recently accompanied by the integration of artefacts and procedures that are growing out of the engineering branches that are developing the digital information and communication-technologies, thus creating an even stronger influence of the natural science-engineering model in education.

While educational science, like other social sciences, has maintained a plurality of positions and perspectives, the quest for nomologic, context independent, knowledge, following the natural science-engineering model, has become to dominate educational research and development. As I have already outlined above, this development has serious consequences and tends to obscure or simply ignore that the primary object of inquiry in educational research and development is a human practise (and not a natural phenomena or the simple result of a human production process of some sort).

3.3 The peculiarities of educational practise

While one could argue that all applied sciences and the human practises that they are trying to serve are fundamentally driven by the idea of bringing about intentional change in the human life world, the applied social sciences that try to serve human service practises (such as educational practises, therapy, medical practises, social work, and so forth) show some particularities and peculiarities that are often ignored and under-reflected in relation to their potential methodological implications and consequences. As I have indicated above, I hold the view that the primary object (Gegenstand) of educational research (and development) is (or should be) educational practise. Educational practise refers to any human activity (or human activity system) that has as its primary object to (systematically) bring about intentional qualitative change on various levels either within the subject itself (self-educational practise) or within other individual (living) human systems and/or collective human systems. It thus follows a *principle of intended change*.

Is the educational practise directed to the bringing about of intentional, qualitative changes within other individuals or collective (living) human systems, another principle (often) comes into play. Educational practise often

tries to bring about (positive) qualitative changes in individual (living) human systems and/or collective human systems so that these systems can become the subject (and agent) of bringing about intentional, qualitative changes within themselves. This aspect can be labelled as the *principle of progressive emancipation towards self-change*. One could say that educational practise thus fundamentally aims on helping human systems to become the subject of their own intentional, qualitative change over time. "Intentional" seems to be an important keyword here. Human activity that focuses on bringing about intentional qualitative change in individual or collective human systems is not identical with the notion of "learning" in a broader sense. Indisputably, human systems can and do "learn" (qualitatively change) while, for example, being engaged in a wide range of activities or by being confronted with occurrences (Widerfahrnisse) of various kinds.

We speak of "learning" whenever we observe a change between two conditions of a (living) system, and when we attribute the observed change to a conscious selection of possible changes by the system (Jünger, 2004). Thus, learning "explains" why a particular change occurred. We make an inference from evidence that there has been some significant change in somebody else's, or our own, way of thinking, perceiving, and doing something (Harri-Augstein & Thomas, 1991). We never directly observe "learning" but "something as learning." From an observer's (and self-observer's) point of view we attribute evidence of qualitative changes on various system levels to the explanatory principle of "learning". It should be obvious that the use of such an explanatory principle is not confined to qualitative changes that occur in the context of educational practise. It is also important to note that educational practise is not necessarily coupled with (or subsumed under) institutionalised human activity systems such as school or university. In principle, educational practise can be coupled with a wide range of human activity systems or stand on its own (as in various types of self-educational practises). The attempt of describing educational practise in rather generic terms does leave open what qualitative changes, on what level, of what human system, are actually intended. Moreover, it leaves open what we mean by "bringing about" such changes and how we think we can accomplish it.

Since educational practise, like other human practises, is embedded in and reflects wider socio-historical developments in human society and its activity, it is obvious that over time and within certain cultural constraints educational practise has taken many forms and made use of a wide range of concepts and assumptions. In sum, one could say educational practise, and its rationality, is contextually bound in a fundamental way. I want to argue that any attempt to make the rather generic description of educational practise from above more specific cannot transcend this socio-historical (contextual) dependency. Neither can the practise of educational research (& development). If that

argument holds true then one should indeed expect that this raises serious methodological issues and/or requirements for the practise of educational research (& development) and its (more or less) intimate relationship to educational practise. Thus, I believe that methodological discussions regarding specific observational, data processing-, and interpretation instruments in educational research (& development) have to be framed by a careful conceptual analysis of its (intended) relation to educational practise in general and the specificity of the type of educational practise (in respect to its context, intentionality, and so forth) it intends to serve. I also maintain the view that educational practise essentially operates within a "teleological background" (Wright, 1971). It implicitly or explicitly follows the fundamental pattern of reasoning:

Someone sets himself to do [something]
in order to bring about [object of intention].

Anscombe (1976) identified this practical syllogism as a form of reasoning in its own kind. Von Wright (1971) reconstructs its main idea with the following words:

> The starting point or major premise of the syllogism mentions some wanted thing or end of action; the minor premise relates some action to this thing, roughly as a means to the end; the conclusion, finally, consists in use of this means to secure that end. Thus, as in a theoretical inference the affirmation of the premises leads of necessity to the affirmation of the conclusion, in a practical inference assent to the premises entails action in accordance with them (p. 27).

Some authors (for example Sehon, 2005; Wright, 1971) propose that this form of practical reasoning does provide the social science with "an explanation model in its own right which is a definitive alternative to the subsumption-theoretic covering law model. Broadly speaking, what the subsumption-theoretic model is to causal explanation and explanation in the natural sciences, the practical syllogism is to teleological explanation and explanation in history and the social sciences." (Wright, 1971, p. 27).

While a discussion of the wider implications of such a proposal is well beyond the scope and interest of this text, it is important to emphasise that "teleological explanations cite a future state of affairs toward which the behavior was directed, rather than an antecedent state that caused the behavior." (Sehon, 2005, p. 13). They point to the future in the sense of "this happened, in order that that should occur" (von Wright, p. 83). Even if one doesn't want to engage in issues around the "scientific" status and value of teleological explanations as such, the mere resemblance of our generic description of educational practise and the practical syllogism as a form of (teleologic) practical reasoning merits a closer analysis and reflection.

In fact, I want to argue that this pattern of reasoning is of particular interest and of methodological consequence if educational research (& development) transcends the traditional boundaries between applied science

(as practise of research) and practise (as a field of application of the products of research). As soon as educational research practise becomes action (and intervention) oriented (handlungsorientiert) and adopts or defines explicit objects of (intended) change, it begins to import teleologic principles and patterns of reasoning that are most common in (educational) practise. This raises (or rather emphasises) value-rational questions and corresponding methodological issues that are purposefully ignored within a traditional conception of educational research as applied social science based on an ideal of instrumental-rationality and methodic detachment from practise.

3.4 A re-turn to practise and the notion of action science in educational R&D

Miettinen et al. (2009) have recently attested a re-turn to the concept of practise in the social sciences and philosophy that, in principle, allows for bridging different levels of analysis. In the authors' view "the concept of practise calls for developing vocabularies and approaches that allow the transcendence of the division between such levels, such that we are able to understand practise as taking place simultaneously both locally and globally, being both unique and culturally shared, 'here and now' as well as historically constituted and path-dependent" (p. 1310).

It is important to note here that this attested re-turn to the concept of practise in social science is not identical with the notion of action science (Handlungswissenschaft) that I have roughly sketched out above. Social practise inquiries primarily follow theoretical ambitions. Either they are trying to address philosophical or theoretical problems in social sciences. If they engage in empirical research, they seem to be mostly concerned with ethnographic and descriptive studies of practise (in the life world) embedded in a hermeneutic-interpretive rationale, thus focusing on concept (or vocabulary) construction, thick description, and "understanding". It comes as no surprise that "the different research programmes for studying practises empirically are animated by different theoretical and philosophical presuppositions" (Miettinen, et al., 2009, p. 1314). These hermeneutic-interpretive approaches to the description of, and theorising about, social practise, are certainly of interest from the perspective of developing descriptive vocabularies and frameworks for the study of educational practise. However, educational research (and development) as action science (Handlungswissenschaft) in the sense that I have briefly outlined before, does not remain in a mere observer's perspective, only studying educational practise with the aim of describing, understanding/explaining, and thus theorising about it. Instead, it delineates its object of inquiry (a particular educational practise in context), engages with it, and intervenes into it, with an explicit concept of (positive) change denoted.

Its knowledge-constituting interest could be tentatively described as a

combination of heuristic-instrumental (guidelines for contextualised action and intervention), practical-phronetic (deliberation of value-rational aspects of means and ends), and developmental-emancipatory (deliberation of issues of power, self-determination, and growth) aspects. Its goal is the production of orientation knowledge (Orientierungswissen) for educational practise.

In order to develop my line of reflection and argumentation further, I have decided to review and analyse an exemplary selection of contemporary approaches in educational research (& development) that have "turned to practise" for a variety of theoretical and methodological reasons and that have influenced and informed my own conceptual and empirical work over the last 10 years. My analytical interest here is threefold:

Firstly, I want to compare how different approaches tend to delineate and conceptualise their particular "systems of inquiry" in relationship to educational practise (as their general object of inquiry).

Secondly, I want to trace elements of "systems of change" that are either implicitly or explicitly formulated. In other words, I want to look for concepts of intervention, intended (positive) change, and thus teleologic elements within these different research approaches.

Thirdly, I want to evaluate if and how these approaches try to reflect their interventionist orientation (and their corresponding knowledge-constitutive interests) methodically.

Throughout my analysis I will maintain the general (projective) perspective of educational R&D as action science (Handlungswissenschaft) as a point of orientation.

3.5 Comparison of contemporary R&D approaches that "turned to practise"

3.5.1 Outline of analytical framework

The framework consists of the following elements:

- Type of inquiry
  - Educational R&D approach
    - System of inquiry
      - Unit of analysis
      - Subject of research
      - Methodological orientation & instruments
      - Object of inquiry
      - Knowledge-constitutive interest
    - System of change
      - Type of intended change
      - Subject of change

Change levers & instruments
Object of change
Direction of intended change

Type of inquiry

"Type of inquiry" was used to group the education research & development approaches that were found to display an implicit or explicit "turn to practise" orientation. I have distinguished the following types of inquiry:

Design inquiry

Design inquiry approaches focus on development and research activity in (authentic) practise settings. They generally follow methodological principles and guidelines originally created and refined within other design practises (for example, in product design, human-computer interface design, and so forth), such as rapid prototyping, engaging "users" and other stake-holders in participatory or co-design, and cyclical or iterative moves between design, prototyping, implementation, review, (re-)design. This is a rather heterogeneous group of approaches and goes by various labels, such as design studies, design experiments, design research, design-based research, development research, developmental research, formative research, formative inquiry, and so forth (see also van den Akker, 1999). Van den Akker (1999) suggests that "on a rather abstract level, one can distill a very general aim of all approaches: reducing uncertainty of decision making in designing and developing (educational) interventions" (p. 5). However, it should be noted that "intervention" is used in a very (or rather overly) broad sense here. In some cases this would include also materials, products, artefacts, and so forth, that might be better described as "instruments" (within instructional settings). To reduce "uncertainty of decision making" these approaches try to develop and test design principles and procedures for the optimisation of such instruments, or interventions. Thus they often combine an interest in practical ends within a specific context, with a quest for generalisable knowledge and "theory."

Systemic design inquiry

Systemic design inquiry approaches focus on the modelling of wider systems of activity and their systematic change "by design" guided by a vision of an "ideal" of a future (and better) system. They somewhat apply general design principles and procedures that are similar to what is applied by the approaches within the category of "design inquiry", such as systematic stake-holder and "user" involvement, and so forth. However, they make ample use of concepts from systems thinking and attempt to capture regularities of wider systems of activity and their respective sub-systems. Some approaches within this category have responded to ideas formulated under the label of critical systems

approach (or heuristics) (see for example Jenlink, 2004) and try to address value-rational issues within their methodic instruments.

Systemic (developmental) intervention inquiry

This category comprises approaches that focus on the modelling of human activity and activity systems and their qualitative change. Instead of changing whole (wider) systems of activity "by design" these approaches focus on targeted interventions that help to surface and aggravate (historically accumulated) contradictions and tensions within a given activity system of concern. They support and facilitate the development of new instruments, re-configurations of regulations and roles, and re-formulations of the object(s) of activity within activity systems. They are thus mostly interested in (developmental) change coming from within the activity system itself. They focus on change that is somewhat open, emergent, and unpredictable.

Reflective practise inquiry

These approaches focus on the systematic exploration and development of the personal, experiential basis of human practise. They often combine an interest in the personal systems of meaning, and personal models of activity that individuals hold. They tend to work with various types of reflection and modelling on the basis of elicited items of experience and records (or units) of action. They strive for an elicitation, externalisation or "objectification", reflection, and qualitative change of personal models (and theories) of action and personal systems of meaning. They are somewhat driven by ideas of personal emancipation and empowerment.

Educational R&D approach

"Educational R&D approach" names a particular approach that is considered to be a proto-typical example of a particular "type of inquiry". The following approaches have been selected for comparative review:

- The design-based research approach
- The system design approach
- The expansive developmental research approach
- The self-organised/conversational learning approach

System of inquiry

The "system of inquiry" section outlines the essential boundaries and elements of each particular research & development approach.

Unit of analysis

"Unit of analysis" refers to the major entity that a particular educational R&D approach is focusing its analytical and observational efforts on.

Subject of inquiry

"Subject of inquiry" refers to the agent(s) that are considered to be responsible for designing and executing the inquiry activity.

Methods & instruments

"Methods & instruments" summarises the main methodic principles, guidelines and instruments that a particular research & development approach promotes.

Object(s) of inquiry

"Object of inquiry" (Forschungsgegenstand) tries to delineate the principle, specific object(s) of the inquiry activity within each particular approach.

Knowledge-constitutive interest

"Knowledge-constitutive interest" tries to infer what cognitive interests seem to drive and direct a particular approach. Somewhat inspired by Habermas (1972) I have distinguished three main knowledge-constitutive interests in my framework:

- instrumental (effective control and manipulation of environment, law-like knowledge, technical rules) -associated with issues of work and production
- practical (understanding of intentions, value-rationality, norms, judgement, prudence) - associated with issues of appropriate (inter)action
- emancipatory (liberation, growth, development) - associated with issues of power

System of change

The "system of change" section outlines (as much as possible) the essential boundaries and elements of an implicit or explicit concept and vision of change within each particular approach.

Type of intended change

"Type of intended change" tries to delineate roughly what scope and scale of change is intended. I have distinguished the following types of intended change:

- morphostatic change: keeping things running by working out deficiency within the system of concern
- incremental change: improving the performance of a system of concern by "tuning" particular components or sub-systems (often with the hope that it leads to transitional/transformational change over longer periods of time)
- transitional change: inducing dissonance and dis-equilibrium into a system of concern to trigger new organisational states (in a zone of development) within the system and to increase the likelihood for transformational change. New organisational states are generally subject to reversal and need to be stabilised over time
- transformational change: fundamental, discontinuous, and mostly irreversible change within a system of concern

Subject of change

"Subject of change" refers to the agent(s) that are considered to be responsible for "bringing about" (trigger, facilitate, cause, and so forth) the intended

change.

Change levers & instruments

"Change levers & instruments" summarises the main ideas of what "levers" and instruments can be used to bring about the intended change within a system of concern.

Object of change

"Object of change" (Gegenstand der Veränderung) tries to delineate the main object(s) of the change intent and vision within a particular approach.

Direction of change

"Direction of change" tries to identify if the change intent and vision is to bring about either "planned", or "emergent" (open) change (and change trajectories). Also combinations of planned and emergent change (and its trajectory) might be intended within a particular approach.

3.5.2 Design inquiry

3.5.2.1 The design-based research approach

In the category of design inquiry it is hard, if not impossible, to identify one particular approach that can be treated as the unquestionable proto-typical example. As I have indicated above, this is a rather heterogeneous group of approaches that has failed to produce a common terminology. However, in recent years various scholars have made a number of attempts to review, compare, summarise and condense common characteristics (see for example Collins, et al., 2004; Edelson, 2002; Wang & Hannafin, 2005). It also appears that design-based research, or simply design research, have become the most popular terms to denominate that alleged commonality. Noteworthy in this regard is the work of the design-based research collective (www.designbasedresearch.org/) and the publication of some dedicated special issues (see for example Educational Researcher 2003 Vol 32 Issue 1, Educational Psychologist 2004 Vol 39 Issue 4, and the Journal of the Learning Sciences 2004 Vol 13 Issue 1). I will thus use "design-based research" as the exemplary educational R&D approach here, regardless of the variability of its use and interpretation. Where it is necessary I will try to point out that these differences and potential incoherence exists.

Wang & Hannafin (2005) compared a variety of "design-based research variants and methods" and distilled five common characteristics. Their proposal shall serve as a starting point for describing the general orientation of the design-based research approach. Wang & Hannafin (2005) characterise design-based research as pragmatic; grounded; interactive, iterative, and flexible; integrative; and contextual.

It is *pragmatic* in its intent to work on practical issues in authentic settings. Though various authors (see for example Barab & Squire, 2004; Bell, 2004;

diSessa & Cobb, 2004) emphasise its central interest in theory development, it is acknowledged that this is intertwined with practise and that "theory" needs to directly inform and improve practise. This is an issue that I shall critically discuss in more detail within my synopsis of design-based research later in the text.

It is *grounded* in and driven by "relevant research", theory, and practise" (Wang & Hannafin, 2005, p. 8). It should be noted that this often means research, theory, and practise in domains of instruction. In addition it is grounded in real-world settings where "participants interact socially with one another" (Wang & Hannafin, 2005, p. 8).

It is *interactive* in the sense of an intended and purposeful collaboration among participants and researchers that often leads to blurred distinctions. It is *iterative* in its cyclic movement from analysis to design, implementation, analysis, and (re-design). It is flexible in adapting an initial design plan to empirical data and insights gained throughout implementation phases. "The theoretical framework upon which the design is based may be extended and developed; in some cases, a new framework may emerge" (Wang & Hannafin, 2005, p. 10).

Design-based research is *integrative* by selecting and promoting a wide variety of research methods that might differ according to the various stages of the design and research effort. Retrospective analysis is often conducted on the basis of integrating a wide range of collected data, while formative evaluation typically focuses on particular cycles of local design implementations.

Design-based research is *contextual* and thus exposed to a variety of (contextual) constraints that are not controlled by the researchers. Its findings can take the form of comparative profiles, case studies, and heuristic design principles that are contextually relevant. Based on this rough characterisation of the commonality of design-based research I will now try to describe its (typical) system of inquiry and system of change within the analytical framework I have described above.

3.5.2.2 System of inquiry

In abstract terms the system of inquiry that design-based research promotes focuses on (bringing about positive effects on) aggregated (sub-)systems in practise settings. The most common concrete expression of such a system of inquiry seems to be a study that focuses on the effect of particular design interventions on groups of participants in formal educational settings.

Unit of analysis

The main unit of analysis are aggregated and/or individual (sub-)systems and their entities. In concrete terms this means that studies tend to focus on the analysis of the effects of a particular design intervention on groups and/or individual participants in formal educational settings in relation to cognitive

and/or behavioural performances in a particular domain. Secondary units of analysis are often the intervention designs (artefacts, procedures, and so forth) themselves and the design and implementation process as such.

Subject of inquiry

As mentioned above, design-based research promotes an interactive approach, where traditional boundaries and distinctions between researchers, designers, and participants are blurred. The subject of inquiry can thus be described as collective. However, the explicit integration of participants (as co-researchers) may vary considerably within particular studies. While it is quite common, for example, to treat facilitators as co-researchers, participating students are not considered to be part of the subject of research. Since design-based research projects are predominantly carried out within formal educational settings this pattern is hardly surprising. In higher education and other adult settings, however, this common distinction between (facilitating or teaching) practitioners (as co-researchers) and other (studying) participants (as object of research) need to be critically questioned.

Methods & instruments

In addition to the five common characteristics of variants of design-based research that I have mentioned above, Wang & Hannafin (2005) also condensed nine methodic principles that are representative for the overall approach:

- Support design with research from the outset
- Set practical goals for theory development
- Conduct research in representative real-world settings
- Collaborate closely with participants
- Implement research methods systematically and purposefully
- Analyse data immediately, continuously, and retrospectively
- Refine designs continually
- Document contextual influences with design principles
- Validate the generalisability of the design

Kelly (2004) noted that these procedural descriptions (set of steps to follow) are the typical way of describing design-based research. He claims that "…unless this set of procedures is under-girded by a conceptual structure that forms the basis for the warrants for their claims, design study methods do not constitute a methodology…" (p. 118). It appears that design-based research is still in search for such a conceptual structure. I will try to address this issue in my synopsis of design-based research as an educational R&D approach.

Object of inquiry (Forschungsgegenstand)

The main, implicit or explicit, ideal object of inquiry in design-based research seems to be (cause-and-effect?) relationships between entities of the design

intervention and regularities of the (sub-)systems under investigation. A typical example would be the attempt to isolate the characteristics of a design intervention that improves (causes? the improvement of) a particular cognitive performance (such as reading comprehension) among students of a particular age. A secondary object of inquiry is often the design and implementation process itself.

Knowledge-constitutive interest

Design-based research seems to be largely set in the tradition of applied social science (following the engineering model). It thus focuses, almost exclusively, on an instrumental knowledge-constitutive interest that aims for effective control and manipulation. In particular, it strives for design interventions that can "produce" pre-defined educational outcomes on the individual and collective level. What remains rather obscure within the literature on design-based research is the nature of the type of "instrumental knowledge" that it hopes to produce. While many proponents seem to argue for the production of heuristic-instrumental knowledge in the form of guidelines, profiles, frameworks, and so forth, there regularly appears an intellectual "undercurrent" that still seems to take the ideal of nomologic-instrumental knowledge as the ultimate point of orientation (see for example Shavelson & Phillips, 2003).

3.5.2.3 System of change

Type of intended change

I think it is fair to say that design-based research is predominantly engaged in what I have described as either morphostatic or incremental change in education. The insistence on grounding its work in (often domain specific) instructional theory seems to drive many design-based research proponents to focus either on working out deficiencies within the system(s) of concern while keeping the larger system running (morphostatic change), or on improving the systems performance by tuning particular components or sub-systems (incremental change) with the hope that this eventually leads to more fundamental (transitional or transformational) change over time.

Subject of change

The subject of change in design-based research is the researchers/ designers and the collaborating practitioners. Though it is often not made explicit, design-based research seems to maintain the idea of a gradual abstraction and refinement of general "theory" that will at some point allow practitioners to bring about intended change by its mere application in a broad range of contexts.

Change levers & instruments

The main instrument for change that design-based research promotes is the

development of robust "theory" and thus, ideally, (cause-effect?) relationships between entities of design interventions and regularities of (sub-)systems of concern.

Object of change

The object of change in design-based research is the "improvement" of particular (often domain-specific) performances of individual or aggregated (sub-)systems. An example would be again the improvement of a particular cognitive performance (such as reading comprehension) on an individual or group level.

Direction of intended change

Design-based research is definitely interested in planned change and planned trajectories of change. In fact, design-based research seems to treat its "ends" (for change) in a rather uncritical, or self-evident, manner. It tends to derive (domain-specific) instructional problems that occur within wider systems of formal education and then focuses on improving the identified deficiencies through systematic design interventions.

3.5.2.4 Reflective synopsis on the design-based research approach

Among the contemporary educational R&D approaches that make an explicit attempt of embracing practise, the design-based research approach has gained considerable attention and popularity in recent years. However, the majority of its proponents seem to be still firmly rooted within the tradition of applied social science and its focus on "theory" (see for example Barab & Squire, 2004; Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; diSessa & Cobb, 2004; Schoenfeld, 2006). A closer examination of the literature on design-based research reveals different (potentially incommensurable?) positions regarding the role of theory within design-based research, and the type of "theory" design-based research should intend to produce. Thus it is no surprise that some scholars (see for example A. E. Kelly, 2004) raise the general question if design-based research is actually based on a coherent, argumentative rationale (Kelly calls it "argumentative grammar") for the methods and knowledge claims it seems to promote. For Kelly (2004)

> an argumentative grammar is the logic that guides the use of a method and that supports reasoning about its data. It supplies the logos (reason, rationale) in the methodology (method + logos) and is the basis for the warrant for the claims that arise (p. 118).

In this regard design-based research actually appears as somewhat incoherent and problematic. While its proponents promote and carry out design interventions in practise settings, they often maintain and defend the idea of the primacy of "theory" without making explicit what type of theory (and its attached knowledge claims) they are hoping to produce. It often appears as if design-based research proponents want to maintain an ideal of

"scientific" rationale and (universal) knowledge claims that does not seem to fit with their own focus on intervention in contextualised practise. Thus, design-based research tends to hide the (methodological) consequences of its own positioning behind the evocation of an alleged focus on "theory".

Some examples from the literature might help to illustrate the current state of affairs. diSessa & Cobb (2004), for example, suggest that "when people refer to theories in the context of design experiments, they are often referring to domain specific instructional theories" (p. 83). The same authors add that "…design research will not be particularly progressive in the long run if the motivation for conducting experiments is restricted to that of producing domain specific instructional theories" (p. 83). Instead, diSessa & Cobb (2004) promote a focus on what they call "ontological innovation" but what might be better described as the formation of theoretical constructs. They see these theoretical constructs as "constituents of an interpretive framework that enables us to make sense of certain… phenomena" (p. 98) and that "is of value to the extent that it enables us to see and account for patterns and regularities that can inform pedagogical and design decisions" (p. 99). Thus, It seems that what is often described as "theory development" in the design-based research literature might be better labelled as construct formation, or framework generation with the intent to orient action and practise.

On the other hand, Shavelson & Phillips (2003) postulate that design-based research needs to ultimately follow the "intent to establish cause and effect" (p. 28) and they add that they "believe that randomized experiments, quasi-experiments, and causal models have a role to play in design studies". Fundamentally, design-based research is supposed to seek causal agents or mechanisms. Shavelson & Phillips (2003) write:

> How does x cause y? It might be asked once a systematic effect between x and y has been established, or, alternatively, underlying theory might drive the question. In design studies theory often drives the design of activities or artifacts with a tentative causal explanation or mechanism. Through iterative tryout-redesign-tryout, claims for understanding the mechanism are advanced, and the question of replicability and generalizability then comes into play (p. 28).

However, such a claim produces a somewhat difficult situation for design-based research proponents who regularly feel obliged to evaluate their own approach in the light of the rationale of the natural science-engineering model. Thus, attesting design-based research methodological weaknesses of various kinds. This sometimes culminates in statements like the following:

> It is also the responsibility of the design-based researcher to remember that claims are based on researcher influenced contexts and, as such, may not be generalizable to other contexts of implementation where the researcher does not so directly influence the context (Barab & Squire, 2004, p. 10).

A somewhat surprising, if not slightly paradoxical, assertion from authors that claim to adhere to the interventionist orientation of design-based research

in the first place. It sometimes appears almost as if design-based research tries to negate, or at least downplay, its interventionist orientation and intentionality.

Design-based research seems to ignore value-rational questions that typically arise when one (intentionally) intervenes into practise settings. Its emphasis on "theory" and former "research" suggests that its ends (and change intents) are somewhat given and beyond critical examination. It thus displays an "engineering" attitude that is mostly geared to bringing about morphostatic or incremental change within the boundaries of the existing (educational) systems and its sub-systems. Deficiencies are generally identified and addressed on the individual (or group) level of performance and become the anchor points for planned change through design interventions. The wider system and the role of intention(s) of its various agents is generally not addressed in any systematic way. Fishman, Marx, Blumfeld, Krajcik, & Soloway (2004) seem to second this perspective when they attest that "…much design based research focuses on a designed product or resultant theory and not the system variables that impact the scaling potential of the work beyond the sites where the research was carried out" (p. 69). Some design-based research proponents appear to acknowledge these blind spots. Barab & Squire (2004), for example, write that

> when we leave the relatively impoverished context of the classroom… boundaries become less defined and more problematic… we need to remember that the world does not divide itself at researcher-defined seams. These seams, rather than being black-boxed or ignored, must be problematized and examined as part of design work, helping to lend both ecological and consequential validity to our work (p. 12).

While this diagnosis seems to be correct, it appears that the authors' proposal for a deeper analysis of the "role of context" (Barab & Squire, 2004) ignores the (potential) role of intentional change and its attached value rational questions for the clarifications of such boundaries. Though design-based research claims a pragmatic, interventionist orientation, it doesn't seem to provide any conceptual and methodological means to address practical-phronetic or developmental-emancipatory issues. Design-based research seems to be following predominantly instrumental knowledge-constitutive interests. Some proponents appear to be deeply rooted in the notion of applied social science following the natural science/engineering model, thus proposing a quest for essentially nomologic-instrumental knowledge, while others seem to rather focus on the production of heuristic-instrumental knowledge (in the form of guidelines, principles, frameworks, and so forth).

3.5.3 Systemic design inquiry

3.5.3.1 The system design approach

The system design in education approach, formulated and promoted by Banathy (1988, 1991, 1992, 1994) and adopted and applied by Reigeluth and

others (see for example Jenks, 1994; Jenlink, 2004; Joseph & Reigeluth, 2010; Reigeluth, 1994, 1995; Reigeluth & Garfinkle, 1994; Stokes & Carr-Chellman, 2007), shall serve as the prototypical example of an R&D approach within the category of systemic design inquiry. Banathy developed his approach to educational research and development on the basis of ideas from general systems philosophy, -theory, and -methodology. While early attempts to make use of systems thinking in the social realm were largely inspired by cybernetic concepts from systems engineering and oriented by a closed system view, systems inquiry gradually expanded its conceptual and methodological scope to dynamic, open systems of various kinds. Especially this later development of general system theory formed the basis for Banathy's system design approach. In retrospect it appears that "applications of system inquiry in education have followed, with a considerable time lag, the evolution of systems inquiry" (Banathy, 1988, p. 194).

Banathy (1988) understands and conceptualises "education as a dynamic and complex social system that operates in ever-changing environments and is interacting with a variety of other societal systems" (p. 200). System thinking and inquiry is used to explore, describe, and understand such systems. However, the system design approach is not a mere analytical project. Its dominant idea and focus is the design of "ideal" (better) human activity systems in education. Banathy (1988) summarises this position in the following words:

> "The central and dominant idea of design in the context of human activity systems is that we can give direction to change and we can take charge of our future, provided we create an ideal image of the future we aspire to attain and engage in a disciplined inquiry by which to realize that future" (p. 206).

The system design approach thus uses a combination of conceptual tools and methods to guide its analytical and design efforts, which will be described in more detail in the following outline of its system of inquiry.

3.5.3.2 System of inquiry

Unit of analysis

The main unit of analysis are wider systems of activity (and their subsystems). Studies tend to focus on the analysis of the underlying regularities of wider educational systems, such as entire school districts or entire regional public systems.

Subject of inquiry

The system design in education approach also promotes an interactive approach, blurring traditional boundaries and distinctions. It proposes the systematic integration of stakeholders and (potential) participants as co-designers within a collective subject of inquiry. It seems to take a more comprehensive perspective than design-based research on that matter. In fact,

it demands the involvement of stakeholders and (potential) participants already in the early phases of analysis, modelling, and re-design of the system(s) of concern.

Methods & instruments

Banathy (1988) organises key methods and instruments for analysis, design and development into three main domains of systems inquiry: systems analysis & description, systems design, and systems implementation & development.

Systems analysis & description

The systems analysis & description domain focuses on the analysis and understanding of a system of concern. Its key instruments are a *systems model approach* (macro-analysis) and a *systems process analysis* (micro-analysis).

The *systems model approach* uses three different analytical "lenses" to produce a set of models. The system-environment lens looks at the system in its context. The functions/structure is used to model a functional and structural snapshot of the system at a point in time. The process-focused lens concentrates on modelling the operation of system through time.

The *systems process analysis*, however, attempts a microanalysis of certain performance variables of the system (such as "information flow").

Systems design

The systems design domain comprises of the actual design inquiry. While the actual selection and combination of design methods depend on the unique case at hand, Banathy (1988) suggests organising the design inquiry into four phases:

Front-end analysis (problem description, definition of guiding values)

Design of the ideal system

Design of the enabling systems

Implementation planning

Systematic stakeholder involvement and participatory design are key element of all phases of the design inquiry.

Systems implementation & development

The systems implementation & development inquiry domain focuses on the design of a, so-called, change delivery system and the institutionalisation of change within the system. Key functions of such a change system are…

- the definition and communication of a change vision and its rationale
- the consideration of change barriers and the identification of resources for the institutional adaptation and institutionalisation of the intended change
- the organisation of preparation, orientation and professional development of actors within the system

Object of inquiry (Forschungsgegenstand)

The main object of inquiry in the system design approach seems to be wider

activity systems (or ecology of systems) and their development through design. A typical example would be the design and implementation of an "ideal" educational system in a particular, local or regional context. This could comprise a variety of institutionalised activity systems on various levels.

Knowledge-constitutive interest

The knowledge-constitutive interest in the system design approach seems to be predominantly focused on a combination of instrumental and practical aims. On one hand systemic change tries to produce instrumental knowledge that helps to bring about intended change through the design, or re-design, of entire activity systems. On the other hand, it also pursues the systematic deliberation of an "ideal" future system within a collective community of inquiry, thus addressing value-rational questions in an explicit manner. One can also attest an emancipatory interest, since the system design approach supports the collaborative analysis of the status quo and the creation of alternative, future systems within a community of inquiry and co-design.

3.5.3.3 System of change

Type of intended change

Systemic change in education aims for transitional, or even transformational, change. It tries to induce new organisational states within the wider activity system through the (re-)design of its underlying regularities and/or sub-systems (transitional change) and tries to support the stabilisation of these changes on a new qualitative level (transformational change).

Subject of change

The subject of change within the systemic change in education approach is basically identical with the subject of research. Researchers, (potential) participants and other stakeholders all work together as co-designers of the new, ideal system and collectively take responsibility for bringing about the intended change.

Change levers & instruments

The main change levers within this approach are the underlying regularities and (inter-)relations of the overall system and its sub-systems. Since systemic change in education makes ample use of concepts from systems thinking it explicitly goes beyond simple cause-and-effect relationships and allows for alternative forms of causality. The main instruments for change seem to be a variety of analytical lenses and system modelling activities on various levels.

Object of change

The system design in education approach defines (wider) activity systems (or an ecology of activity systems) as its object of change.

Direction of intended change

Systemic change in education combines ideas of emergent and planned change in its approach. It doesn't start from a pre-defined concept of an "ideal" future system. Instead, it engages a community of inquiry in the exploration, analysis and modelling of the current system of concern, and only gradually develops a collective vision and understanding of a design ideal. This ideal, however, later serves as the anchor point for the design and implementation efforts, which become gradually more geared to bringing about the intended change. This later phase can certainly be described as an attempt to follow a planned change trajectory, even if the "ideal" can only be approximated within one particular cycle of implementation.

3.5.3.4 Reflective synopsis on the system design approach

An outstanding feature of the system design approach is the clear articulation of its change interest and teleologic orientation: "Systems design in the context of human activity systems is a future-creating disciplined inquiry. People engage in design in order to devise and implement a new system, based on their vision of what that system should be" (Banathy, 1994, p. 27). Its main methodological response to issues of value rationality and emancipatory interests lies in its conception of *design conversation* as a particular form of discourse. Jenlink (2004) states, for example, that

> the nature of design conversation as communicative and emancipatory action relies on discourses that are democratizing and authentically participative. Design conversation provides a public sphere, in which participants' voices are valued, listened to, and have a primary role in determining the conceptions and actions necessary for designing a new system... (p. 238).

This means that individuals who are (potentially) involved or affected by the system of concern need to take part in, and take responsibility for, the design process. Banathy (1996) reminds us that "...when it comes to the design of social and societal systems of all kinds, it is the users, the people in the system, who are the experts..." (p. 228). In particular, the user-(co-)designers need to be involved in creating the "ideal" of the new (or re-designed) system. In the design "ideal" core values (such as equity, equality, social inclusion, and so forth) are expressed. "Examining the sociohistorical and sociocultural context, in which the design of educational systems is situated, illuminates the need" (Jenlink, 2004, p. 242) for such values. They guide the overall design and implementation process. Design conversation is understood as a critical (discourse) practise that frames and guides the collective (co-)design process. It integrates different types of discourse, for example generic and strategic dialogue (see Banathy, 1996), and is informed by general discourse ethics (Jenlink, 2004) to adequately deal with diverse perspectives and normative ideas of what is "good" or "an improvement".

The system design approach makes ample use of conceptual tools and methods from general systems theory. While this in principle allows for

modelling activities on very different levels of abstraction, the individual (human system) and her activity doesn't tend to be a central concern of its analytical or (intervention) design efforts. Since the main object of inquiry and change within this approach are wider activity systems, the methods and instruments for analysis and design have been constructed and refined accordingly. Altogether, system design is less concerned with isolating particular cause-effect relationships. Instead, it emphasises an orientation toward the "comprehensive" analysis and design of wider systems of activity. Obviously, such "comprehensive" system design (or re-design) efforts require rather long-term, resource intensive, engagements of collaborative inquiry.

3.5.4 Systemic intervention inquiry

3.5.4.1 The expansive developmental research approach

The prototypical example within this category of R&D approach is the *expansive developmental research* approach, originally formulated by Engeström (1987) and then developed further by Engeström and his collaborators at the Center for Research on Activity, Development and Learning (CRADLE) at the University of Helsinki. One particular strand of CRADLE's research efforts applies this approach to the development and transformation of activity systems in (predominantly institutionalised) work settings and is also known under the title of "developmental work research" (see for example Engeström, 1993, 1999, 2007; Engeström, Engeström, & Vähäaho, 1999; Engeström & Kerosuo, 2007; Engeström, Virkkunen, Helle, Pihlaja, & Poikela, 2005; Miettinen & Virkkunen, 2005; Toiviainen, 2007; Toiviainen & Engeström, 2009; Tuomi-Gröhn & Engeström, 2003; Tuomi-Gröhn, Engeström, & Young, 2003; Virkkunen & Kuutti, 2000).

The expansive developmental research approach is firmly grounded in the cultural-historical tradition of theorising on human activity in general, and in a particular (re-)interpretation of the works of the Russian psychologists Lev Vygotsky, Alexei Leontiev (also spelled Leont'ev) and others. In addition, it explicitly references some core concepts of Marxist social theory (for example, the notion of the inevitable, primary contradiction of use value and exchange value in capitalist societies; and the notion of "work" being the prototypical activity of human society). A central concept of the cultural-historical school of thought is the notion that the interaction of human agents (or actors) with the world (the subject - object relation) is inevitably mediated by cultural means (instruments). Cultural means include signs, concepts, theories, artefacts, as well as norms and standards of practise that individuals internalise through their participation in social practise and collective (material) activities. This process of internalisation is complemented by a process of externalisation in which forms of thought, cognition, and action are reified (or objectified) into

cultural artefacts that in turn serve as means in (collective) activity.

Engeström (1987) developed a generic model of (collective) activity systems and their basic, interrelated components. In this model the (collective) subject and the object of activity is not only mediated by cultural means (instruments) but also by (social) rules and the division of labour that have emerged over time. Engeström summarises a number of additional theoretical principles that are embedded in and drive the use of this model of activity systems:

The main unit of analysis are collective, mediated, and object-oriented (gegenständliche) activity systems (that are connected to other activity systems).

Activity systems are multi-voiced in the sense that participants all carry their own history, position, and perspective. This is often a source of trouble and tension but it can also spur change and innovation.

Activity systems get shaped and formed over lengthy periods of time. Their historicity is an important key to understanding and thus needs to be studied in relation to the object(s) of activity and the cultural means (instruments) that have shaped the activity over time.

Historically accumulated contradictions are a central source of change and development. For Engeström (2001) "the primary contradiction of activities in capitalism is that between the use value and exchange value of commodities. This primary contradiction pervades all elements of our activity systems" (p. 137). In many cases, so called, secondary contradictions arise when new elements (such as a new technology or a new object (Gegenstand)) enter an activity system, thus colliding, for instance, with established rules or division of labour.

In principle, activity systems hold the potential for expansive transformations. Qualitative transformations tend to take place through relatively long cycles of development. Mounting contradictions are often expressed through deviant behaviour and actions of individuals. While these are often initially suppressed, they may turn into purposeful, collective change efforts that results in the re-conceptualisation of the object(s) of activity and the (re-)design of the mediating cultural means (the *remediation* of activity).

The focus of the expansive developmental research approach is to study the conditions for change and to support the qualitative transformation of activity systems through systematic intervention. Ideally, it engages an activity system into expansive learning activity. The object of such learning activity "...is the entire activity system in which the learners are engaged. Expansive learning activity produces culturally new patterns of activity. Expansive learning at work produces new forms of work activity..." (p. 139). In an earlier account Engeström (1994) summarises the “historical mission” and conceptual focus of this approach in the following words:

> Expansive developmental research aims at making cycles of expansive transition collectively mastered journeys through zones of proximal development. In other words, it aims at furnishing people with tertiary and secondary instruments necessary for the mastery of qualitative transformations of their activity systems (p. 337).

3.5.4.2 System of inquiry

In abstract terms the system of inquiry that expansive developmental research promotes focuses on the study and development of systems of activity in practise settings.

Unit of analysis

The main unit of analysis are systems of activity, their components, and alleged, historically accumulated, contradictions.

Subject of inquiry

The subject of inquiry in expansive developmental research is also envisioned as collective. Researchers collaborate with participants that belong to the collective subject of the activity system under investigation.

Methods & instruments

Methods and instruments are organised around the, so-called, methodological cycle of expansive developmental research:

1. Phenomenology and delineation of the activity system

   The methodological cycle begins with an attempt to "grasp the need state and the primary contradiction beneath the surface of the problems, doubts and uncertainties experienced among the participants of the activity" (p. 324). A variety of methods (such as participant observation, interviewing, studying of documented discussions concerning the activity, and so forth) might be used to accomplish that. Since expansive developmental research deals with concrete activity in particular practise settings, it needs to delineate the boundaries of a particular activity system (participating people, locations, and so forth) as its object of inquiry.

2. Analysis of activity

   The next step within the methodological cycle is then dedicated to the analysis of the delineated activity system. Engeström (1987) suggests running an analysis from three distinct perspectives. An *object-historical analysis* tries to trace the developmental stages transitions, and secondary contradictions of the activity system under investigation and its object (Gegenstand) of activity. This is usually done by using the general model of activity systems as an instrument. A *theory-historical analysis* then focuses on the historically developed and accumulated instruments within an activity system. This includes conceptual instruments (such concepts, models, theories) and their expression and objectification as artefacts of various kinds (handbooks, instructions, forms, procedures,

and so forth). The *actual-empirical analysis* finally focuses on "the internalized and invented models professed and actually used or upheld by the participants of the activity (p. 326). One "outcome of the analyses is a hypothetic picture of the next, more advanced developmental form of the activity system" (Engeström, 1987, p. 327). The ultimate aim of the overall analysis, however, is the revelation of the inner contradictions of the activity and their possible aggravation. Fundamentally, this should allow for the "identification of the current collective zone of proximal development in that community of practise. The zone is a contested area between the traditional practise and alternative future directions" (Engeström, 1994, p. 43). Naturally, a hypothetic picture of the next developmental form of the activity system will remain somewhat sketchy at this stage.

3. Formation of new instruments

   In the next step of the methodological cycle the participants of the activity system under investigation are led to create, and then put into practise, new conceptual instruments that have the potential to resolve the contradictions and problematic aspects that have been unearthed during the analysis of the activity. Participants are engaging in tasks of problem finding and problem solving, thus creating and formulating a new, general instrumental model (and possibly derivative models) to form an orientation bases (Engeström, 1994). Engeström (1987) emphasises that no matter how well tasks are designed there is a chance that "the new model represents the given new and thus includes the aspect of guided or even imposed acquisition" (p. 330). Engeström therefore promotes the construction of, so called, *microcosms* for examining and elaborating the instrumental models and turning them into new forms of practise. "A microcosm is a social test-bench and a spearhead of the coming culturally more advanced form of the activity system" (Engeström, 1987, p. 334). For the successful formation of such social test-benches participants need to go through developmental forms of inter-subjectivity and collaboration: co-ordination, co-operation, and reflective communication.

4. Practical application of new instruments

   The new conceptual instruments need to be put to practise. They

   > can only be implemented in selected strategic tasks. Such tasks represent the points of probable breakthroughs into the qualitatively more advanced form of practise. In carrying out these tasks with the help of the new instruments, the participants of the activity system face intense conflicts between the old and the given new ways of doing and thinking... (Engeström, 1987, p. 334).

   Research in this phase mustn't only record the occurrence of such conflicts. Instead, it is supposed to trace and analyse the practical, often unexpected and surprising, solutions created by the participants within

the activity system of concern.

5. Reporting and evaluation

   The final step within the methodological cycle focuses on the reporting and evaluation of the outcomes of the expansive research effort. Engeström suggests a multi-methods approach here that combines observational data gathering of various kind with cognitive and historical analysis. The main organisational principle for the reporting is described in the following words:

   > One should apply the historico-generic method also in the presentation of the research findings. In other words, one should reproduce the actual course of the expansive transition, following its basic temporal structure. This does not exclude seemingly atemporal excursions and digressions into conceptual, descriptive, statistic, experimental ad comparative terrains (Engeström, 1987, p. 334).

The change laboratory method

In recent years, some core steps of this general methodological cycle have been further elaborated and condensed in the "*change laboratory method*" that is mostly applied in organisational (work) settings (see for example Engeström, 2007; Engeström, et al., 2005; Sannino, 2008) to develop activity systems and their work practises. The change laboratory draws on a combination of participant observation, interviews, and audio-, video recordings of meetings, discussions, and work practises. "In the change laboratory, pieces of data (for instance, in the form of video excerpts) are used as a 'mirror' to enhance participants' critical reflections on their work practices" (Miettinen, et al., 2009, p. 1319).

Object of inquiry (Forschungsgegenstand)

The main object of research in expansive developmental research is activity systems and their development. A secondary object of inquiry is the instruments and procedures for facilitating the development of activity systems.

Knowledge-constitutive interest

Expansive developmental research combines instrumental, practical, and emancipatory knowledge-constitutive interests. On one hand, it is interested in creating instrumental knowledge on how to facilitate the analysis and (re-)modelling of activity and the (re-)design of its components (such as instruments, rules, and so forth). On the other hand, it attempts to stimulate the deliberation of practical knowledge (on intentions, values, norms, and so forth) among the participants who belong to the collective subject of an activity system under investigation. In comparison to design-based research, expansive developmental research also takes an explicit and strong emancipatory interest that focuses on the continuous growth and (self-) development of activity systems (beyond the initial research interests).

3.5.4.3 System of change

Like the systemic change approach, expansive developmental research formulates an explicit system of change that is basically overlapping with its system of inquiry. It doesn't simply want to study existing activity systems, it wants to bring about, or rather trigger and facilitate, qualitative change within such systems.

Type of intended change

Expansive developmental research also aims for transitional and transformational change. It doesn't try to achieve this through collaborative design driven by an "ideal" future state, as it is promoted within the systemic change approach. Instead, it tries to unearth and aggravate existing tensions and dissonance within a system of concern to trigger new organisational states within a zone of development (transitional). It then tries to support the collective subject of activity in its attempts to stabilise and to accomplish fundamental, irreversible change (transformational).

Subject of change

The subject of change within the expansive developmental research approach is basically identical with the collective subject of the activity system of concern. Researchers take a more facilitative role and are not considered to be the main agents of change.

Change levers & instruments

The main change levers within this approach are the underlying regularities of the activity system of concern. Particular importance is assigned to the alleged "contradictions" between the various components of the activity system. A key role is assigned to the re-conceptualisation of the "object"(Gegenstand) of activity. The system component "instruments" is also often singled out as a particularly powerful lever for change and systematically exploited for the, so-called, re-mediation of activity.

Object of change

The object of change in expansive developmental research is the development of qualitatively different (new) activity systems. A typical example would be the further development of a shared object of activity and its re-mediation (through the development of new instruments, such as models, artefacts, and so forth) by the collective subject of an activity system.

Direction of intended change

Expansive developmental research focuses on emergent change and emergent change trajectories. Its interventions aim on triggering and aggravating tensions and historically accumulated contradictions within an activity system of concern. However, the actual change trajectories and outcomes of a developmental change process are not specified in advance.

3.5.4.4 Reflective synopsis on the expansive developmental research approach

Expansive developmental research acknowledges the need to delineate concrete activity systems (as their systems of concern). However, it doesn't do this with the same type of openness to modelling alternatives and the selection of theory and theoretical constructs that can be found in approaches that are influenced by systems thinking and systems philosophy, such as the system design approach I reviewed above. In fact, it always delineates collective activity and activity systems making use the same model and its, somewhat orthodox, set of components. It seems important to note here that Engeström's model is based on a very particular interpretation and conception of the activity concept in general, and Leontiev's work in particular which Kaptelinin (2005) summarises nicely: "activities are understood by Engeström (1987, 1990, 1999) as collective phenomena, both in respect to the scale (as carried out by communities) and in respect to the form (as carried out collectively). Individuals, according to Engeström (1999), can only carry out actions within a larger-scale collective activity system" (p. 10). I cannot see any theoretical, nor historical, reason why one should restrict the use of the activity (Tätigkeit) concept to the collective. Other proponents (see for example Fichtner, 1996; Giest, 2004, 2007; Giest & Lompscher, 2004; Kaptelinin, 2005; Lompscher, 2006; Rückriem, 2003, 2009) of the cultural-historical school of thought in education apparently do not share Engeström's conviction that the activity concept should exclusively be used in a collective sense. While Engeström and his collaborators regularly cite Leontiev as the source of this conception, other scholar have offered a deviant interpretation of Leontiev's work. Kaptelinin (2005), for instance, writes:

> in the context of psychology activities are understood as activities of concrete individuals, even if they are carried out by the individuals collectively, that is, in collaboration with other individuals. In other words, Leontiev's (1975/1978) analysis was predominantly dealing with activities taking place at the individual level, that is, activities as units of life of individual human beings, individual subjects. Even though the possibility of extending the scope of analysis and applying the concept of activity at supra-individual levels, for instance, to consider activities of individuals as contributors to a larger-scale activity carried out by a group or organization, was clearly indicated by Leontiev, his framework was specifically developed for individual activities (i.e., activities in a "narrow sense;" cf. Leontiev, 1975/1978, p. 50). The entirety of life processes of a concrete individual, a human being, was deemed an overarching context for activities (including actions and operations)... (p. 9).

In his analysis Kaptelinin (2005) also points out that Leontiev conceptualises the object (Gegenstand) of activity as an object of individual activity (either expressed in individual or collaborative action), while for Engeström the object of activity is always a (shared) object of collective activity. It is predominantly related to the production of some outcome. This seems to be the result of Engeström's (1987) treatment of labour as "the

mother form of human activity" (p. 66) and this inclusion of "categories of Marx's political economy - production, consumption, and distribution" (Rückriem, 2009, p. 109). Rückriem (2009) also attests that

> Engeström seems to fail to take notice of Leont'ev's explicitly repeated emphasis on the strictly systemic nature of the components of individual activity. Instead, he stresses their hierarchical structure and turns them into an ontological understanding. The psychological meaning of central concepts such as 'subject' and 'intentionality' inevitably slips into a sociological understanding of activity. The same happens with the concepts of 'tool', as well as with 'instrumentality,'… (p. 109).

Kaptelinin (2005) comes to the conclusion that Engeström's "distinction between collective activities and individual actions is not consistent with the general framework developed by Leontiev" (p. 12-13).

While expansive development research offers valuable constructs and a particular model to delineate activity systems, it shows a certain tendency to ontologise some of its components. Its exclusive focus on collective activity and its restrictive use of terminology basically neglects the applicability of the activity concept (and related theoretical constructs) to the level of individuals. However, from a more systemic (and also an historic) perspective, there seems to be no good reason why individual activity and its developmental transformations could not (and should not) be described with the basic conceptual vocabulary of cultural-historical activity theory. Individuals doubtlessly organise their life in (activity) structures, beyond actions and operations that cannot be necessarily described as belonging to collaborative activities (and activity systems) all the time. And even if they be described as such, the modelling intent might be different and not geared towards the understanding and developmental transformation of (collective) activity systems. To be fair, expansive developmental research makes its system of inquiry and system of (intended) change quite clear. Only its very restrictive application of theoretical constructs, unnecessarily limits its approach to the study and change of collective activity.

Its focus on transitional and transformational change of activity systems, however, is an outstanding feature of expansive developmental research. This focus is combined with an interest in emergent, collective change and emergent change trajectories. Another aspect that sets expansive development apart is its focus on the mediation of human action and activity with cultural means (instruments) of various kinds. The identification and examination of artefacts (as externalised and reified practise) and the role they play in the current state of an activity system and its historic development are an important part of the analytical efforts within expansive developmental research. In turn, the formation and practical application of new instruments is considered to be a powerful change lever.

Expansive developmental research combines instrumental, practical, and emancipatory knowledge-constitutive interests in a very particular way. Like

other approaches it is engaged in the creation of instrumental knowledge on how to facilitate the analysis and (re-)modelling of activity and the (re-)design of its components (such as instruments, rules, and so forth). It also attempts to stimulate the deliberation of practical knowledge (on intentions, values, norms, and so forth) among the participants within an activity system. What seems to be amiss, however, is a critical and systematic treatment of the boundary judgements (and assumptions) that go into its initial system modelling attempts. The approach seems to always revert to the same type of activity system model, type of intervention, and change intent. Its explicit emancipatory interest seems to focus exclusively on the continuous growth and (self-)development of activity systems. Therefore, individual change and development appears only as a by-product of such collective change processes and never seems to be an object of inquiry and change in its own right.

3.5.5 Reflective practise inquiry

3.5.5.1 The self-organised/conversational learning approach

In the (personal) reflective practise category I have chosen the self-organised/conversational learning approach as it was originally formulated by Thomas & Harri-Augstein (L. Thomas & Harri-Augstein, 1985) and then developed by Thomas and Harri-Augstein and their collaborators (see for example Harri-Augstein & Cameron-Webb, 1996; Harri-Augstein & Thomas, 1991; L. Thomas & Harri-Augstein, 2001) at the Centre for human learning at Brunel University, UK. Another obvious contender would have been the reflective practise approach formulated and developed by Schön and Argyris (Argyris, 1970; Argyris, Putnam, & McLain Smith, 1985; Schön, 1983, 1987, 1991, 1995). However, since these authors have made the most explicit attempt to ground their work in an action science framework (Argyris, et al., 1985) I have decided to review the self-organised/conversational learning approach instead and to come back to the work of Agyris et al. (1985) in the context of an attempted synthesis of the methodological concerns and implications raised throughout this comparative analysis.

The self-organised/conversational learning approach discards the natural science/engineering model of science. Instead, it operates within the conceptual framework of *conversational science* that holds the key assertion that the "unique attribute of humans is that they 'converse'" (p. 6) with the world, themselves, and others through the construction and attribution of meaning to artefacts, people, and events. This notion is largely inspired by George A. Kelly's psychology of personal constructs and his metaphorical concept of "man as scientist" (1955) that emphasises that all personal knowing is relative, and that people construct systems of meaning and (theoretical) models of reality on the basis of their experiences. These personal systems of meaning

and personal models then guide action, and are continuously validated (or challenged) through action. Another significant source of inspiration were ideas and concepts formulated in the context of second-order cybernetics, such as the *conversation theory* by Gordon Pask (1975). Harri-Augstein & Thomas (1991) note that "from the perspective of the paradigm of conversational science, events in the outside world do not produce predictable consequences; it is the meaning attributed to the event which become the 'conversational cause'..." (p. 31). Therefore, they propose that "…the conversational individual, the conversational constructor of personal meaning, the conversational learner, is the irreducible element for investigating human learning" (p. 31). It should be noted that conceptually the "conversational learner, the conversational entity which is the locus of learning, can be represented by more than one person" (p. 32), though the overall approach seems to primarily evolve around supporting individual persons as conversational learners.

Naturally, the ongoing construction of personal meaning and models on the basis of personal experience and action, takes also place in relation to conceptions of learning (one's capacity and limitations for learning, the learning process in general, and so forth) and models of learning activity. Through socialisation and exposure to formal systems of instruction, many people arrive at rather disabling convictions, so called *myths*, about their own learning (processes) and themselves as learners. In addition, they often develop personal models of learning activity that are completely dependent on being organised and controlled by others (mainly through instruction). This is precisely where the self-organised/conversational learning approach tries to intervene and bring about intended change. Through the use of content independent, reflective-conversational tools and procedures (such as learning conversations, personal learning contracts, and so forth), it wants to challenge the (potentially disabling) personal systems of meaning and processes of meaning construction and help individuals (and collectives) to re-model and develop their learning activity. Noteworthy is the proposal and attempt to treat personal learning activity as essentially "content-independent", in the sense that it can be turned into an object of inquiry and change in its own right, thus leaving it to the individual person to define their own concrete contents, or objectives, on the basis of personal needs and interests. While the content control lies with the participant, the interventionist practitioner initially controls the process through the use of conversational-reflective tools and procedures. This asymmetric constellation is seen as a transitional mode. Over time, the aim is to support the full internalisation and appropriation of such conversational-reflective tools and procedures by the individual participant who becomes more and more able to control and manage both content and process of her learning activity.

3.5.5.2 System of inquiry

In abstract terms the system of inquiry that the self-organised/conversational learning approach promotes, focuses on individual experience and (learning) activity in practise settings.

Unit of analysis

The main unit of analysis are personal systems of meaning and learning activity of a "conversational individual".

Subject of inquiry

The subject of inquiry is mostly the individual participant as "conversational individual" (though collectives like groups, team, organisations, can also be understood as such) who is assisted by the researchers/coaches. Researchers/coaches only provide, content free, reflective and conversational tools and procedures to guide the (self-)analysis and re-modelling efforts of the "conversational learner".

Methods & instruments

The main instruments and methods used are the *learning conversation* framework, the *personal learning contract* procedure, and the use of various forms of the *repertory grid method* to elicit personal systems of meaning. These instruments can be complemented by a wide range of more specialist, reflective-conversational tools (see Harri-Augstein & Thomas, 1991 for a full taxonomy of such tools).

The learning conversation

In the self-organised/conversational learning approach, the framework of *learning conversation* provides an operational terminology and helps to orientate the intervention efforts. Learning conversations can shift from an activity-*oriented* level (Harri-Augstein & Thomas call this level either "tutorial" or "task-oriented") to either a *learning-to-learn* oriented, or *life-relevance* oriented level. The central level is the activity-oriented level. On this level, the conversation focuses on the exploration and monitoring of a concrete learning activity. This is usually done in relation to a series of specific learning events, episodes, tasks, or projects (with the help of the learning contract procedure). Should the execution of such projects highlight problems, shortcomings, deficits, the learning conversation can then shift to the learning-to-learn level and address missing personal dispositions (skills, attitudes, and so forth) and how to attain them. If a sustained engagement with the learning activity becomes problematic and motivational deficits become apparent, the learning conversation shifts to a life-relevance level, trying to explore and refocus the personal relevance of the learning activity.

Personal learning contracts

The main reflective-conversational tool that is used on the activity-oriented level is the *personal learning contract* procedure. Personal learning contracts are

generated and controlled by individuals. They focus on the initial description, monitoring, review, and evaluation of specific events, episodes, or projects as the concrete expression of learning activity. The initial description outlines the overall topic/task (the what of the intended learning and change), the purpose (the why), the strategy (the how, in terms of actions and resources), and the outcomes (the intended results/products and criteria of evaluation). The procedure is structured over time into planning, action, and review cycles. Within each cycle personal records of action and items of reflected experience are documented. In addition, topic/task, purpose, strategy, and outcome descriptions are reflected upon and adapted if necessary. On completion of the overall action phase (or series of cycles) the overall process is reviewed and the direction of development and the formulation of the next personal learning contract (and underlying project or episode) is considered.

Repertory grid method

For an in-depth exploration of personal systems of meaning (personal construct systems) in relation to emerging (learning) needs and learning activities, the self-organised/conversational learning approach employs a variety of procedures that are all based on the repertory grid method, originally conceived and created by George A. Kelly as a form of structured elicitation of personal construct systems in clinical contexts. It is important to note that the repertory grid variants that are applied within the self-organised/conversational learning approach are all used within its overall conversational framework. This means that the actual experiential material or content that is explored and the elicitation of personal constructs is controlled and interpreted by the participant individuals (for practical example of how repertory grids can be used in the context of learning conversations, see Harri-Augstein & Cameron-Webb, 1996).

Object of inquiry (Forschungsgegenstand)

The main object of inquiry in self-organised/conversational learning is the (developing) personal systems of meaning and the personal models of (learning) activity of individuals (or collectives). A secondary object of inquiry is the overall conversational coaching approach and its variety of reflective-conversational tools and procedures.

Knowledge-constitutive interest

The knowledge-constitutive interests that can be traced within the self-organised/conversational approach seem to be a combination of instrumental, practical, and emancipatory. Like the expansive developmental research approach, there is a clear interest in creating (heuristic-)instrumental knowledge on how self-analysis, reflection, and re-modelling of personal systems of meaning and personal models of activity can be supported. With its focus on self-determined needs and objectives, it helps individuals to deliberate and

construct practical knowledge on personal ends and means. Finally, this approach follows a strong emancipatory notion emphasising the personal liberation from automatic "behavioural robots" and the processing of experience (Harri-Augstein & Cameron-Webb, 1996; Harri-Augstein & Thomas, 1991; L. Thomas & Harri-Augstein, 1985, 2001) within equally unreflected systems of meaning (personal construct systems). The application and gradual internalisation of conversational, reflective tools and procedures is assumed to support individual growth and development according to personal needs.

3.5.5.3 System of change

The self-organised/conversational approach operates within an explicit system of intentional change that is basically overlapping with its system of inquiry. Individual systems of meaning and personal models of (learning) activity are not studied per se. Instead, individuals are provided with a set of content-free, reflective-conversational tools and procedures that are designed to define and support their own change efforts.

Type of intended change

Like the expansive developmental research approach, the self-organised/learning approach aims for transitional and transformational change, albeit predominantly on a more individual level. Through reflective-conversational practises the current, personal systems of meaning and models of activity are "objectified" and thus become accessible for review and intentional change efforts. Re-modelled (learning) activities and expanded systems of meaning then are put to test in cycles of experimental, personal learning projects put into action. Records of action and items of experience derived from these intentional change projects then becomes material for the next cycle of reflection and conversation, thus increasing the likelihood of turning transitional change into fundamental, qualitative shifts within personal systems of meaning and activity.

Subject of change

The subject of change within the self-organised/conversational learning is the individual who is initially assisted by a researcher/coach provides and guides through reflective and conversational tools and procedures. These tools and procedures are then gradually internalised and appropriated, thus enabling the individual to become a "self-organised" subject of change independent of external assistance.

Change levers & instruments

The main change levers are guided reflection and conversation on records of action, personal models of action and (learning) activity, items of experience, and personal systems of meaning. The instruments used to bring about change

are basically identical with the methods and instruments of inquiry that I have already described above. This is not really surprising, since this approach promotes the support of (self-)inquiry and change, and the gradual acquisition and internalisation of its instruments and methods by individual participants.

Object of change

The object of change within the self-organised/conversational learning approach is predominantly individual (learning) activity and the underlying personal systems of meaning and models of action that can disable or enable the overall capacity of individuals to become "self-organised" subjects of their own intentional change.

Direction of intended change

The self-organised/conversational learning approach focuses on supporting emergent change on the level of individuals (as conversational learners). Change trajectories remain unspecified and only emerge through the cyclical execution of learning projects embedded in a reflective-conversational framework. Participants explore their own (learning) needs and re-model their systems of meaning and personal models of activity in the light of experiential data and records of action gathered during the execution of such concrete learning projects.

3.5.5.4 Reflective synopsis on the self-organised/conversational learning approach

The self-organised/conversational learning approach focuses very much on the individual subject of (learning) activity and her construction of personal systems of meaning and models of action. Though it provides the conceptual flexibility to represent "the conversational individual" as a collective, it tends to focus, at least initially, on the inquiry and intentional change of the personal systems of meanings and models of action that make up the learning activity of individual human beings. In fact, its explicit focus on the personal development of learning activity guided by the ideal of a *self-organised* (adult) learner sets it apart from the other educational R&D approaches reviewed so far.

Its heuristic-instrumental, knowledge-constitutive interest seems to rest mainly on the development and refinement of conversational-reflective tools and procedures for the facilitation of the intentional development of individual (and to a lesser degree of collective) learning activity. Its focus on personal construction of meaning and models is theoretically grounded (mainly in Kelly's construct psychology) but not discussed critically and systematically in regards to its normative and value-rational contents.

Since the self-organised/conversational learning approach intentionally leaves the selection and formulation of "contents" and specific "goals" (of

learning projects) to the individual participants, it seems to locate practical-phronetic deliberations on means and ends largely on this individual level, too. Its intervention efforts thus focus on individual, largely self-defined change and its (temporary) facilitation. Institutionalised activity systems are mainly treated as a given, or background, to personal meaning making and model construction. It seems fair to say that this approach focuses more on improving how the individual can process and manage her experience, system of meaning, and individual learning activity in relation to a wide range of human activities (including formal educational activity systems, workplace settings, and so forth).

Contrasting the self-organised/conversational learning approach with expansive developmental research, shows a similarly explicit developmental-emancipatory interest, albeit with a primary focus on the individual activity in the former, and a focus on the collective activity in the latter case. One could say that self-organised/conversational learning tries to bring about transitional (potentially transformational) change via the development of individual meaning and model construction (which might result in changes on the level of collective activity later). While expansive developmental research tries to bring about transitional (potentially transformational) change via the development of collective activity (which might result in changes on the level of individuals). Both approaches, however, try to support and account for emerging change and emerging change trajectories that are not pre-determined and specified in advance.

The proposed instruments for change in these two approaches are not entirely different either. The expansive developmental research approach focuses very much on the analysis of current state and history of a particular (collective) activity system and its main, mediating cultural means (instruments). The further development of the collective "object of activity" and re-mediation through the creation of new, or re-design of existing, instruments are considered to be the main levers for change. Systematic collection of experiential and (self-) observational data, and guided reflection are an important instrument in the process. The researchers/coaches mainly act as facilitators in this process. This is also the case within the self-organised/conversational learning approach. However, here the individual is presented (by the researcher/coach) with a set of conceptual and procedural instruments to review and (re-)construct her experience (and attached systems of meaning) and models of action in relation to specific types of personal learning activity (and underlying learning episodes or projects).

Though both approaches have been developed in relation to a rather different conceptual framework and history of theorising (personal construct psychology and second-order cybernetics on one side, and the cultural-historical school of thought in psychology and Marxist socio-political theory

on the other hand), they seem to follow a somewhat compatible developmental-emancipatory interest and focus on intervention for transitional (and transformational), emergent change. Another commonality between these two approaches seems to be the use of systemic concepts (such as activity systems, or systems of meaning…) and its attached, alternative forms of (circular) causality. However, both approaches seem to be deeply grounded in their particular theoretical tradition and thus do not provide a more abstract (meta-)framework that would allow for the critical reflection of their systemic boundary judgements and activity models, and the formulation of viable alternatives.

3.5.6 Overview of comparative analysis

type of inquiry	R&D approach	system of inquiry	unit of analysis	subject of inquiry	methods & instruments	object of inquiry	knowledge-constitutive interests	system of change	change type	change subject	change levers & instruments	object of change	direction of change
traditional applied science		particular entities of (sub)systems in controlled settings	entities of (sub)systems	researchers	experiments quasi-experiments	cause effect relationships between entities	nomologic-instr.	unspecified	morphostatic incremental	practitioners	cause-effect-relationships between entities	improve aspects of [subsystems]	planned
design inquiry	design based research approach	aggregated (sub)systems in practise settings	individual & aggregated (sub)systems and its entities	researchers practitioners	see text on desing-based research approach in Part 3	(cause effect) relationships betw. entities of design interv. & regularities of subsystems	heuristic-instr. nomologic-instr.	unspecified	morphostatic incrememtal	practitioners researchers/ designers	cause-effect-relationships between entities	improve aspects of [subsystems]	planned
systemic design inquiry	system design approach	wider systems of activity in practise settings	collective activity systems	researchers practitioners stakeholders	see text on system design approach in Part 3	wider activity systems / ecology of systems and their development through design	heuristic-instr. phronetic-pract. develop.-eman.	wider systems of activity in practice settings	transitional transformational	researchers practitioners stakeholders	underlying regularities / relations system & subsystem (various forms of causality)	design better wider activity systems / ecology of systems	planned emergent
systemic intervention inquiry	expansive developmental research approach	systems of activity in practise settings	collective activity systems	researchers practitioners	see text on developmental research approach in Part 3	activity systems and their development	heuristic-instr. phronetic-pract. develop.-eman.	systems of activity in practice settings	transitional transformational	practitioners researchers/ facilitators	contradictions regularities instruments	develop qualitatively different (new) activity systems	emergent
reflective practise inquiry	self-organised/ conversational learning approach	individual experience and (learning) activity in practise settings	individual (learning) activity and personal system of meaning	researchers practitioners	see text on self-organised/ conversational learning approach in Part 3	developing personal systems of meaning & models of (learning) activity	heuristic-instr. phronetic-pract. develop.-eman.	individual experience and (learning) activity in practise settings	transitional transformational	practitioners researchers/ facilitators	reflection on action, experience, personal model of activity	develop personal activity and system of meaning	emergent

(Table 3: overview of systems of inquiry and systems of change promoted by different educational R&D approaches)

The comparative analysis above has shown that all selected educational R&D approaches promote a "turn to practise" within their systems of inquiry and an interventionist orientation driven by implicit or explicit concepts of intentional, positive change (or improvement). The above table (table 3) provides a very condensed overview of the comparative analysis. Its first row presents the key elements that generally characterise a "traditional applied science" inquiry in educational research. The following rows each hold one of the four different types of inquiries and the respective R&D approaches that were selected to represent them. Each R&D approach is broken down into the elements that were used to analyse its explicit or implicit system of inquiry and system of change.

Among other things the overview shows that three approaches (system design, expansive developmental research, self-organised/conversational learning) explicitly define a system of change with an orientation towards a transitional and transformational type of change that predominantly follows an emergent direction and trajectory. It was also attested that these three R&D approaches combine heuristic-instrumental, phronetic-practical, and developmental-emancipatory knowledge interests. Despite of these similarities and overlaps the above analysis also showed that practical-phronetic (value related) and developmental-emancipatory (power related) issues and interests are addressed in a rather partial and somewhat cursory manner from a methodologically point of view. In particular, both the expansive developmental research and the self-organised/conversational approach appeared to be too grounded in their respective theoretical traditions to allow for a critical reflection of the specific systemic boundaries they promote. Thus making it difficult to address value-rational issues in relation to intentional change and intervention (in educational practise) from a more abstract methodological perspective.

3.6 Proposals for addressing value-rational contents of practise (and intervention)

Due to the various shortcomings and weaknesses that were found within the comparative analysis of selected educational R&D approaches, I decided to expand my analytical review beyond its original scope in the hope that additional insights could be gained from conceptual and methodological proposals that had been mainly formulated in other areas of contemporary social science.

3.6.1 Phronetic social sciences

A particular vocal proposal for a re-conceptualisation and methodological re-orientation of the social sciences towards practise and attached issues of value rationality and power has been formulated in recent years by Bent Flyvbjerg (1998, 2001a, 2001b, 2004a, 2004b, 2005, 2006). Flyvbjerg rejects the view that social sciences should emulate the natural sciences (and the applied engineering

branches) by trying to produce cumulative and predictive theory. He argues that the ideal of, what he also calls, epistemic science (referencing the intellectual virtue the Aristotele calls "episteme") is simply not attainable within the social sciences. "Episteme concerns universals and the production of knowledge that is invariable in time and space and achieved with the aid of analytical rationality. Episteme corresponds to the modern scientific ideal as expressed in natural science" (Flyvbjerg, 2004b, p. 285). Flyvbjerg comments that no predictive theory, based on such epistemic rationality, has been produced in social sciences to date and that "…scientism in social science is self-defeating because the reality of social science so evidently does not live up to the ideals of scientism and natural science" (Flyvbjerg, 2001b, p. 168).

Thus, he holds the view that social sciences should rather promote value rationality, or in other words engage "in reflexive analysis and deliberation about values and interests" (Flyvbjerg, 2005, p. 38) in reference to and aimed at practise. Again in reference to Aristotele's notion of the intellectual virtue of "phronesis" (prudence or practical wisdom) Flyvbjerg denotes his proposed re-conceptualisation phronetic social science. For Flyvbjerg (2001b)

> the purpose of social science is not to develop theory, but to contribute to society's practical rationality in elucidating where we are, where we want to go, and what is desirable according to diverse sets of values and interests. The goal of the phronetic approach becomes one of contributing to society's capacity for value-rational deliberation and action (p. 167).

Such deliberation is necessarily pragmatic, variable, context-dependent, and based on judgement and experience. Consequentially, in phronetic social science "the particular and the situationally dependent are emphasized over the universal and over rules. The concrete and the practical are emphasized of the theoretical" (Flyvbjerg, 2004b, p. 289).

Flyvbjerg basically offers a contemporary re-interpretation and expansion of the Aristotelean notion of phronesis. In particular, he argues for the explicit inclusion of "power" into the analytical framework of, what he calls, phronetic social science. He (Flyvbjerg, 2001b) proposes to guide this type of social science by four value-rational questions:

1. Where are we going?
2. Who gains and who loses, and by which mechanisms of power?
2. Is this development desirable?
4. What, if anything, should we do about it?

Flyvbjerg (2004b) emphasises that "the 'we' will always be situated in relation to a specific context. Furthermore, when there is a 'we' there is also usually a 'they', especially when issues get constructed in adversarial terms…" (p. 290). In addition, these questions "are asked with the realization that there is no general and unified 'we' in relation to which the questions can be given a final, objective answer" (p. 290). From a methodological perspective, Flyvbjerg (2004b) maintains the view that

> the most important issue is not the individual method involved. Phronetic… research

> is not method-driven, even if questions of method may have some significance. Phronetic… research is problem-driven. Therefore such research does not, and cannot, subscribe a priori to a certain method… (p. 291).

Thus Flyvbjerg only formulates the following, rather broad, methodological guidelines, such as "focus on values", "place power at the core of analysis", and "study cases and contexts" (for a full list and overview of these guidelines see for example Flyvbjerg, 2001b). Even without a detailed discussion of these guidelines, it should be rather apparent that phronetic research is thus conceptualised as a predominantly "analytical project, but not a theoretical or methodological one" (Flyvbjerg, 2004b, p. 302). It explores current practises and their historic circumstances with the goal of informing "more debate about and development of the craft of situated, contextualized research about… practices and the power relations which define such practices" (p .302). While Flyvbjerg's conception of phronetic research certainly puts the analytical and methodological treatment of value rationality and issues of power on centre stage, it remains rather sketchy and ambiguous on the instrumental aspects of intervention and action. Though Flyvbjerg (2001b) seems to embrace the idea of intervention being part of phronetic research when he writes that it

> may transform social science to an activity done in public for the public, sometimes to clarify, sometimes to intervene, sometimes to generate new perspectives, and always to serve as the eyes and ears in our ongoing efforts at understanding the present and deliberating about the future (p. 166).

Phronetic research apparently "will also involve the social sciences in their role as techne. However, when combined with the element of phronesis, it will be a techne 'with a head on it,' that is, a techne governed by value-rational deliberation" (p. 168). However, Flyvbjerg fails to show how his proposed analytical and critical project of phronetic research can be (or should be) expanded if a professional (research & development) activity operates within a framework that decidedly combines a system of inquiry with an (overlapping) system of change and an outright interventionist orientation. In this case, answering the core value-rational questions that are supposed to drive phronetic research will only help to delineate the initial boundaries of a combined system of inquiry and system of change. In educational (R&D) practise the work doesn't (and indeed should not) stop when we have come to the conclusion that we actually want to do something about how things are going or developing. Thus, we would have to formulate an additional value-rational question to be addressed in a program of phronetic educational research: How should we actually go about doing something about some state of affair or development?

3.6.2 Phronesis in educational R&D

Altogether, it appears to be quite difficult to find direct references to Flyvbjerg's notion of phronetic social science and phronesis in general in field

of educational reasearch and development. An explicit treatment can be found, for example, in Willis (2008) who dedicates a full chapter to "Purposes, phronesis, and Bent Flyvbjerg" and in Rourke & Friesen (2006). However, a remarkable paper was published by Inouye, Merrill & Swan (2005) from Brigham Young University. The authors discuss how the central concern of the field of Instructional Design and Technology (ITD) could be re-conceptualised and better defined. Like Flyvbjerg (but without referencing his work), Inouye et al. (2005) make use of the Aristotelean distinction of theoresis, poesis praxis and their corresponding intellectual virtues (episteme, techne, phronesis) throughout their analysis in which they come to the following conclusion: "…help is the ultimate center of IDT's concerns. Although rarely explicitly acknowledged as our center, helping learners learn always has been the reason for the existence of IDT" (p. 4).

This, of course, puts IDT in the realm of praxis (or practise) and that has considerable implications for the discipline and its profession. Inouye et al. (2005) suggests that "Instead of looking for that which exists, our eyes should be attuned to looking for that which is wise and good to do. Seeing help at the centre would put us in the business of seeking practical wisdom and helping people, the realm of ethics and choice, rather than in the business of just searching for what is objectively real, the realm of metaphysics and invariant determination" (p. 11). According to Inouye et al. (2005), such an orientation holds the following general implications for the discipline:

- "IDT belongs to the realm of choice" (p. 12)
- "IDT's principle virtue is phronesis" (p. 13) (prudence, or practical wisdom). Because IDT involves not only artefacts but people…
- "IDT's phenomena arise from varying originative causes… Our phenomena are contingent, temporal, perishable, generated, specific, spatially located, and contextual" (p. 13).
- "IDT's activities are ends-in-themselves" (p. 14)
- "IDT's phenomena are characterized by equivocity, quantitative indeterminacy, unpredictability, irreversibility, and individuation, or lack of anonymity" (p. 14)

In addition these authors see the following implications for the profession of ITD:

- "…we should see ourselves as belonging to a helping profession with an ultimately ethical central concern" (p. 14), thus "we need not see ourselves as technologists any more then doctors see themselves as technologists" (p. 15)
- "We can now see our activities under the general rubric of helping, rather then just researching, evaluating, designing, developing, or delivering" (p. 15)
- The knowledge base of ITD should also change qualitatively. It "should become more contextual rather than a-contextual" (p. 15), "more person-centered rather than environment-centered" (p. 15), "more

agent-centered rather than object-centered" (p. 15) (object stands here for artefacts), "more psychology-centered rather than technology-centered" (p. 16), "more learner-centered and less instruction-centered" (p. 16), and "more general education-oriented in addition to being special education-oriented" (p. 16) (special is here used in the sense of specialist).

- The teaching methods within the professions need to reflect the changing practise. Inouye et al. (2005) "anticipate a greater role for narratives and case studies that encapsulate practical wisdom within stories that occur in a given time, place, and situational context" (p. 17).
- Such a conceptual shift, of course, has also considerable methodological implications and consequences. In respect to educational R&D, Inouye, Merrill & Swan suggest that

> it should be less a search for the objectively real and more a search for the subjectively helpful. Its criteria for excellence should shift from concerns about the internal and external validity of inference to include concerns about the more inclusive validity of use or consequence. It should shift also from an emphasis on cross-situational reliability to the accumulation of knowledge of helpful practices in functionally similar situations. It should be less method-driven and more problem-driven, less populations in general and more for individuals, or groups, in particular" (p. 22).

This calls for a re-conceptualisation of the standard quality measures of educational R&D and its methods. Inouye et al. (2005) emphasise that "more phronetic research, like design research, action research, qualitative praxis inquiry, naturalistic studies, and case studies might be appropriate for the realm of praxis" (p. 23). I would like to argue that the above comparative analysis of selected R&D approaches show various traces or seeds of such a phronetic research orientation, though their proponents are generally less outspoken on these issues than Inouye et al. (2005) who summarise their conception of IDT in the following words: "Like medicine, law, and psychotherapy, it is a practice (praxis) whose central concern is to help people. As in the other helping professions, art (poiesis), science (theoresis), and modern technology (a poiesis/theoresis hybrid), serve as means to ethical ends" (p. 24-25). This is a theme that has also been at the centre of discourse in some branches of system philosophy and system thinking.

3.6.3 Systematic boundary critique and systemic intervention

We have seen in the comparative review above that general system thinking and system theory concepts have influenced, either implicitly or explicitly (in the case of the Systemic Design approach), the various educational R&D approaches and their systems of inquiry and change. Since system theory and system thinking are regarded as a trans-disciplinary framework and methodology, it seems fruitful to include what its proponents have to say about (systemic) intervention into dynamic, open social systems (soft systems) and the methodological treatment of value rational contents.

3.6.3.1 The boundary concept

Churchman (1971, 1979), in particular, articulated and promoted a "shift from a view of system boundaries as 'given' in the real world, to a view of boundaries as personal or social constructs defining what is pertinent in an analysis" (Midgley, 2000, p. 150). Thus he "introduced the fundamental idea that the boundaries of analysis are crucial in determining how improvement will be defined during a systems intervention, and hence what actions will be taken" (Midgley, 2000, p. 156). Churchman focused on the central role of the professional interventionist for making the necessary boundary judgements (and value rational decisions) as part of an ongoing quest for comprehensiveness. This quest for a comprehensive understanding of a system of interest requires the systematic expansion of system boundaries and the "sweeping in" of additional stakeholders to consider ever more aspects of a problem situation.

Werner Ulrich (1987, 1988, 2001, 2003, 2007) rejects Churchman's notion of comprehensiveness. For Ulrich (2001) "boundary judgements are inevitable. They are the result of our inability to consider the 'whole system'" (p. 14). He thus explores how boundary setting and boundary judgements can be rationally justified. Like Flyvbjerg (in his conception of phronetic social science) Ulrich criticises in general the prevailing scientism in applied social sciences and its impoverished concept of (instrumental) rationality. He suggests exploring the systems concept and systems thinking as an instrument of practical and critical reason. In particular he is interested in how professional intervention (and professional practise in general) can be based on practical reason. For Ulrich "practical reason cannot be reduced to instrumental rationality" (p. 25). Following Habermas, Ulrich sees discourse communities as the fundamental source for making value judgements. This leads to the notion that "if boundaries are to be established rationally, they should be defined in dialogue by all those involved in and affected by the intervention" (Midgley, 2000, p. 175). Ulrich thus devised a conceptual framework for reflecting on the value assumptions and limitations (the normative content) of interventions into social practise.

3.6.3.2 Critical systems heuristics & systematic boundary critique

Critical systems heuristics

> aim to support critical professional practise through a critical employment of the systems idea. The methodological core idea is that all problems definitions, proposals for improvement, and evaluations of outcomes depend on prior judgements about the relevant whole system to look at... (Ulrich, 2002, p. 72).

These judgements are called "boundary judgements" since they define the boundaries of the system of concern (or reference) to which propositions refer to and claim validity for. Critical system heuristics provide a framework of boundary concepts and a corresponding set of twelve critical questions that can be used to run a, so called, *boundary critique*. Such a boundary critique can be

used to …

- identify boundary judgements systematically
- analyse alternative system boundaries (for setting a problem or evaluating a proposed solution/improvement)
- challenge any claims to knowledge, rationality, or improvement that rely on hidden or (potentially) problematic boundary judgements

Especially the third application leads for Ulrich (2002) "to an emancipatory employment of systems thinking; it offers both those involved in and those affected by professional practice a new critical competence, regardless of their theoretical knowledge or special expertise with respect to the problem in question..." (p. 72). It should be noted here that Ulrich holds the view that boundary judgements should be normatively acceptable to all "concerned citizens", and that in principle, the participation in boundary critique of planned interventions into social systems should be possible for and accessible to all citizens in a democratic society. The critical boundary questions proposed by Ulrich (1987) can help to reflect both on the boundaries of a system currently set (by planners, designers, researchers, interventionists, and so forth), and boundaries that, for instance, from the perspective of other stakeholder groups (those involved and those affected) ought to be set and used. Such questions include, for example, the following:

- who is the actual client of the system design?
- what is the actual purpose of the system design?
- who among the involved represents the concerns of the affected? who is or may be affected without being involved?
- are the affected given an opportunity to emancipate themselves from the experts?

Such critical heuristic boundary questions can be asked in the *is* and the *ought* mode. A complete overview of the 12 critical heuristic boundary questions proposed by Ulrich can be found in (Midgley, 2000, p. 141).

Altogether, critical systems heuristics intend to provide a methodic support for boundary critique, and thus for the systematic identification, reflection, and discussion of boundary judgements. Ulrich (2001) conceives such systematic boundary critique as a necessary step for the rational (re-)design of, or intervention into, social systems:

> Since nobody can ever claim comprehensiveness for his consideration of possibly relevant 'facts' (empirical observations or anticipations) and 'values' or 'norms' (normative assumptions or implications), what matters from a critical point of view is not so much how comprehensive our boundary judgement are, but rather how carefully we deal with their inevitable lack of comprehensiveness (Ulrich, 2001, p. 15).

Systematic boundary critique should thus be an important part of the problem setting and analysis phase, and inform any choice on methods and theoretical constructs or frameworks. Ulrich (2001) reminds us that "it is an error to think that we can justify our propositions by referring to the methods we use, however well informed and well reasoned the choice of those methods

may have been" (p. 20). This view also suggests a different approach to formulating and justifying validity claims. Those claims need to be qualified "by explaining to what extent and how exactly they depend on assumptions or may have implications that we cannot fully justify as researchers, but can only submit to all those concerned for critical consideration, discussion and, ultimately, choice" (p. 23). So, justification deficits should not be avoided or hidden, but made transparent and opened up to debate and critique:

> Whoever claims the objective validity of some 'facts' or the rationality of some 'conclusions' without at the same time explaining the specific boundary judgements on which the claims depend, can be shown by boundary critique to be arguing on slippery grounds (p. 24).

3.6.3.3 Systemic intervention

Midgely (2000) based his theoretical deliberations on *systemic intervention* on the notion of boundary judgements and boundary critique. For Midgely (2000) "the boundary concept lies at the heart of systems thinking" (p. 128). Wherever the boundaries are placed in an analysis of a system of interest, they

> will make some things visible and others invisible. Systems thinking pursues the ideal of comprehensiveness, but knows that this is unattainable. However, reflection on the boundaries of knowledge at least enables us to consider options for inclusion and exclusion. It also reminds us that all understandings are incomplete (p. 129).

Midgely (2000) thus proposes the following definition of systemic intervention: "Systemic intervention is purposeful action by an agent to create change in relation to reflection on boundaries" (p. 129). He then derives three main methodological implications from this definition:

- Firstly, (intervening) agents need to reflect critically upon boundaries and make choices between (alternative) boundaries.
- Secondly, they need to make choices in between theories and methods to be used.
- Thirdly, "an adequate methodology for systemic intervention should be explicit about taking *action for improvement* (action for the better, which cannot, of course, be defined in absolutely objective manner)" (p. 130).

Therefore, *action for improvement* needs to be defined temporarily and locally, within the specific cultural-historic context of an intended systemic intervention. "The term 'improvement' is … general enough to have meaning in relation to almost any value system: it simply indicates the purposeful action of an agent to create a change for the better" (p. 131). An improvement is thus made when an intended change has been brought about or has been enabled through intervention.

3.7 Synthesis of methodological concerns and implications

3.7.1 The notion of action science revisited

Since I have indicated earlier in this text that my own conceptual and methodological orientation in educational R&D leans towards a conception of

"action science", it is probably useful to revisit and elaborate this notion a bit further, before I try to synthesise my overall analysis and attempt the formulation of a somewhat generic, methodological outline of systemic educational intervention research. The most elaborate and explicit formulation of educational research as "action science" was maybe published by Argyris et al. (1985) in the 1980s. Chris Argyris had already published a book titled "Intervention theory and method" in 1970 (1970) and continued to work with Donald Schön (Schoenfeld, 2006; Schön, 1983, 1987, 1991) and others on reflective practise and theory of action (with its notion of espoused theories vs. theories-in-use). Argyris et al. (1985) acknowledge that the idea of action science they put forward "is grounded in [their] practice as researchers, educators, and interventionists working within the theory of action approach" (p. 190). However, they also recognise that "it may well be that other research programs and theoretical approaches can provide alternative ways of conducting action science" (p. 190). While their approach is in large parts intimately linked to their particular theory of action and an attached research program, it nevertheless provides a useful outline of what distinguishes an action science approach to educational research conceptually and methodologically from approaches that follow the mainstream notion of science. It comes with relatively little surprise that Argyris et al. hold a rather critical view on what they call the "mainstream account of science" and its extension of experimental inquiry and covering-law model to social practise. According to this mainstream account, "pure" science is supposed to provide basic knowledge and grand theory, while applied scientists are expected to tailor these products to practical ends. However, Argyris et al. (1985) argue that "...theory that intends to contribute to practice should have features that differ from those of theory responsible only to the criteria of pure science..." (p. 19). In fact, they see a fundamental conflict between how traditional applied research frames problems and goes about its solutions, and how practitioners actually tend to do so. Essentially, applied researchers seem to follow a set of tacit rules grounded within the tradition of their community:

- ends should be regarded as "given" in the problem
- basic research in one's field of inquiry should be scanned for clues how to solve a problem. Clues that do not fit the applied purpose should be discarded.
- problem-solving strategies should be picked that fit within the existing constraints and norms of the community of practise of interest

"Such problem-solving logic is predicated on the assumption that it is neither necessary nor desirable to discriminate among ends" (Argyris, et al., 1985, p. 219). For practitioners, however,

> it is not sufficient to achieve a desired end. It is necessary to do so without unknowingly creating undesired ends. So practitioners must figure out not only how to achieve a given end but how to negotiate and renegotiate the often conflictual ends they discover in problematic situations... (p. 219).

This renders much of applied research and its products as rather impractical and hard to use in practise contexts. Action science is trying to address this issue conceptually and methodologically. "Action science intends to enact communities of inquiry in communities of social practice" (p. 78). Like mainstream science, action science tries to enact a community of inquiry that is composed of (action) scientists that communicate through research literature, debate, and so forth. "However, what is distinctive about action science is its mode of engagement with communities of social practice… much of the testing of knowledge claims will occur through engagement with client systems..." (p. 35). In addition, "...action science is centrally concerned with the practice of intervention..." (p. 35) to promote and support learning and intentional change within the client system (the system of concern) while contributing to general knowledge in the service of action. This particular orientation to knowledge creation carries some noteworthy implications. Action science intends to create knowledge…

- that will directly serve action. Thus, it must take capabilities (and limitations) of human beings in action contexts into account and emphasise alternative values (such as usability) for the evaluation of its products.
- that is relevant for the formation of purposes, and not only for the achievement of purposes (practical reasoning). It thus doesn't treat intentions and purposes as givens, but as an expression of a particular type of problem setting or situation framing.
- that takes account of normative issues and implications. Indeed, the forming of purposes implies a concern with value questions of the kind "what shall I (we) do?"

Argyris et al. summarise this orientation in the following words:

> As an agent who seeks to bring about some states of affairs rather than others, the action scientist will be advocating a normative position. A challenge that action science seeks to meet is that of making these kinds of practical knowledge explicit and testable... (p. 37).

Thus, action science needs to integrate and balance empirical claims (emphasised in mainstream science) and interpretive claims (emphasised in the hermeneutic tradition) with normative claims.

In general, action science takes the position that in the context of action, the quest for precision (so deeply ingrained in mainstream science) can become counterproductive.

> If the knowledge desired is highly precise, it is generally necessary for the actor to exert a high degree of unilateral control over the setting, and that includes other people. This is because precise knowledge is generated under conditions of unilateral control as, for example, in the experimental situation... (p. 42).

Instead, action science "intends to produce knowledge that is optimally incomplete and that can be filled in as the situation requires" (p. 78). However, action science (like mainstream science) tries to identify recurring patterns and

regularities. Such regularities are just not conceived as general, universal laws. Regularities "arise from the intended and unintended consequences of action by purposive agents" (p. 44) within communities of social practise. Action science is therefore rather concerned with pragmatic explanations "...concerned with practical issues of control and responsibility in particular contexts..." (p. 40) and practical forms of reasoning, than with the covering-law model of mainstream science.

Action science follows essentially the same principles for testing knowledge claims like mainstream science. This includes the notion of falsifiable theory, intersubjective agreement on observational data, explicit inferences, public, empirical testing within a community of inquiry. Naturally, the implementation of these principles differs in the context of action science and they are extended, as far as possible, to interpretive and normative claims. In general, knowledge claims in action science are grounded in the community of (social) practise it tries to serve. Empirical testing in action science, for example, is mainly carried out through intervention. In fact, Argyris et al. suggest that "intervention is the action science analogue of experimentation" (p. 64). Of course, in a practise context no agent has unilateral control over all the interacting variables and other actors. However, each intervention, as an action intended to bring about certain consequences, is based on causal theories; and the theories are tested by seeing if the consequences that actually occur are consistent with what the theory would predict..." (p. 64).

Action science justifies its normative position (of intentional change through intervention) through a critical analysis of the underlying principles and regularities of a client system, which remains the final judge of the validity of such critique. It explicitly shares the practical interest of the critical theory approach to social inquiry (as promoted and developed by the Frankfurter Schule). Action science thus follows an explicit emancipatory interest that is twofold. It offers critique of what is, in the light of what might (or should) be, thus stimulating self-reflection within client systems. In addition it is also concerned with helping clients (or client systems) to change themselves. In order to submit such normative claims to rational critique, so that practitioners or other researchers can reject them (just like they can reject empirical claims), action science needs to make these claims explicit.

3.7.1.1 Rules and methods of inquiry

Unfortunately, the rules and methods of inquiry that Argyris et al. (1985) have formulated are very much geared to their particular theory of action and research focus (on espoused theories and theories-in-use). On a more general level, they advocate the elicitation of data on "what individuals actually say and do as they interact, as well as data on what they are thinking and feeling at the time" (p. 239). On the basis of such data one can then try to (re-)construct the propositions, systems of meaning, and framing of situation that might have informed the action and interaction. Needless to say, that a multitude of data

gathering methods (such as interviews, vide-recordings, action experiments, and so forth) can be used in this regard. However, these methods will have to be selected and tuned according to the specific practical and theoretical interests that are formulated within a particular system of inquiry. The same holds true for data analysis, mapping, and visualisation. It seems obvious that the rationale for the use of such specific methods has to be derived from and related to the general orientation and knowledge interests of action science and the specificity of a compatible system of inquiry.

3.7.1.2 Traces of action science in other fields of R&D in human service

Though it is possible to (re-)interpret and describe numerous elements of the reviewed (interventionist) educational R&D approaches and their specific systems of inquiry within a framework of "action science", to my knowledge none of the proponents of these exemplary approaches have made an explicit attempt to do so. However, it seems noteworthy that research and development within other fields of human service have openly embraced the notion of action science as a more viable, alternative conceptualisation of their specific knowledge construction efforts and corresponding knowledge-constitutive interests. Organisational development and social work comes here to mind. In particular, scholars whose work is related to community psychology and social system design have started to acknowledge and theorise about the central role of action, intervention, and intended social change for their research and development practise.

Contemporary approaches in this realm often combine a general "action science" orientation with concepts and methods from system theory and systems thinking (see for example Foster-Fishman & Behrens, 2007; Foster-Fishman, et al., 2007; Hawe, et al., 2007; J. G. Kelly, 2007; Midgely & Ochoa-Arias, 2001; Midgley, 2000; Parsons, 2007; Seidman, 1988; Ulrich, 1987) that resemble the instruments and methods that I found promoted within the "system design approach in education (Banathy, 1988, 1991, 1992, 1994). These approaches make also explicit use of the (system) boundary concept, systematic boundary critique, and the notion of systemic intervention. Though educational practise is not the primary object of inquiry in these fields, they nevertheless deliver additional evidence for the general viability and appropriateness of an action science rationale ("logos") informing and orientating systemic interventionist research and development in areas of human service. On the basis of the re-occurring conceptual and methodic aspects that were highlighted throughout this overall analytical review and a general action science rationale, it becomes possible to formulate a more generic, methodological outline of systemic intervention research (and development) in education.

3.7.2 Methodological outline of systemic educational intervention research

The comparative analysis of a selected range of educational R&D approaches showed that a turn to educational practise as the general object of inquiry and intentional change indeed results in a general interventionist orientation and an overall research (and development) rationale that follows teleologic patterns of reasoning. The analysis further showed that the various research approaches (and their proponents) tend to address the methodological consequences of their overall rationale and orientation only partially and/or rather implicitly. While it was possible to trace elements of a "system of change" within each approach delineating the type and direction of change intended, its subject and object, and the main change levers and instruments, these aspects and their methodological consequences remain largely under-reflected within the respective literature. There seems to be a lack of a viable meta-language that would allow these various approaches to make their underlying interventionist rationale more explicit. Important references in this regard were taken from the literature on phronetic social science, systematic boundary critique and systemic intervention and the concrete conceptual and methodic proposals within these lines of thinking.

Furthermore, it was shown that all these aspects could be placed within a general framework of action science (Handlungswissenschaft) and its particular knowledge (creation) interests. Action Science starts from the normative position of bringing about intentional change through intervention (action for improvement). Intervention (into human systems) is its main empirical instrument. However, throughout the analysis and discussion above it has become clear that any notion of intentional change and improvement needs to be defined temporarily and locally, within the specific cultural-historic context of an intended systemic intervention. Thus, methodological outlines for systemic educational intervention research need to be "optimally incomplete" to allow for filling in such concrete contextual particularities. Making use of the boundary concept one can tentatively describe such an outline in the following way:

Delineating the (proto-)system of concern

First, one needs to delineate (map) the boundaries of the specific system (and possibly of its sub-systems) to be observed, analysed, and (potentially) to be intervened into. This includes the contextual constraints of the system of concern.

Enable a systematic boundary critique (in relation to system of concern)

These initial decisions and corresponding (value) judgements need to be scrutinised via a systematic boundary critique. While this ideally involves already (potential) stakeholders that are either involved or affected, this might

not always be possible from a resource or logistic perspective. However, from my perspective it should always be possible to make these initial boundary judgements at least transparent enough to invite critical review and debate within the wider community of practise (including educational practise and educational R&D practise alike). Altogether a systematic boundary critique should inform and enable the further refinement of the boundaries of the system of concern.

Analyse and model the system of concern

If possible (and if needed) one should analyse and model the system and its sub-systems structurally and functionally. The same holds true for the historical development of the structural and functional aspects of the system and its sub-systems. Naturally, the level, breadth, and detail of these modelling activities varies according to the knowledge-interests and the empirical and theoretical knowledge that is available and selected in respect to a specific system of concern as the object of inquiry and change. In some contexts the value-rational questions proposed by Flyvbjerg (2005) (Where are we going? Who gains and who loses, and by which mechanisms of power? Is this development desirable? What, if anything, should we do about it?) might guide an initial analysis that tries to determine if some type of intervention is at all desirable and feasible. In other contexts it might already be rather clear that a certain status quo is undesirable, problematic, conflictual, and so forth, and the analysis and modelling activities can focus on the structural and functional aspects of the current system and its historic development. This is often done to identify an initial set of potential instruments and promising levers for change. Depending on the level of empirical and theoretical knowledge already available in relation to the specific object of inquiry, either established theoretical constructs are selected, or new (proto-)constructs need to be formulated.

Formulate a system of change

Based on the initial delineation of the system of concern and the (various) modelling activities, one needs to develop and define a system of change (for improvement/betterment). From my perspective, systemic educational intervention research should primarily focus on transitional and (potentially) transformative change. In institutional contexts interventions would generally combine the following two change aspects:

1) primary intended change: the re-configuration (and disruption) of the activity system (or sub-systems) of concern, and/or the system's context. Such change is primarily planned.

2) secondary intended change: potential developmental transformations of overall system (or its sub-systems). Such change is primarily (potentially) emergent. Especially if one intervenes into complex (living) systems that tend to react in non-deterministic ways.

Furthermore, a system of change needs to outline the (predominantly collaborative) subject of change, the most promising change levers, and -instruments that are supposed to be used for carrying out the intervention.

Outline potential side-effects and system's reactions
Though intervening into complex (living) systems doesn't really allow for a prediction of its concrete reactions, it is possible and useful to outline and deliberate on possible and potential (unintended) side-effects, such as negative reactions or resistance of the overall system (or sub-systems) to the intervention. All too often such reactions are prematurely interpreted as a sign of failure of the intervention, while they actually indicate that the intervention was successful in respect to its primary change intent (of disruption and re-configuration).

Enable a systematic boundary critique (in relation to system of change)
In relation to the formulated system of change and the deliberation of potential side-effects one should enable another systematic boundary critique of the implicit and explicit (value) judgements.

Implementation of (first cycle of) intervention
While the (first cycle of) intervention is carried out one needs to observe and document "desired" system's activity by using a multi-methods approach. This is done with a focus on evidence for primary and secondary change (as defined in the system of change). In addition, "unwanted" system's activity (side-effects & resistance) is also observed and documented.

Review, adjustments, and the formation of theoretical constructs
Based on the observational data from the (first cycle of) implementation the overall intervention and its (change) methods & instruments get reviewed and adjusted if necessary. If needed, also the system boundaries get adjusted and additional structural & functional modelling activities are carried out. These should allow for different types of causality. Also the system of change can get adjusted, in the light of the empirical data gained from the first cycle of intervention. This is also the stage where existing theoretical constructs might need to get adapted, or new constructs might be formulated, to better represent the system of change and to organise the observational data at hand.

Enable a systematic boundary critique (in relation to the adjusted boundary judgements)
Depending on the scale and scope of the adjustments another round of systematic boundary critique might become necessary and helpful. It might also be easier to identify and engage additional stakeholders that ought to be involved or that are affected once the first cycle of intervention has been carried out. Needless to say that such systematic boundary critique could trigger additional adjustments of the various boundary judgements that went

into the overall intervention design.

Implementation of (next cycle of) intervention
If possible, systemic educational intervention research follows an iterative, cyclical approach, as it is also promoted within design-based research. This should lead to a critical review and gradual refinement of the necessary boundary judgements and their corresponding value claims. It should also result in the creation of increasingly robust heuristic-instrumental knowledge on how to bring about specific, intended change under particular contextual constraints.

Formulate "optimally incomplete" orientation knowledge for practise
The empirical and conceptual insights that are gained throughout various cycles of intervention should finally be condensed into knowledge artefacts that are optimally incomplete and that directly serve educational practise. However, heuristic-instrumental aspects need to be combined with aspects that support the critical deliberation and formation of purposes (for intentional change) in educational practise.

This rather generic methodological outline of systemic educational intervention research undeniably requires the selection and application of specific data gathering and -processing methods at various stages. However, I share the view that we can (and should) acknowledge a general methodical and theoretical pluralism in relation to systemic intervention. Midgley (2000) suggests, for example, "that theories should be seen as more or less useful in terms of the purposes of intervention being pursued" (p. 168). The same holds true for methods. Methods of various kinds can be drawn into systemic educational intervention research as long as they can be (re-)interpreted through the overall rationale (logos) of the action scientific (handlungswissenschaftliche) perspective on intervention for intentional change. This brings me back to the Hakkarainen's notion that "in human sciences, method, so to speak, creates the phenomenon (research object) of investigation" (Hakkarainen, 2009, p. 225). While this is certainly too often the case, I believe that instead the use of specific methods should be justified within a particular rationale of research. That a turn to educational practise and its intentional change (improvement) indeed requires a particular rationale of research, I have tried to demonstrate throughout my comparative analysis and discussion of a range of contemporary, educational R&D approaches and some additional methodological proposals from the wider realm of social science. The above methodological outline of, what I call, *systemic educational intervention research* tries to capture the key aspects of an interventionist, action scientific (handlungswissenschaftliche) rationale of research that provides a framework for selecting, combining, and justifying the use of methods in the service of bringing about intentional change.

4 Overview of the publication portfolio

4.1 Publication 1

Fiedler, S. (2003). Personal webpublishing as a reflective conversational tool for self-organized learning. In T. N. Burg (Ed.), *BlogTalks: European Conference on Weblogs* (pp. 190-216). Wien: Cultural Research - Zentrum für wissenschaftliche Forschung und Dienstleistung.

Purpose

The article argued for a decisive shift of attention towards (adult) learning activity as an object of inquiry and intentional change in the light of the ongoing digital transformation and massive expansion of the publicly available mind-pool (of knowledge and its materialised artefacts). Furthermore, it demonstrated how core concepts and distinctions that had been developed within the self-organised/conversational learning approach (Harri-Augstein & Cameron-Webb, 1996; Harri-Augstein & Thomas, 1991; L. Thomas & Harri-Augstein, 1985) could be used to (re-)interpret emerging webpublishing practises as an instrument for enhancing, developing and qualitatively changing, individual (and collective) learning activity. In addition, it provided the description of a proto-typical configuration of networked webpublishing tools and services that were used in an early intervention and implementation project in higher education and called for more studies of this kind.

Methods used

The article was based on an extensive review of conceptual and empirical work on how to support the development of (increasingly emancipated and self-organised) learning activity, and earlier conceptual and empirical work that I had conducted at the University of Georgia, USA. This was combined with a review and analysis of the emerging webpublishing practises that I had been engaged in and experimented with. The synthesis was achieved through reflective-analytical work and the design of a collaborative, intervention project at Penn State University.

Findings and results

It was shown that concepts, distinctions, and tools that had been developed in the context of the self-organised/conversational learning approach (Harri-Augstein & Cameron-Webb, 1996; Harri-Augstein & Thomas, 1991; L. Thomas & Harri-Augstein, 1985, 2001) in the 1980s and 1990s, offered a viable framework for (re-)interpreting emerging, personal webpublishing practises as reflective, conversational instruments that could support the development of (self-organised) individual (and collective) learning activity. Confronted with the phenomena of a rapidly expanding pool of materialised, public knowledge in form of artefacts, as records of human activity, the conversational (learning) framework offers some viable concepts and distinctions. While the "outer conversation" stands for the exchange with external resources (artefacts, people, etc.), the "inner conversation" refers to the inner exchange, or reflection. Looking for "evidence for learning and

change" one can either draw from observation of action and behaviour, or items of experience. The "externalisation" or "materialisation" of records of action or items of experience support the inner and outer conversation in relation to such material. The outcomes of reflection, in turn, can be externalised again, thus supporting additional conversational loops and meaning making. To turn one's own learning activity (or underlying processes, dispositions, etc.) into an object of inquiry, reflection, and potential change, most people lack the instruments, such as conceptual-linguistic, or structured, procedural tools that could guide the inner and outer conversation. In addition, many people acquire disabling beliefs, or other dispositions, through a personal history of developing learning activity almost exclusively coupled with teaching activity in formal educational settings. Therefore, turning (one's own) learning activity into an object of inquiry and change is greatly supported by the use of rather generic and content-independent, conversational tools (such as the use of personal learning contracts). These tools should carry the potential to be used as self-coaching devices and to be (potentially) internalised over-time. They should enable individuals to develop their own instruments (language, artefacts, procedures, etc.) for modelling and developing their learning activity over time.

The personal webpublishing practises that were emerging at that time (weblog authoring in particular) could indeed be conceptualised and used as such a generic, conversational tool, supporting the actions and operations described within the literature as necessary for supporting the intended developmental move towards more emancipated (self-organised) learning activity. Another result of this analysis and deliberation was the description of the structural and procedural components of a first intervention and implementation project within higher education.

Historical context and contribution to overall inquiry

The article was published after a period of intensive exploration (2000-2002) and experimentation of the (individual and collaborative) personal webpublishing practises that were emerging at that time. It draws significantly from earlier conceptual and empirical work on supporting the development of (self-organised) learning activity (see for example S. Fiedler, 2001) and marked the beginning of a series of small-scale intervention projects in higher education that were conducted at various Universities from 2002 to 2006. Its main contribution to the overall study was the conceptual adaptation and (re-)interpretation of personal webpublishing practises as an (potential) instrument for the re-mediation and development of individual (and collective) learning activity. Furthermore, it described a prototypical "seed" configuration of networked tools, services, roles, and procedures, to intervene accordingly into existing teaching and studying practises in higher education. It represents an early, but somewhat incomplete, attempt to delineate a (proto-)system of inquiry and change, and to describe potential levers and instruments for

change.

4.2 Publication 2

Väljataga, T., & Fiedler, S. (2009). Supporting students to self-direct intentional learning projects with social media. *Journal of Educational Technology and Society, 12*(3), 58-69.

Purpose

The article reports on an intervention that was carried out at Tallinn University, Estonia. This intervention was built around the redesign of a Master's level course. It focused on the systematic interruption of common teaching and studying practises to foster the emancipation, development and re-instrumentation of individual, and collective, learning activity with social media tools and services. Apart from gaining additional observational data on the effectiveness and feasibility of the overall intervention approach (proto-typed within earlier intervention projects), the specific research interest of this study was the documentation and analysis of experiential data from the participants. The main focus was put on what was perceived as challenges, advantages and disadvantages of taking responsibility for one's own learning activity (via self-directing a specific learning project), the instrumental role of personal learning contracts, and the instrumental role of social media.

Methods used

For the specific analytical focus of this study, a direct elicitation method was used for data gathering. Experiential essays were combined with open-ended questionnaires to gather statements from all 26 participants on their expectations regarding the overall educational episode in general, and the role of facilitators in particular. From the same data sources the following statements were gathered: statements on experienced challenges and difficulties; advantages and disadvantages of formulating and directing a personal learning project, the instrumental role of the personal learning contract procedure; the instrumental role of social media for carrying out their learning projects; and their previous and prospective use of networked tools and services either for study or work.

For the qualitative analysis of the participants' essays followed recommendations by Miles and Huberman (1994). The analysis was supported by the use of the HyperRESEARCH software application. In a first step, the essays were coded according to a-priori-codes derived from the specific research questions that guided the study. While working with the data, these categories were gradually elaborated and expanded according to the emergence of sub-themes. The data from the paper-based questionnaire was analysed qualitatively, too. The analysis followed a top-down approach in which the data was also categorised according to a-priori-codes based on the research questions. The data analysis for the participants' essays and questionnaires was initially done separately, and only merged after the coding system had started

to consolidate.

Findings and results

The challenges that were reported by the participants could be categorised as either related to the use of new terminology (concepts), the use of the personal learning contract procedure as an instrument, the collaborative work on assignments and tasks, and the use of networked tools and services as instruments for the execution of individual and collective learning activity. Participants reported rather differentiated views on the perceived advantages and disadvantages of formulating and directing personal learning projects, thus displaying an ambivalent attitude towards the change intention of developing increasingly emancipated (and self-organised) learning activity. On the other hand, participants predominantly evaluated the personal learning contract procedure as a useful instrument in this regard. They also generally (re-)confirmed the instrumental role that rather generic, social media tools and services can play for carrying out and directing personal learning projects in a distributed, networked environment.

Historical context and contribution to overall inquiry

This article was based on the second, intervention study carried out at Tallinn University. This specific intervention took place in late 2007 and was meant to apply and cross-validate the effectiveness and feasibility of conceptual ideas developed in the context of the iCamp project (and its international intervention studies), within a smaller and more local setting.

The study delivered valuable insights into what challenges participants experienced while confronted with this type of intervention. Furthermore, it documented how they perceived the instruments for change (formulation and direction of a personal learning project; the use of a personal learning contract procedure as a conversational, (self-)coaching device; and the use of social media tools and services) that had been selected. It informed the further conceptual development and consolidation that was, for example, addressed later in publication 3, and the design and implementation of the third, more complex, international intervention study within the iCamp project.

4.3 Publication 3

Fiedler, S., & Pata, K. (2009). Distributed learning environments and social software: In search for a framework of design. In S. Hatzipanagos & S. Warburton (Eds.), *Handbook of Research on Social Software and Developing Community Ontologies* (pp. 145-158). Hershey: IGI Global.

Purpose

This publication tried to consolidate the conceptual development that had taken place in the context of the international iCamp project. The objectives and focus of iCamp had required a turn towards developing collective learning activity as an equally important object of change. It thus introduced the notion

of distributed learning environments (in relation to the concept of personal learning environments), and emphasised the need to conversationally ground the perceived possibilities for action (affordances) within such distributed environments and in relation to the instruments they provide. In general, the publication also intended to promote a shift from the notion of learning environment "design" towards a more interventionist orientation with a focus on supporting non-deterministic, developmental change of learning activity.

Methods used

The publication is based on analytical, reflective work that integrates a literature-review on cultural-historical activity theory and its use in educational R&D, and the concept of "affordance", with previous conceptual work on designing interventions for the development of individual and collective learning activity and its specific environments.

Findings and results

Among other aspects, the publication highlighted the widespread, problematic interpretation of the concept of personal learning environments as a mere technical toolset, and its limited usefulness in the context of collective learning activity and its expression through interpersonal learning projects and the formation of, so called, distributed learning environments. It also attested some general compatibility of our deliberations with the notion of activity systems promoted by the cultural-historical activity theory of the Helsinki school of thought. However, our predominant concern with the formation of (previously not existing) systems of collective learning activity, led to the introduction of the concept of "affordance", as a perceived possibility for action, to emphasise the variability of individual's perception of what instruments should be drawn into their collective activity. It was suggested that not only the objects of collective (learning) activity, the distribution of "work", some rules for engagement and interaction, and so forth, need to be conversationally grounded, but also the instruments that are drawn into the activity and become part of the distributed learning environments that are gradually formed by the collaborating actors. While we acknowledged certain drawbacks and weaknesses (such as missing interoperability) of the existing landscape of loosely, coupled, networked tools, we suggested that these tools already offered a wide, and growing, array of general instrumentation options for the execution of collective (learning) activity.

Historical context and contribution to overall inquiry

This article was mainly written in 2007/2008. It tried to consolidate some insights, conceptual developments, and controversial discussions, based on the international intervention studies carried out within the iCamp project and the local intervention projects that had been conducted at Tallinn University. The publication somewhat reflects an expansion of the object of inquiry and change. While the earlier intervention work had predominantly focused on developing individual learning activity, in the context of the iCamp project

developing collective learning activity had gained importance. This was partly due to the specific demands that the international, European Commission funded, iCamp project imposed, but also reflected the general dissemination, growing acceptance, and ongoing development of the available landscape of networked tools and services, and its growing array of instrumentation options for collaborative production. Though this publication already tries to prepare for a turn to an explicit interventionist orientation and methodology, it displays the legacy of the notion of "learning environment design" that dominated the discourse within the context of the iCamp project in its international and interdisciplinary consortium of researchers at the time. The intended shift to such an interventionist R&D approach remained controversial through the run-time of iCamp and was easier to accomplish in the Tallinn based small-scale studies. However, this publication marked an important, interim step in the conceptual development of the overall inquiry.

4.4 Publication 4

Fiedler, S. H. D. (submitted). *Emancipating learning activity in the light of the digital transformation.*

Purpose

This publication reviewed how different strands of Cultural Historical Activity Theory (CHAT) have conceptualised the formation and development of learning activity (Lerntätigkeit). Furthermore, it argued for turning learning activity into an explicit object of inquiry and intentional change (through intervention) in higher education, thus focusing on its gradual emancipation from teaching and schooling, and its digital-networked re-instrumentation. Its main purpose, however, was the presentation and interpretation of empirical insights that were gained in the context of an international systemic intervention study in European higher education. The presentation focuses on the analysis of mediated (inter-)actions within a particular case.

Methods used

The publication was partially based on the comparative analysis of different strands of research on learning activity within the framework of Cultural Historical Activity Theory (CHAT). The presentation of empirical insights was based on an extensive, qualitative content analysis of productive and conversational (inter-)actions mediated by a range of digital-networked tools. The data set comprised of email exchanges, posts published on personal weblogs of the participants, posts on their group (work) weblog, synchronous text-chat protocols from synchronous group sessions, traces within a (group) wiki, and transcripts from interviews with participants. First-level coding was initially done separately by two researchers who followed a bottom-up approach looking for emerging patterns in the overall data. The two coding schemes were then reviewed, discussed and merged. In another round of data review and coding the overall scheme was revised and elaborated by some core

concepts derived from the theoretical framework of CHAT. The reduced and coded data was then compressed into a selection of quotes that were further categorised. This material was then used for further interpretation and validity checks.

Findings and results

The paper highlighted that conceptual and empirical work on learning activity had either mainly focused on its (initial) formation within the context of formal schooling, or the expansive transformations of activity systems (of work). Neither approach seemingly addressed the (further) development of more emancipated and digitally re-instrumented forms of learning activity in the context of higher education that had been made the focus of our interventionist research. The analysis of observational data that was gathered within the context of an international intervention study offered considerable evidence that the applied strategies and instruments indeed resulted in a considerable re-configuration of the patterns of control and responsibility and the gradual formation of adhoc activity systems (of individual|collective learning) among the participants. These adhoc activity systems were characterised by their considerable amount of time and effort that was spend on the collective formation of a shared object and a vision of product, and the exploration and selection of digital-networked instruments for the mediation of their productive and conversational (inter-)actions. In addition, participants engaged in the experimental and systematic expansion of community boundaries. Only after the establishment of a shared (proto-?)object (of their learning activity) and an initial vision of product the agents of such systems engaged in the division of tasks and labour, and the regulation of their cooperation and collaboration. It appeared that the conceptual instruments (of intervention) that we had applied (the formulation of personal|inter-personal learning projects, the use of a personal|inter-personal learning contract procedure, and the modelling of resources as personal|distributed learning environments) effectively supported the generative and projective character of this type of individual|collective learning activity and its development.

Historical context and contribution to overall inquiry

This article was based on a re-analysis and re-interpretation of data that had been gathered in the context of the third and final international intervention study carried out from March to June 2008 within the iCamp project. It helped to re-examine and validate some of the conceptual and methodological developments that had been taking place through the course of the overall inquiry. Furthermore, it presented additional empirical evidence for the effectiveness of the intervention approach and its instruments in regard to our intentional change perspective.

4.5 Publication 5

Fiedler, S., & Väljataga, T. (2010). Interventions for second-order change in higher education: Challenges and barriers. *Electronic Journal of e-Learning, 8*(2), 85-92.

Purpose

The main purpose of this publication was the examination of challenges, tensions and barriers experienced by the researchers/interventionists while implementing a systemic intervention project in an international, inter-institutional setting in higher education.

Methods used

The publication was based on an extensive, qualitative content analysis of several sources of data that had been elicited from the main groups of actors (institutional representatives, facilitators and students) within the boundaries of the system of interest. It comprised of online interviews with 9 facilitators, records of video-audio meetings of facilitators and researchers/ interventionists, email exchanges, posts authored by the facilitators that were either published on their personal weblogs or within the Web-based workspace shared by all facilitators, transcripts form interviews with participating students, posts in their personal weblogs, and digital traces in various web-based tools and services that had been used during the intervention. The data was analysed from an interventionist perspective. The coding was initially done separately by two researchers who applied a set of a-priori codes that were gradually elaborated when sub-themes emerged (Miles & Huberman, 1994). When the coding system started to consolidate the analysis was merged and continued collaboratively.

Findings and results

The analysis of the data from institutional representatives, facilitators, and students highlighted a wide variety of challenging side-effects and resistive reactions within the overall system of concern. While there was ample evidence that the selected levers and instruments for change had indeed effectively disrupted former practise, the data also showed reactions of resistance and discontent from various actors in relation to the type and object of change that had been driving the intervention effort. Partially this could be attributed to contradicting demands within the overall (local) activity systems of work and study. However, there was also strong indication that personal, normative aspects (such as beliefs, orientations, attitudes, and so forth) played an important role in producing the variability of individual reactions to the intervention and its selected instruments for change. Altogether, a number of re-occurring challenges and resistive reactions could be identified that had already been observed in the preceding intervention studies. The variability of the documented resistive reactions was interpreted as (yet) another indication that interventions into human systems of activity cannot (and should not) be

modelled with clear, cause-and-effect relationships, and thus could not be determined on an individual and collective level. Instead, it was suggested that the mutual observations and expectations of all involved actors need to be monitored, interpreted, and negotiated while an intervention is carried out, to allow the interventionist to "improvise" accordingly within the boundaries of the system of inquiry and change driving the overall effort.

Historical context and contribution to overall inquiry

This article also focused on the analysis of empirical data that was gathered within the third and final, international, intervention study carried out from March to June 2008 as part of the iCamp project. The effort to analyse and document challenging side-effects and resistive reactions that seemingly re-occurred in the context of these type of interventions, allowed for the formulation of such (potential) effects within other intervention projects of this kind. Furthermore, it highlighted the need for making boundary judgements, underlying the system of inquiry and change, as explicit and transparent as possible to allow for (elements of) systematic boundary critique before, during, and after the actual intervention. Both aspects were finally integrated in an emerging methodological outline.

4.6 Publication 6

Fiedler, S. H. D., & Väljataga, T. (2011). Personal learning environments: Concept or technology? *International Journal of Virtual and Personal Learning Environments, 2*(4), 1-11.

Purpose

The article responded to the growing discourse around the concept of Personal Learning Environments that had initially emerged as a counter-concept against the domination of centrally hosted solutions for supporting predominantly the existing teaching and studying practises in higher education. The article scrutinised the available literature base on the concept of Personal Learning Environments. Furthermore, it argued for an explicit de-coupling of the notion of Personal Learning Environments from the current state of development of the digital realm. Instead, it proposed to understand Personal Learning Environments in connection with the notion of (emancipating) learning activity. It expressed the normative position that educational intervention should focus on enabling individuals to model and develop their learning activity and to shape specific (personal learning) environments accordingly.

Methods used

The main method used for this article was a comparative meta-analysis of a significant body of literature on the topic of Personal Learning Environments. The identification and collection of relevant literature was a collaborative effort with the co-author of the article, while the categorisation, interpretation, and critique of the material was mainly the work of the main author.

Findings and results

The article attested a wide array of interpretations and conceptualisations of the notion of Personal Learning Environments within the scholarly discourse. However, two main strands of interpretation and conceptualisation could be identified. The first strand treated Personal Learning Environments primarily as a technological system or tool collection, while the second strand positioned Personal Learning Environments rather as a concept or approach. It became apparent that only a minority of scholars represented the latter strand while the technological conceptualisation of Personal Learning Environments started to dominate the discourse. Furthermore, it was argued that very little effort had been made to anchor the concept of Personal Learning Environments in an explicit notion of "personal learning" and human development and change, and that the proposed use of emerging, digital instrumentation options often repeated old patterns of practise within the new medium. As a result of the analysis and deliberation an explicit normative position was formulated, focusing educational intervention work on the development of (emancipated) learning activity and the active shaping of specific (personal learning) environments by individuals.

Historical context and contribution to overall inquiry

Though this article is only published in 2011, the review of literature on Personal Learning Environments had been started already in 2008 and was gradually extended into a rather comprehensive meta-analysis of the available literature in early 2010. Its main contribution to the overall study was the conceptual de-coupling of the notion of Personal Learning Environments from the current, and continuously expanding, array of digital instrumentation options and its explicit connection to the notion of learning activity and its further development.

5 Implications and directions

5.1 Revisiting the questions and challenges that guided the overall inquiry

What cultural-historical developments make learning activity an increasingly important object of inquiry and change?

This thesis summarised some important lines of argumentation for turning learning activity (Lerntätigkeit) into an explicit object of inquiry and change in educational practise and educational research practise in higher education (see Part 2). Initially, the starting point for these critical deliberations was the emerging expansion of digital networked technologies and their looming impact on a wide range of human activities and activity systems in general, and learning activity (as the specific cultural-historical form of intentional learning) in particular. Since the inception of the inquiry underlying this thesis, the unfolding digital transformation and its observable impact on human (learning) activity has rather accelerated. That development, however, has not rendered the observations and arguments presented in this thesis obsolete. To the contrary, recent developments such as the exponential expansion of social media, social networking, and the proliferation of mobile devices, continue to aggravate the attested gap between the re-instrumentation and emancipation of learning activity "in the wild" on one side, and the type of re-instrumentation of *schooling* that is still dominating contemporary higher education. The proposed argumentation for a decisive shift of attention to the intentional emancipation and further development of learning activity (as an important cultural instrument for human (self-)production) has actually gained viability and validity in recent years.

This shift also marks a turn away from the still dominating focus on adaptation, appropriation and acquisition, to exploration, formation, sense making, and intentional change instead. In a very recent publication Thomas and Seely Brown (2011) emphasise that "we can no longer count on being taught or trained to handle each new change in our tools, the media, or the ways we communicate on a case-by-case basis" (p. 43). Thus, educational practise needs to develop and cultivate new forms of digitally mediated learning activity that actually "embrace change" (D. Thomas & Seely Brown, 2011) through networked individual|collective (self-)production. These emerging forms of networked individual|collective learning activity need to be regarded as historically new formations that will not necessarily supersede older formations, such as the activity system of schooling. It is most likely that they will co-exist with these older formations for the foreseeable future (Erdmann & Rückriem, 2010).

The critical, analytical perspective that has guided the overall inquiry and the publications underlying this thesis has produced a set of deliberations and descriptions that mainly served its practical-phronetic (value-rational aspects of means and ends) and developmental-emancipatory (deliberation of issues of power, self-determination, and growth) knowledge-constituting interests. The

thesis provides a considerably strong analysis, argumentation, and normative claim on why the development of learning activity should be turned into an object of individual|collective inquiry and intentional change in higher education, and why the current state of affairs in higher education actually impedes such a development.

How can educational R&D practise methodologically pursue such an object of inquiry and change, within the ongoing digital transformation?
Part 3 of this thesis was dedicated to an in-depth exploration of what type of methodological rationale should actually be applied to an object of inquiry (developing learning activity) that is at the same time conceptualised as an object of intentional (potentially transformative and emergent) change within the ongoing digital transformation. To this end a range of selected educational R&D approaches were analysed and compared that all carried a more or less explicit notion of intentional change (of educational practise) within their systems of inquiry, and that had been influential in different phases of the conceptual and empirical intervention work carried out in the context of the overall inquiry. Two of the analysed approaches (the expansive developmental research approach and the self-organised/conversational learning approach) were identified as sharing an explicit rationale for transformative, emergent (not pre-defined) change, an explicit developmental-emancipatory interest, and the use of systemic concepts. However, it was also shown that practical-phronetic (value related) issues and interests were not really addressed methodically within these approaches, thus not providing any means to critically reflect upon their particular systemic boundary judgements and activity models.

The notion of critical, phronetic social science with its focus on value-rational deliberations was presented as a viable starting point for addressing value-rational contents of practise and intervention. Embedding the core ideas of phronesis in a general framework of action science (Handlungswissenschaft) and complementing them by the notion of systematic boundary critique and systemic intervention, it becomes possible to formulate the methodological outline of a critical systemic intervention research approach. This type of approach offers a methodological rationale that focuses on the formulation and the critical deliberation of an explicit system of change (for improvement/betterment).

It is important to note that the various intervention studies that were carried out in the context of the overall inquiry only partially reflect the deliberations that went into the methodological outline presented in this thesis. This is predominantly the product of the comparative and reflective (re-)evaluation of how the inquiry had actually developed over time methodologically, how other educational R&D approaches had addressed the notion of intentional change, how the inevitable value-rational issues could be systematically addressed, and how all this could be tentatively synthesised and

abstracted. I maintain the view that the conceptual and empirical work that was actually carried out within the overall inquiry underlying this thesis could be described and (re-)interpreted within this rather generic methodological outline.

The attempt to engage in a rather comprehensive, retrospective, methodological reflection as part of this thesis was largely driven by an heuristic-instrumental knowledge interest for the formulation of "optimally incomplete" guidelines for educational R&D practise that shares the practical-phronetic (value related) and developmental-emancipatory (power related) orientations that had been driving the overall inquiry. While the feasibility of particular components and sequences of the outlined critical systemic intervention research approach were validated within different phases of the overall inquiry, it would certainly benefit from further cycles of application, review, and elaboration in a range of contexts. Altogether, the approach seems to provide an adequate rationale for dealing with objects of inquiry and intentional change (of human practise) in a cultural-historical period that is characterised by a co-evolutionary drift of continuously expanding, digital networked technologies on one side, and emerging human practises and dispositions on the other.

How can we effectively intervene into existing practise in higher education to support the development of (increasingly emancipated) learning activity in the light of the ongoing digital transformation?

Given the nature of the unfolding digital transformation it is obvious that the above guiding question can only be answered tentatively, temporarily and contextually bounded. Part 2 of this thesis contains a condensed summary of the change levers and instruments that had been identified and developed within the intervention studies that were carried out in the context of the overall inquiry. The overview of the publication portfolio in Part 4 and the original publications provide more detailed and contextualised descriptions of these levers and instruments for change.

Altogether it can be attested that the combination of a small set of conceptual instruments with a rather minimalist "seed" configuration of open, loosely-coupled, digital networked instruments, has been used effectively to fundamentally alter the dominating patterns of control and responsibility within the particular intervention contexts that were created as part of the overall inquiry. This intervention approach also made the experimental development of more networked and emancipated forms of individual|collective learning activity possible without rendering the overall system of concern dysfunctional. The viability and robustness of this approach could be basically validated in all of the intervention studies that were part of the overall inquiry. Its key conceptual and procedural instruments were: the establishment of personal (or inter-personal) learning projects; the

conversational-reflective formulation, negotiation, monitoring, and evaluation, of such learning projects with the help of a personal (or inter-personal) learning contract procedure; and the modelling of resources (and their digital representation and mediation) as a personal (or inter-personal/distributed) learning environment. Depending on the specific constraints of a given intervention context, these conceptual instruments might require some adaptation or elaboration. The core idea is to use a small set of such intermediate, conceptual and procedural instruments to support the necessary transition from teacher organised instruction and interaction to a concrete expression of independent, subject-driven learning activity (Lerntätigkeit) within the contextual constraints of formal higher education. Any instrument that serves that interventionist purpose could be meaningfully integrated in principle. Nevertheless, I want to formulate the instrumental-heuristic knowledge claim that the combination of the conceptual instruments that were adapted and validated in the context of the overall study indeed provide some means to effectively intervene into existing practise in higher education to support the development of (increasingly emancipated) networked learning activity.

In the light of the ongoing transformation, digital networked instruments (tools and services) need to be considered and treated as transient elements within critical systemic intervention research in higher education. The "seed" configurations of open, networked tools and services that we used in the context of our interventions would most likely look already slightly different now than they looked in 2006 or 2008, and they will most certainly look different in two or three years from now. The essential aspect here is a decisive move to this type of loosely-coupled, digital networked instruments that allow for individual|collective ownership, control, (co-)production, and re-use in other contexts and for other purposes. The instrumental efficiency of the mainstream (re-)instrumentation of teaching and studying practises in higher education, needs to be scrutinised, critiqued, and contrasted with practical-phronetic and developmental-emancipatory interests. It seems fair to project, for example, that self-determination and personal growth in and beyond the digital transformation will increasingly be limited (or enabled) by the competent selection and use of digital networked instruments that can be freely combined, owned, and adapted for mediating the production and self-production of individual|collective subjects. Since the range of digital instrumentation options is continuously expanding and currently shows no signs of an imminent slow-down or consolidation, individual and collective exploration and experimentation of this realm needs to be systematically incorporated into higher education practise. That such experimental practise regularly leads to observable "performance drops" if measured exclusively from the perspective of the dominant activity system of schooling with its focus of time-efficiency, predictable outcomes, and appropriation of pre-defined objects (of teaching and study) needs to be accounted for in any

context where these digital networked instruments and their exploration are part of an overall intervention rationale of the kind that is promoted in this thesis.

Publication 5 addressed some of the challenging side-effects that are regularly triggered by intervening accordingly into existing practises in higher education and discussed resistive reactions from particular groups of actors within the system of concern as they were experienced from an interventionist perspective. Unfortunately, this line of research could not be extended much further for resource economic reasons at the time. However, it represents an interesting aspect of critical systemic intervention research. Retrospectively, it appears that resistive reactions were often connected to value-rational conflicts among actors and the incompatibility or intransparency of boundary judgements and their personal or collective histories. The experienced incapability of the iCamp research consortium, for example, to work constructively with these type of "side-effects" of intervention and to reach a common interpretation of their meaning within our proposed system of inquiry and change, was an important source for the methodological reflection in Part 2 of the thesis and the final formulation of a critical systemic intervention approach to educational R&D. The explicit formulation and communication of a system of change (its type, subject, levers & instruments, object, and direction) and potential side-effects of an intended intervention turned out to be key elements for the formation of a collective subject of inquiry and change that successfully integrates the various groups of actors (students, facilitators, researchers, administrators, and so forth) that are necessary to make transformational and emergent change possible.

The interventionist studies that are presented within the publication portfolio of this thesis suffered from some considerable weaknesses in this regard. These shortcomings were largely due to the lack of a common methodological rationale and terminology for carrying out critical systemic intervention research. For example, the collective critique of boundary judgements in the early stages of the iCamp project was largely confined to the participating researchers and facilitators, while students were only gradually introduced to its overall system of inquiry and change. Publication 4 and 6 provide some exemplary evidence that value-rational conflicts (of what should or should not be done in higher education) limited the effectiveness of our intervention and change intention for particular participants.

In general, however, resistive reactions to interventions need to be treated with respect. They require conversational-reflective attempts of shared sense-making and interpretation and need to be connected to developmental-emancipatory knowledge interests (related to issues of power, self-determination, and growth). Change intentions do not have to be shared and adult individuals need to be able to opt out without major repercussions. In fact, in higher education this might sometimes be meaningfully interpreted as an indication of the effectiveness of a particular intervention. In the specific

context of the inquiry that underlies this thesis we obviously encountered participants who basically insisted on remaining within the familiar system of *schooling* and who rejected any engagement into the collective experimental development of more emancipated forms of learning activity within the confines of higher education.

5.2 Implications for educational practise and educational research practise

The work being presented in this thesis suggests a variety of implications for educational practise and educational research practise in higher education. What it generally suggests is a decisive shift of attention away from incremental improvements of the existing activity system of *schooling* with its focus on the acquisition and appropriation of pre-defined knowledge and skills, and its underlying notion of learning activity being inevitably coupled to teaching activity. Instead, it promotes an educational practise that conceptualises learning activity as an explicit object of (individual|collective) inquiry and intentional (developmental) change in higher education. It considers emancipated and (conceptually and digitally) re-instrumented learning activity as a means for (self-)production and self-determination in and beyond the digital transformation.

5.2.1 Curricular reform and redesign in higher education

The practical intervention studies that made up the core of the empirical work of the overall inquiry were all purposefully carried out on the post-graduate level (graduate school) within various programmes of study and various institutional contexts. Making learning activity an explicit object of collective inquiry and development is not promoted here as a general model for all levels of educational practise in higher education. We always saw our educational interventions rather as an attempt to break away from the well-established learning and teaching activity that is driven by the appropriation of pre-defined knowledge and that still dominates the early stages of higher learning. We wanted to bring about more emancipated forms of knowledge (and self-) production through the experimental engagement with digitally mediated production processes that require rather different types of agency, cooperation and collaboration.

On the post-graduate level, however, it is certainly possible and feasible to expand the core curriculum with a preferably non-compulsory offer of "courses" (or rather time-bound educational episodes) that only delineate a common theme, problem area, or set of challenges, thus allowing for the proposed shift of attention to an experimental exploration and development of new forms of networked learning activity, the gradual formation of shared objects (of such activity), and its largely self-determined instrumentation.

That this shift cannot be achieved unaided and requires some procedural and structural support was a stable observation throughout all intervention

studies that were part of the overall inquiry. However, the instruments that were validated within the intervention studies can be readily applied (or easily adapted) by educational practitioners who share the general developmental intention and interests that are promoted in this thesis. The modelling of personal|inter-personal learning projects (through reflective-conversational practises and tools) as a concrete, episodical manifestation of individual|collective learning activity provides an important and powerful entry point for the type of educational practise that we envision. The (self-)modelling and systematic expansion of personal|distributed learning environments provides a conceptual and practical supplement that can be combined with a (initially guided) (self-)exploration of digital instruments for mediating conversational and productive actions.

In addition, the continuously expanding scope and depth of global digital networked infrastructures and the range of instrumentation options they provide, allow for the experimental (re-)drawing of boundaries that transcend the local activity systems (of schooling) and their particular histories. This is a powerful means and potential instrument for change that seems to be still underused in higher education. In the intervention studies that were carried out as part of the international iCamp project, for example, we altered the local contextual constraints by drawing new inter-institutional, inter-disciplinary, and inter-cultural boundaries. This allowed for the creation of more "authentic" challenges that seemingly supported the viability and acceptance of the boundary judgements (shift to learning activity with open/undefined objects, instruments, community boundaries, regulative patterns, and so forth) that were underlying our interventions. That these means can be successfully used even within small-scale intervention contexts was validated in some of our work at Tallinn University.

A considerable drawback of the overall inquiry was its inability to establish a system of inquiry and change within a particular institutional context over longer periods of time. This was largely due to structural constraints that dominated the main work contexts in which the inquiry was developed and carried out. However, one-time interventions are certainly not allowing for the establishment of more elaborate systems of collaborative inquiry and change that have the emancipation and development of learning activity as its object. So, from a curricular reform and redesign perspective it would be more than interesting to engage the same group of participants into a series of educational episodes that aim for the transition from teacher driven (unemancipated) learning activity to emancipated, digitally re-instrumented forms of learning activity (first order transformation), and finally even to the further experimental development of such networked emancipated learning activity (second order transformation). This certainly requires a more thorough implementation in a particular curricular and organisational context.

So, who should be particularly interested in this type of interventionist educational practise and curricular re-design? In general, all educational

practitioners who are interested in the development of cultural-historically new forms of learning within and beyond the digital transformation of global society.

Educational technologists that share the change intentions outlined in this thesis should rethink the notion of efficiency and control that drive much of the digital (re-)instrumentation in higher education. They should explore what type of digital instruments can be used or need to be developed to support this interventionist agenda. Of primary interest are instruments that could be used to create records of action, represent items of experience and personal systems of meaning, and support conversational-reflective modelling practises.

Curricular designers/leaders need to critically review the notion of standardisation and micro-management of instruction. They should increase the structural degrees of freedom for the establishment of educational episodes that radically shift the patterns of control. They need to allow for changing the contextual constraints in ways that make emergent, transformative change objectives feasible within a programme of study.

Facilitators/teachers who subscribe to the interventionist and developmental orientation promoted in this thesis need to become change agents who engage into a particular type of (transformative learning) activity that establishes learning activity itself as an object. This also requires the rather egalitarian participation within a collective subject engaging in the co-production of a developing learning activity. If facilitators pursue knowledge interests that reach beyond the particular context of their educational (intervention) practise they should embed their work within a broader system of inquiry and change, thus crossing the boundary into educational research practise.

5.2.2 Critical systemic intervention research in higher education: merging inquiry and intentional change

The unpredictability and complex dynamic of the ongoing digital transformation poses rather difficult conceptual and methodological questions regarding an appropriate organisation and orientation of educational research and development practise. Collectively we need to raise the question what type of knowledge can and actually should be build in educational research practise under the current cultural-historical circumstances. Within the methodological reflection presented in Part 3 of this thesis I have tried to outline that the notion of applied science reaches some obvious philosophical and methodological limits that become increasingly pronounced in the wake of the digital transformation. The exclusive focus on instrumental knowledge interests and the (partial) insistence on the principal potential for and feasibility of building (universal) instrumental-nomologic knowledge, modelled with simple cause-and-effect relationships, is highly problematic for educational practise and the use of educational technology.

That something can actually be done with a particular technology or a

particular digital instrument can never be a (value-)rational argument for why it should be done in the first place. The face-validity of contemporary technological solutions (or promises) often results in their uncritical adoption and the mere reincarnation of established patterns of control and power. The gift wrapping approach in which digital instruments are "merely wrapped around old frameworks for education" (Fischer & Scharff, 1998, p. 6) is well and alive. Noble (1998) warned us more than a decade ago that the dominating form of digital (re-)instrumentation of higher education "…is not a progressive trend towards a new era at all, but a regressive trend, towards the rather old era of mass production, standardization and purely commercial interests…" (p. 1). Since good parts of the global formal higher education system have been modelled (or re-modelled) as an activity system of schooling it comes as little surprise that digital (re-)instrumentation has primarily focused on teaching activity (and administration) and on learning activity mostly in its dependent and unemancipated form. That the introduction of centralised and institutionally controlled digital platforms is not necessarily producing only benefits for the alleged key stakeholders in higher education was also summarised by Noble (1998):

> With the commoditization of instruction, teachers are drawn into a production process designed for the efficient creation of instructional commodities, and hence become subject to all the pressures that have befallen production workers in other industries undergoing rapid technological transformation from above. In this context faculty have much more in common with the historic plight of other skilled workers than they care to acknowledge. Like these others, their activity is being restructured, via the technology, in order to reduce their autonomy, independence, and control over their work and to place workplace knowledge and control as much as possible into the hands of the administration. As in other in other industries, the technology is being deployed by management primarily to discipline, de-skill, and displace labor (p. 5).

A similar account of the side-effects of this type of digital (re-)instrumentation could be easily formulated for students and their learning activity (or self-production). However, educational research, and research on educational technology in particular, rarely tackles value-rational questions and concerns in an upfront and transparent manner. Who is actually likely to benefit? What are the likely side-effects of particular technological solutions? What happens if we are not introducing a particular type of technology? These are only some examples of the type of questions that are generously ignored and avoided. By contrast, this thesis suggests that educational research and development practise should explicitly cater to a combination of practical-phronetic (why should we intervene at all?), instrumental-heuristic (how should we go about it?) and developmental- emancipatory (how do we support further self-improvement, growing autonomy, and so forth, through our intervention?). In fact, it proposes to embed instrumental-heuristic knowledge claims into systematic practical-phronetic and developmental-emancipatory deliberations.

The methodological implications of such an orientation was mainly discussed in Part 3 of this thesis and finally condensed into a rough outline of a *critical systemic intervention research approach*. This approach promotes the formation of a merged (or overlapping) system of inquiry and change that is anchored in a teleological rationale. The formation of such a system of inquiry and change is driven by a deliberate delineation of an initial system of concern through a set of explicit boundary judgements (which always have to be contextually grounded and can never be universal). Furthermore, it requires the formulation of an explicit change intention (type of change, object of change, direction of change, and so forth). The proposed boundary judgements and distinctions need to be subjected to some form of boundary critique, or at least made so transparent and explicit that such a critique becomes possible in principle. This probably requires new forms of "pragmatisation" that go beyond the guiding questions that Ulrich (1994) formulated within his framework of critical systems heuristics.

The expanding instrumentation options that social media provide should be an interesting field of exploration and experimentation in this regard. We urgently need to find new ways to expose our boundary judgements to public critique already in the early stages of intervention research. I consider this to be a promising potential direction for further methodological reflection and development. The established means and rhythms of scholarly publication and critique are certainly a rather inadequate instrument for mediating the type of critique that would be necessary and desirable within the digital transformation.

Critical systemic intervention research also requires the formation of a collective subject of inquiry and change. In concrete terms this requires that interventionist researchers become part of a collective subject of inquiry and change that also includes facilitators and participants. Thus, traditional boundaries between these actors dissolve. The selection, development, and validation of all proposed (conceptual, technical, and so forth) instruments for change need to be embedded into the rationale of the overall system of change that is getting formulated. Critical systemic intervention research intentionally leaves some "room" for improvisation and the introduction or invention of completely new instruments within the boundaries of the system of inquiry and change.

As a consequence of such a methodological rationale the knowledge claims that can and should be made are of a form and nature that differs from the "ideals" that allegedly drive the mainstream, applied science approach in social science. They require alternative concepts of quality, success, generalisation, and so forth. This is another area of further deliberation and methodological development that this thesis implies.

5.2.3 The cultural-historical school of thought and the next generation of activity theory

The particular focus of this inquiry lay outside the range of convenience of the

dominant conceptualisations of learning activity within the cultural-historical school of though. The strand of theorising that has been produced in the field of educational psychology has put an emphasis on the initial formation of learning activity within an activity system of schooling. It apparently conceptualises learning activity as closely coupled to a corresponding (and rather dominating) teaching activity. The other strand of theorising is coming out of research on activity systems of work and conceptualises learning activity as a specific form of transformative development of activity systems from within.

Both perspectives, however, do not provide adequate conceptual means to describe a system of inquiry and change that focuses on the emancipation and further development of individual|collective learning activity (in itself) within the digital transformation. The unfolding digital transformation of society catalyses deep structural changes and new formations of activity and activity systems of all kinds. Theorising (about human activity) that presupposes established (or even institutionalised) activity systems as a point of departure runs the risk of providing conceptual instruments that seem less and less adequate for grasping phenomena like the emergence of cultural-historically new forms of learning in the digital networked society. What seems to be necessary is a critical review of how individuals and collectives actually relate to and interface with established and institutionalised activity systems. Global network infrastructure provides an increasing amount citizen with ample opportunities for experimental (re-)drawing of boundaries and the formation of new activities and activity systems that do not necessarily carry a long (local) history of development and are thus not held together by well-defined, shared objects. While it doesn't look like institutionalised activity systems with relative long developmental trajectories and rather stable structures and objects will disappear anytime soon, there is good reason to expect the emergence and formation of more ad-hoc (or proto-) activity systems and experimental social practises with shorter life-cycles within the digital transformation. The emergence of such ad-hoc activity systems (or rather networks?) require the gradual "translation" of loosely-coupled, overlapping (but not identical) individual interests into shared (proto-)objects that get formed in digitally mediated (inter-)action. Theorising in the cultural historical school of thought needs to respond to these looming transformative processes.

In recent years Engeström and his collaborators have made an explicit effort to address digitisation and networking phenomena in their conceptual work. Engeström, for example, has introduced the notion of runaway objects, co-configuration work, knotworking, wildfire-activities, and mycorrhizae activities. The, so called, third generation of activity theory, however, is still "built on the idea of multiple interacting activity systems focused on a partially shared object" (Engeström, 2009, p. 307). While he seems to agree that the digital transformation "…prompts us to rethink the shape of activity systems. Third generation activity theory still treats activity systems as reasonably well-

bounded, although interlocking and networked, structured units" (Engeström, 2009, p. 309). In digitally mediated co-production, however, the boundaries and structures of activity systems regularly get blurred or disappear entirely.

Part of the work that is presented in this thesis implies that cultural historical activity theory needs to react (conceptually and theoretically) to the emergence of cultural-historically new forms of learning in the digital transformation. The descriptive concepts that are currently emerging in the context of developmental work research seem to hold some potential in this regard. I believe that the type of emancipated, networked learning activity that was projected as a plausible direction for intentional change and development in this thesis can be described in terms that are rather compatible. Emancipated learning activity, however, calls for a closer examination of developmental moves between its individual and collective manifestations. In a similar vein Miettinen (2005) calls for studies that try to understand "...the rich dynamics of the involvement of individuals in collective activities and their contribution to the transformation of these activities" (p. 65), while Lektorsky (2009) reminds us that "...an individual subject cannot be dissolved into the system of collective activity. The individual is a specific system of its own" (p. 80).

However, there is good reason to believe that emancipated, networked learning activity is increasingly oscillating between individual and collective forms of realisation. It might also show a weaker tendency to stabilise (or even institutionalise) over longer periods of time than earlier forms of learning activity. It can be coupled to a wide range of activities or activity systems and can cross already existing boundaries rather effortlessly. The options for drawing new experimental boundaries that cross local activity systems and their particular histories through (inter-)action are mediated by digital networked instruments and infrastructures. It allows for a type of individual and collective (self-)production and agency that is not entirely dependent on the enculturation in existing activity systems. In a networked world "… everything - and everyone - around us can be seen as resources for learning…" (D. Thomas & Seely Brown, 2011, p. 32), and can be turned into an instrument for mediating learning activity. The focus on structurally stable and well-bounded collective activity systems that still characterises a good part of contemporary research within the cultural-historical school of thought needs to be expanded and reconciled with the growing empowerment of individual agents and newly formed (small) collectives in the digital era. This might also require moving attention away from the modelling of existing (local) activity systems and their historic development to the experimental and explorative formation of new, digitally mediated activity systems of learning and (self-)production based on alternative forms of agency and co-ordination. In his recent outline of the possible next future of activity theory Engeström (2009) proposes, for example, to treat negotiation as one of these alternative forms of co-ordination that seem to gain importance:

> Negotiation is a central coordinating mechanism of the distributed agency required in knotworking within social production. Negotiation is required when the very object of the activity is unstable, resists attempts at control and standardization, and requires rapid integration of expertise from various locations and traditions. Negotiation is more than an instrumental search for a singular, isolated compromise decision. It is basically a construction of a negotiated order … in which the participants can pursue their intersecting activities (p. 315).

The formative development of emancipated and networked learning activity that is promoted in this thesis offers interesting opportunities to further explore this line of empirical and theoretical work.

5.2.4 The networked personal adult learner: resistance, creative defiance, and experimental (self-) development of learning activity

Finally, this thesis also holds some potential implications for the individual adult who finds herself in the role of the "learner" within contemporary higher education. Given that we are in an early transitory phase of an accelerated societal transformation driven by global digitisation and networking, a rather wide range of developmental trajectories and speeds on all systemic levels has to be expected. Established activity systems and their agents regularly try to preserve and re-produce the current state of affairs under these conditions. Thus, digital networked re-instrumentation of the core activities that define and hold together existing systems of teaching and studying often reflects such a defensive orientation and a perceived need for maintaining existing patterns of control and power distribution.

Some of the conceptual and analytical instruments that are presented in this thesis can certainly be used by an individual adult (learner) to diagnose within her particular institutional and curricular setting if the emancipation, further development and digital (re-)instrumentation of learning activity is systematically supported. If the digital instrumentation that is promoted by the institution and its representatives predominantly serves the needs of the educational system and its core activities of teaching and administering, then adults should by all means try to actively resist. They should not allow the institution and its agents to reduce them to mere consumers of pre-defined and institutionally owned instruments. Instead, they need to take responsibility for their own (self-)production through increasingly emancipated forms of learning activity and its digital instrumentation and augmentation. Thus, they should demand open types of "courses" or educational episodes from the institution (such as the format of the independent study that can be found in some curricular contexts in US American higher education) and the formation and execution of personal and inter-personal learning projects that are driven by individual interests and purposes. Such projects should be used to experiment with new, emancipated forms of individual and collective learning activity and the (self-)formation of personal and distributed networked learning environments. Regardless of what a given institutional setting might provide or

even demand, the technological infrastructure for taking such individual actions is basically there and continuously expanding. There is a growing array of affordable networked tools and services available that make it possible to move individual|collective learning activity (in form of projects) into the digital realm where it can gradually form into new activity systems with shared objects over time. There are more and more options for the digital mediation and representation of personal resources and the instrumentation and augmentation of conversational reflective practises such as making and sharing records of actions, items of experience, reflections, as well as products and outcomes of activity. In addition, the boundaries of local communities can be systematically expanded and re-drawn. The same holds true for the boundaries of the formal educational activity system and other activity systems an adult learner might belong to.

Altogether, the networked personal adult learner does not have to surrender to the particular level of development and digital instrumentation that a local system of higher education might display. There are countless ways one can engage into acts of resistance, creative defiance, and the experimental (self-)development of learning activity that potentially contribute to the formation of cultural-historically new and more adequate forms of learning within the unfolding digital transformation.

> So research as a kind of reflection on human activity can change its objects. But this can happen only when there is not only research, but also a project of changing the existing activity and generating a new one. This means that human beings who are the object of research, as a kind of reflection, accept the results of research and suggested modes of transforming the activity, make a new mediation of their activity, and so change it. If the results of research are unknown to human beings who are under investigation, or if they do not accept these results, or if a researcher cannot suggest any project for generating new activity, the object of research does not change (Lektorsky, 2009, p. 87).

I sincerely hope that the suggested project for transforming learning activity in higher education presented in this thesis can find the necessary level of acceptance to bring about some change.

6 References

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7 The original Publications